Solid Waste in Washington State

22nd Annual Status Report

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Solid Waste in Washington State

Twenty-Second Annual Status Report

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Chapter 1: Issues Facing Washington State

Budget

Continuing Impacts to Ecology's Waste 2 Resources Program from the Waste Reduction, Recycling and Litter Control Account Reductions

The Waste Reduction, Recycling, and Litter Control Account (WRRLCA) is a major funding source for the Waste 2 Resources (W2R) Program for litter prevention and pickup programs, as well as waste reduction and recycling program eligible for funding under RCW 70.93.180(1)(c).

In July 2010, WRRLCA funding was reduced by $4 million. Several activities were suspended at that time.

In July 2011, funding from WRRLCA was reduced by $7 million. Proviso language placed limitations on how the W2R Program could spend the remaining funds. The W2R Program suspended or reduced activities to meet requirements of the proviso. The $7 million fund reductions in WRRLCA also resulted in suspension of several additional activities and redirection of existing staff work. Some of this work was also suspended in Fiscal Year 2010-11 because of that biennium's $4 million reduction. See *Solid Waste in Washington State 20th Annual Status Report, Publication #11-07-039*, for additional details.

In July 2012, an additional $1.7 million reduction and restrictions on work using WRRLCA funds were imposed on the Washington Department of Ecology (Ecology). Ecology was required to only fund litter collection programs from the account. One-time savings were achieved by eliminating several eligible waste reduction and recycling programs. Funding was restored for organics and composting work using the State Toxics Control Account on a one-time basis. This funding allowed for the continued work to evaluate odor issues at composting facilities. See *Solid Waste in Washington State 21st Annual Status Report, Publication #12-07-074*, for additional details.

In July 2013, $10 million in WRRLCA revenue was diverted to the State Parks Renewal and Stewardship Account for maintenance of state parks in the 2013-15 and 2015-17 biennia. Because of this continued WRRLCA reduction, some specific Ecology activities are still suspended.

Litter Pickup Programs

Ecology is prioritizing litter pickup efforts through the Ecology Youth Corps (EYC) and partnerships with the Washington State Department of Corrections (DOC), Department of

Natural Resources (DNR), and local governments. This is done through the Community Litter Cleanup Program (CLCP). Reductions taken to other Ecology funding will mean fewer crews on county roads and public lands, and fewer miles covered for litter pickup. Expected results will be dirtier and potentially more dangerous roads.

Other specific litter related activities are either still suspended or have received reduced funding:

- Ecology's litter prevention campaign and the litter survey are suspended. Surveys had shown a 25 percent reduction in litter because of the prevention campaign.
- The Washington State Patrol's emphasis on secured load requirements is suspended.
- The litter hotline where citizens could report observed littering is no longer in service, resulting in less education and outreach to the public.
- Funding reductions to the CLCP continue, resulting in increased litter on county roads.
- Funding for litter pickup through interagency agreements with Washington State Parks and the Washington Department of Fish and Wildlife is suspended. The result is increased litter on public areas, state lands, recreational areas, and increased illegal dumping.

Waste Prevention and Recycling

Ecology also works on many different issues that deal with waste prevention and recycling. Because of WRRLCA fund reductions, some specific activities are still suspended:

- The School Awards Program is suspended, resulting in fewer incentives for exceptional waste reduction and recycling efforts in schools.
- Staff for the 1-800-RECYCLE hotline was greatly reduced.
- There is no funding for a statewide waste characterization study.

We are prioritizing our technical assistance to support work on priority waste streams as discussed below.

Organics Management

Organic materials, including yard waste, food waste, land clearing debris, and construction and demolition debris, have historically been a significant portion of the waste stream. To meet the *State Solid and Hazardous Waste Plan* (*Beyond Waste)* goal of closed-loop recycling and reuse of organic materials, those materials are being diverted from disposal to other management options. Some of the management options have associated concerns.

In major population centers of western Washington, there has been an increased demand for landfill diversion options for organic wastes like residential yard debris and food wastes. Local governments and waste management companies have responded with increased collection and diversion programs. Unfortunately, the infrastructure to support increased collection is inadequate. The result is an overburdened compost industry with odor problems and excess product supply.

To address these issues, Ecology is providing technical assistance to jurisdictional health departments and compost facility owners to alleviate some of the problems. We revised rules in 2013, *WAC 173.350.220 - Composting Facilities*, to address feedstock, materials management, odor issues, and conditions for exempt compost facilities to improve organics management. Ecology is also working with local governments in their planning process to encourage them to evaluate the presence of adequate facility infrastructure to handle organic materials before they implement the collection programs.

Anaerobic digestion is also a proven technology that converts organic matter to biogas in the absence of oxygen, with nutrient rich fiber and liquid as byproducts. As part of the rule revision process last year, a new section, *WAC 173.350.250*, was developed to address anaerobic digesters.

Reducing and Recycling Materials from Construction

In addition to providing support to local government on curbside recycling programs, Ecology is also focusing our technical assistance efforts on reducing and recycling materials related to the construction industry. This involves using less material in the construction process, reducing the use of toxic building materials, and recovering more through deconstruction, reuse, and recycling of the construction and demolition (C&D) debris.

C&D debris makes up about 25 percent of the waste stream. Reducing, reusing, and recycling this material not only keeps it out of landfills, it reduces greenhouse gas emissions and creates needed jobs and economic stimulation. Ecology will focus efforts to ensure that C&D debris collected for recycling is sent to the appropriate facility and is recycled, not disposed.

Reducing and Recycling Plastics

Ecology will work with stakeholders to promote plastic products recycling. As of 2011, plastics made up 12.3 percent of the waste stream, up from 9.9 percent in 1992. Plastic bags make up 5.4 percent of the total plastics disposed.

Updating the State Solid and Hazardous Waste Plan (the Beyond Waste Plan)

Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling, directs Ecology to develop a solid waste management plan as a guide to carry out a state coordinated solid waste management program (*RCW 70.95.260*). Ecology developed the first state plan in 1972, and revised it in 1980 and 1991. In 2004 Ecology issued the current State Solid and Hazardous Waste Plan (Beyond Waste).

Washington is required to review and update the state plan regularly. The first update was completed in October 2009. In fall 2013, we began working on the next state plan update. As a first step in this process, before we drafted any content, we contacted stakeholders including local governments, waste and recycling companies, environmental organizations, other state agencies, and others, to get their ideas on how to make the plan most useful and seek advice about the update process.

The many comments we received will be used to generate first draft recommendations, which will be available for public review and comment in 2014. These comments will then be considered as we create a second draft, with one more cycle of review and input before the plan update is complete.

Goals for the update include increased focus on the current waste management system and the diversity that exists across the state, while maintaining the Beyond Waste Plan vision to reduce and eliminate most waste and toxics, using any remaining wastes as resources.

See Chapter 2 for more details. To be kept informed on the plan update process, join the listserv (http://listserv.wa.gov/cgi-bin/wa?A0=WA-STATE-WASTE-PLAN) and visit the plan update website (www.ecy.wa.gov/wasteplan).

Regulatory Changes in Washington

Solid Waste Handling Standards Rule Update

In November 2013, the W2R Program formally announced it would update *Chapter 173-350 WAC – Solid Waste Handling Standards*. Sections of the rule pertaining to organics management (220, 225, and 250) were adopted in spring 2013 following a process that began in 2009. In 2010, an update of the whole chapter was put on hold under former Governor Christine Gregoire's Executive Order restricting agency rule making. Only the organics sections moved forward. The new update will focus on the remaining sections of the rule. Ecology is not proposing further amendments to the organics sections at this time.

Ecology will revisit issue papers and summaries developed following previous stakeholder work, and renew efforts to work with stakeholders. Issues identified as priorities include updating definitions, clarifying criteria for inert waste classification and when earthen material/soil is a

solid waste, and streamlining recordkeeping and reporting requirements. In this general update, Ecology will address other issues that may result in substantive changes, as well as clarifications and corrections to language in the chapter not expected to change the overall effect of the rule.

Local health authorities (LHA) adopt ordinances that meet or exceed state program requirements, and have the lead for implementing the requirements of state solid waste rules through local permitting processes. Solid waste management is largely a partnership between public agencies and the private sector. Operators are a mixture of public (mainly public works departments) and private (haulers, recyclers, disposers) interests.

Ecology will solicit and evaluate recommendations of ad hoc committees comprised of internal staff and stakeholder representatives including local health authorities, and solicit feedback from stakeholders through both informal and formal public processes. Ecology will involve stakeholders by keeping them informed using various communications tools with a heavy emphasis on a ListServ (http://listserv.wa.gov/cgi-bin/wa?SUBED1=ECY-SW-HANDLING-STANDARDS&A=1) established for this purpose.

Ecology will also use e-mail, newspaper notices, notices to trade journals, a website with rule update information, notices on the agency public events calendar, notices sent through the WACTrack ListServ, and informal and formal stakeholder meetings and hearings. We will periodically brief the Waste 2 Resources Advisory Committee and statewide environmental health directors.

At this early stage it is difficult to project dates with great confidence. Following is a proposed timeline:

Rule-making announcement (CR-101 filing)	November 6, 2013
Proposed rule available for public comment (CR-102 filing)	June 2016
Final rule adoption (CR-103 filing)	November 2016
Rule effective date	December 2016

Encouraging Producer Responsibility in Washington

E-Cycle Washington – a Success Story

E-Cycle Washington, the state's electronic product recycling program, has been in operation for five years. It continues to set a new record collection rate every year. In 2013 another high watermark was set when 46 million pounds of TVs, computers, monitors, e-readers, and portable DVD players were collected for recycling. In the five-year life of the program, more than 200 million pounds of these devices were prevented from going to landfills where the toxic materials they contain like lead, cadmium, and polybrominated flame retardants could eventually be released to the environment. More than 13 million pounds of lead alone have been recycled through the program instead of going into landfills.

E-Cycle Washington is the state's first manufacturer funded product stewardship program and its success is nationally recognized. There are 25 states that have types of e-cycle laws and Washington is consistently one of the highest performers. In 2013, Washington consumers recycled 6.7 pounds of electronics per person in the state. This high per capita rate is made possible in part by the convenient statewide collection network of more than 330 free dropoff sites for used electronics. More than half of these sites are reuse oriented charitable organizations that put thousands of the fully functional electronics they receive through E-Cycle Washington back into use through the secondary market. See *Chapter 2 - Partnering for the Environment* for more details about the E-Cycle Washington Program.

Mercury-Containing Lights Product Stewardship Program

The 2010 Legislature adopted *Chapter 70.275 RCW, Mercury-Containing Lights - Proper Disposal.* The law requires producers of mercury-containing lights sold in or into Washington State for residential use to fully finance and participate in a take-back program, effective January 1, 2013. Producers of mercury-containing lights were to fund Ecology's administration and enforcement costs.

Ecology formally proposed rules for the new stewardship program in June 2012 and held public hearings in August. Ecology's Director adopted the new rules on November 16, 2012. The rules became effective on December 17, 2012.

Light-cycle Washington is the mercury-containing lights product stewardship program "brand." The Light-cycle Washington Program was not operational on January 1, 2013, because a lawsuit about funding the program was filed against the rule and delayed implementation of the program. The industry is proposing legislation for the 2014 Legislative Session to eliminate the state contracted program and allow for producer funding options to include using an "eco fee." If the Legislature approves the changes, the lawsuit will no longer be necessary and the program can be implemented.

The program's status will be regularly updated on Ecology's website. Additional information is available at:

- Light-cycle Washington website: www.walights.org
- Ecology website: http://www.ecy.wa.gov/programs/swfa/mercurylights/
- Ecology publication: https://fortress.wa.gov/ecy/publications/publications/1207064.pdf

Issues with Used Oil Collection Programs

The City of Tacoma is reviewing proposed changes to their city-wide used oil collection program that serves households after receiving an Environmental Protection Agency (EPA) fine and decontamination costs.

The City shipped 750 gallons of used oil contaminated with Polychlorinated Biphenyls (PCBs) from the city's Do-It-Yourself used oil tank at the transfer station to Emerald Services, an oil recycling and waste management company. Because the oil passed the Chlor-D-Tect test, the City did not suspect that the used oil was contaminated with PCBs.

Emerald Services found the problem during routine oil testing that revealed PCB contamination over 50 ppm, triggering provisions of the Toxic Substances Control Act (TSCA). The PCB contaminated oil in Emerald's tank was traced to Tacoma.

Emerald Services provided a waste report to EPA required by federal regulations describing the PCB waste. Under TSCA, EPA considered the violation to occur at the time Emerald pumped the oil out of the city's tank, even though the City and Emerald were not aware of the contamination until several days later when the laboratory test results were available. Because the contamination was traced to Tacoma, EPA issued a three-part violation to the City of Tacoma:

- Failure to notify EPA of PCB waste activities.
- Failure to prepare a PCB waste manifest.
- Distribution of PCB into commerce.

It is important to note that the violations were administrative. No PCBs were released into the environment. The City of Tacoma settled with EPA, paying a fine of $40,000. Because the contamination was not discovered until after it had been pumped into Emerald's bulk tank, the City became liable for approximately 8,250 gallons of contaminated oil that could not be recycled. The City had to pay for disposal of the contaminated oil as hazardous waste, as well as the costs for decontamination of the tanks (Tacoma's and Emerald's).

In response to this incident, the City of Tacoma is now re-evaluating their used-oil collection program. The first step is to implement a rigorous sampling and testing program that will involve shutting down a collection tank and not sending oil to a third-party vendor until laboratory tests confirm no contamination. A second tank will be made available while awaiting test results. The second step is to close offsite tanks that the City operates in conjunction with local businesses. These offsite tanks will have to be closed due to the cost and practicality of installing second tanks, and the increased operational cost of sampling and testing oil from these offsite locations. The City estimates that 60-percent of the used oil collected comes from these offsite locations. Where that oil will now go is unclear.

The changes that the City of Tacoma is considering are in direct response to the regulatory liability used oil collection programs face under TSCA. As more jurisdictions consider this liability and EPA's enforcement stance, broad changes to the state's used oil collection and recycling infrastructure could occur. Ecology is committed to working with EPA, local governments, and used oil processors to ensure regulatory compliance while preserving the used oil collection infrastructure that has successfully kept millions of gallons of used oil from entering the environment.

Chapter 2: Partnering for the Environment

Building strong partnerships underlies the success of Ecology's Waste 2 Resources (W2R) Program. The W2R Program encourages effective partnerships with businesses, local governments, community organizations, other state agencies, the agricultural community, and industry groups across the state. By working together, groups can offer their unique perspectives and resources to move toward an economically, environmentally vibrant future in Washington.

Time to Update the State Solid and Hazardous Waste Plan (Beyond Waste Plan) – *Partner Participation Needed!*

Chapter 70.95 RCW, *Solid Waste Management – Reduction and Recycling*, directs Ecology to develop a solid waste management plan as a guide to carry out a state coordinated solid waste management program (RCW 70.95.260). Ecology developed the first state plan in 1972, and revised it in 1980 and 1991. In 2004, Ecology issued the current combined State Solid and Hazardous Waste Plan, the Beyond Waste Plan. The vision and goals were developed with the input of numerous stakeholders and partners. The first five-year update was completed in October 2009, which made minor changes. We are now working on the next five-year update, which is due in 2014.

The Beyond Waste Vision

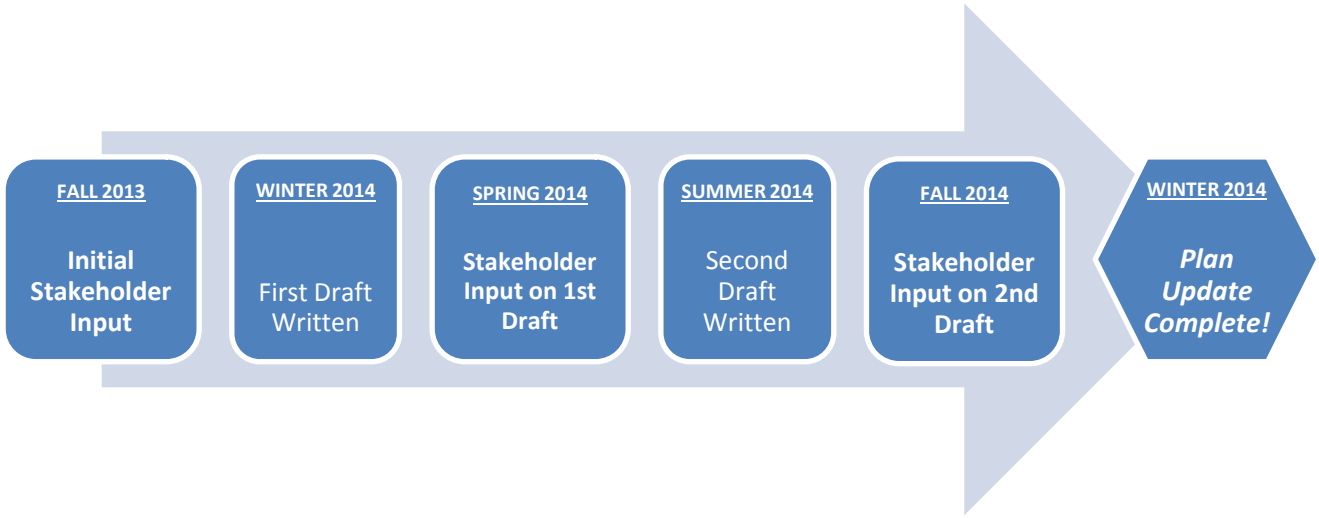
We can transition to society where wastes are viewed as inefficient and most wastes and toxic substances have been eliminated. This will contribute to environmental, economic, and social vitality.

Our goals with this plan update are to represent the statewide system in all of its diversity, make the plan more user friendly, and stay on track to achieve the vision of reducing waste and toxics, while safely managing what waste remains.
Ecology began the update process in the fall of 2013. Before we put pen to paper, we asked for stakeholder input on some broad questions:

- *What do you need in the state solid and hazardous waste plan to make it most useful for you?*
- *Thinking of an ideal solid and hazardous waste management system, statewide or in your area, what are some key elements and actions to include in the plan update, especially for the next five years?*
- *Do you have any overall advice for the Department of Ecology for this plan update?*

At the time of this writing, we have met with more than 30 groups and received additional comments through the use of an online survey tool from about 50 respondents, totaling more than 100 pages of comments. Ecology will use these comments to help draft new recommendations for the plan update, which will then receive additional stakeholder review and input. Figure 2.1 depicts the general timeline of the complete plan update process, which will include three opportunities for stakeholder input and comments.

Figure 2.1
Solid and Hazardous Waste Plan Update Timeline



To stay informed about the plan update, join the listserv at http://listserv.wa.gov/cgi-bin/wa?A0=WA-STATE-WASTE-PLAN and visit the website. www.ecy.wa.gov/wasteplan.

Implementation of the State Solid and Hazardous Waste Plan (Beyond Waste Plan)

Meanwhile, work on the current Beyond Waste state plan continues. The W2R Program implements many aspects of the solid waste portion of the state plan, and coordinates with the Hazardous Waste and Toxics Reduction Program on other portions of the plan. While legislative funding restrictions preventing Ecology's work on some plan elements were removed as of June 30, 2013, the W2R Program is still working under budgetary and staffing cuts that considerably reduce its work capacity. Some of the work Ecology and our partners were able to accomplish is listed below for each initiative.

Why Beyond Waste?
Avoiding wastes and the use of toxic chemicals is the smartest, cheapest and healthiest approach to waste management.

- **Reducing Small Volume Hazardous Materials and Wastes**

  - Work on implementing the mercury lights product stewardship program continued, but due to a lawsuit by the light manufacturers, a program is not yet operational.

  - A new Green Janitorial Supplies contract was adopted in Washington and Oregon for use by government agencies. A series of white papers on green purchasing opportunities were written with funding by the National Association of State Procurement Officials. Both of these efforts were worked on in partnership with the Department of Enterprise Services.

- The paint industry worked with Washington stakeholders to bring paint product stewardship legislation to Washington in the 2013 Legislative Session and plans to resubmit it in 2014.

- The E-Cycle Washington product stewardship program celebrated five years of operations, with more than 200,000,000 pounds of computers and televisions collected and recycled or reused.

- **Increasing Recycling of Organic Materials**

  - In 2013, Ecology completed rules designed to improve organics recycling. They are now being implemented.

  - Ecology and the Washington Organics Recycling Council held another fully attended, successful compost operator training course.

  - Washington State University's research continued on alternative uses for organic materials, but at a reduced rate due to budget cuts.

  - Research is also underway on odors at compost facilities.

- **Making Green Building Practices Mainstream**

  - This initiative has continued its focus on construction and demolition debris, and toxic building products. However, there are now two completed Living Buildings in Washington State, with many more underway.

  - In cooperation with roofing manufacturers, Ecology conducted a study on runoff from various roofing materials. A second stage is set for 2014.

  - Ecology staff is more closely tracking and monitoring registration of transporters of construction and demolition debris, as well as other recyclable commodities.

- **Current Issues with Solid Waste**

  - The Northwest Region Recycling Workgroup is well underway in their study of co-mingled recycling issues. They are building on similar work done by the Southwest Region Recycling Workgroup that resulted in best management practices for curbside recycling.

  - Grants and planning assistance for local government continued to be provided for waste reduction and recycling, in support of the ideas and direction of the Beyond Waste Plan.

- **Measuring Progress**

  - The Beyond Waste Progress Report provides important performance measures for our program, local government, industry, and others. Indicators are now being updated as new data becomes available, instead of just once a year. The Progress Report is available at www.ecy.wa.gov/beyondwaste/bwprog_front.html.

  - A recycling destination and use study has been planned and data will be collected in early 2014.

Partnering for the Environment through Sustainable Building Practices

In 2011, the Legislature reduced funding and placed limitations our general green building work with proviso language. The W2R Program currently has two staff that are focusing efforts on the sustainable management of building materials in two key areas:

1. Optimum resource management within the construction industry;

2. Elimination of toxic substances from building materials & waste.

Promoting Effective Building Materials Management

There are a number of avenues open for making positive changes in commercial and residential design and construction practices, so that construction and demolition (C&D) materials are specified and handled with greater care. Building awareness of these practices is the first step.

Bringing DECON 13 to Washington

W2R staff built a team of government and industry partners to win the bid to bring DECON 13, a national biennial conference dedicated to deconstruction and building material reuse, to Seattle. King County Green Tools, the City of Seattle, Second Use, Reuse Consulting, and the Northwest EcoBuilding Guild joined Ecology to contract with the Building Materials Reuse Association, based in Chicago to organize and hold the conference at the Seattle Center.

Industry leaders from across the country descended upon Seattle to present on topics that included:

- ✓ *Product Stewardship - A Focus on Carpet*

- ✓ *One Nail at a Time: Building Deconstruction Law as a Tool to Demolish Abandoned Housing Problems*

- ✓ *Divert more Construction & Demolition Waste from Your Renovation Projects*

- ✓ *Rethinking LEED MR Recycling: Time to Recycle this Credit, NOT Reuse it*
- ✓ *The use of Low-Value Materials from C&D Recovery*
- ✓ *A Life-Cycle Approach to Reducing Residential C&D Waste*

Revising a Website

Staff is working on revising the former Green Building website to provide information on and links to deconstruction resources, best management practices for construction materials, and salvage and reuse opportunities.

Building a Materials Flow Map

Staff is also continuing efforts to create an interactive map of C&D facilities and their corresponding material flows for public use. When ready, this challenging endeavor will be posted to the new website. Development is expected to take a few more years.

Public Involvement Presentations and Educational Outreach

Staff gave presentations to groups region-wide and at conferences; facilitated public involvement meetings; and developed workshops to train organizations and individuals new to C&D and effective materials management.

Following are public outreach and collaboration efforts undertaken with various organizations and jurisdictions in the last year:

- *Cascadia Community College Curriculum Development.* With other knowledgeable professionals, staff assisted in developing the curriculum for the first Bachelors of Applied Science in Sustainable Practices for Cascadia Community College in Bothell.
- *Edmonds Community College.* Staff presented a lecture on Building Codes and Change.
- *EcoBuilding 2013: Building Bridges, Pushing Boundaries.* Staff gave presentations on Toxic Chemicals in Roof Runoff and practical processes of stakeholder engagement and participatory Leadership.

Inspections of C&D Recycling Facilities

Staff assisted in field inspections of C&D recycling facilities to determine status and handling of materials diverted from landfills, and to verify processing practices.

Eliminating Toxins from Building Materials

The recent Puget Sound Toxics Loading Assessment (PSTLA) report identified arsenic, cadmium, copper, and zinc levels in the Puget Sound Basin. These metals can cause harm and death to fish and other aquatic life. Some can also adversely affect human health. The PSTLA report identified roofing materials as a significant potential source of release of these metals, and possibly polycyclic aromatic hydrocarbons (PAHs) and phthalate plasticizers into the Puget Sound.

Staff partnered with Ecology's Environmental Assessment Program (EAP) to conduct a Roofing Materials Assessment, funded through a grant from the National Estuary Program. This study intends to provide initial data needed to evaluate whether roofing materials are a potential source of toxic chemicals in the Puget Sound Basin. This study assesses the concentrations of select metals and organic compounds that run off of roofing materials during rain events. Actual roof systems include gutters and downspouts, HVAC systems, flashings, etc. This pilot study is only assessing runoff from specific types of roofing materials commonly used in the region.

A key element of the study has included partnering with members of the roofing industry including manufacturers, contractors, roofing associations, and members of the environmental community to provide comments and feedback on the study design, data, and interim and final results. The Roofing Task Force has included representatives from a wide variety of stakeholders including representatives from the following groups:

- Asphalt Roofing Manufacturers Association
- Cedar Shingle & Shake Bureau
- Copper Development Association
- Environmental community
- International Zinc Association
- King County
- Metal Construction Association
- Single Ply Roofing Institute members

Ecology received additional grant funding from the National Estuary Program and the Asphalt Roofing Manufacturers Association to conduct sampling of an additional ten storms over the 2013-14 winter. Results will be available in late summer 2014. More information can be found at http://www.ecy.wa.gov/programs/eap/toxics/roofing.html.

Public Support and Public Service

Public Service

Staff provided support to citizens and participated as members of nonprofit organizations.

Technical Assistance to Individual Citizens

As an ongoing service, staff responded to numerous requests for information, ranging from where to take waste materials to what types of roofing are best for rainwater harvesting during the reporting period.

Group Participation

Many organizations are instrumental in fostering Ecology's goals for sustainable building materials management across the state. A key part of our work is partnering with these organizations to further their activities with technical assistance, planning, and in-kind work, often as Board or Steering Committee members:

- Building Material Reuse Association (served as a member of the Board of Directors).
- Built Green® Washington.
- Construction & Demolition Recycling Association.
- Solid Waste Association of North America.
- Washington State Recycling Association.

Ecology partnered with others to reduce jurisdictional barriers to better construction and development techniques. We also expanded green networks, intergovernmental relationships and public-private partnerships to accomplish joint environmental goals. A portion of this work also involves working with permitted and exempt facilities that take construction and demolition wastes for processing and recycling.

Partnering for the Environment by Reducing Small-Volume Hazardous Materials and Wastes (Moderate Risk Waste)

Because of their pervasiveness and potential harm, reducing small-volume hazardous materials and wastes is a primary initiative in the State Solid and Hazardous Waste Plan. The goal of the initiative is to eliminate risks associated with products containing hazardous substances commonly used in households and in relatively small quantities by businesses. The state classifies this type of hazardous waste as moderate risk waste (MRW). For more information, see Chapter 5.

Historically, MRW programs have focused on developing infrastructure to collect and dispose of household hazardous waste and conditionally exempt small quantity generator waste (CESQG), with the goal of protecting human health and the environment. While several counties recently initiated new facility development, a majority of programs focus on operational issues, such as adapting to an evolving waste stream and securing necessary funding.

Ecology conducts many activities to ensure the proper management of MRW. Regional staff review and support implementation of local solid and hazardous waste plans. They provide technical assistance on regulatory compliance to local solid waste and health departments and facilities. They also administer grant programs that support MRW activities at the local level.

Collecting, processing, and providing disposition for MRW is expensive. Ecology, in partnership with local governments, has been exploring product stewardship and extended producer responsibility as a way to ease the financial burden of managing these wastes.

"Product stewardship" directs all those involved in the design, production, sale, and use of a product to take responsibility for minimizing the product's impact to human health and the natural environment throughout the entire life of the product. Extended producer responsibility is a mandatory type of product stewardship (often legislated) that at a minimum includes the requirement that producers take responsibility for establishing and financing a system to recover their products at their end of life.

Not only does product stewardship and extended producer responsibility shift the burden of end-of-life management from local governments to product manufacturers, it increases recycling of products, which reduces waste and conserves resources. Ultimately these programs can lead to product redesign, eliminating the use of toxic substances, or making a product more recyclable.

Ecology is currently responsible for implementing two extended producer responsibility laws: E-Cycle Washington for electronics and a program for mercury containing lights. In the 2013 Legislative Session, both the small rechargeable battery and paint industry brought forth legislation to create product stewardship programs for their products. Both bills failed. A paint bill is expected to be reintroduced in 2014.

We have become increasingly aware of the risk to human health and the environment when people *use* products containing toxic substances, not just when they dispose of them. Ecology is engaged in activities to eliminate use of toxic substances in products, making products "greener," thereby preventing the generation of small volume hazardous wastes in the first place. More information on these activities can be found in the Reducing Toxic Threats section of this chapter.

Reducing risks from MRW goes beyond safe handling and disposal. It is optimizing reuse and recycling. Ultimately, it is eliminating use of toxics in products and increasing use of safer products and services.

Partnering for the Environment by Reducing Toxic Threats

Reducing threats caused by historical and ongoing releases of toxic chemicals is the rationale behind many of Ecology's successful regulatory programs. But we are finding that cleaning up or managing these releases is not enough. These approaches are expensive and usually leave some contamination behind. More importantly, these regulatory programs largely focus on point sources, leaving non-point sources largely unaddressed.

New research is increasingly finding that timing of exposure matters as much as the dose, and that during certain very vulnerable times during development, very low levels of some types of toxic chemicals can cause serious harm.

Reducing toxic threats by preventing uses or releases in the first place is the smartest, cheapest, and healthiest approach. Increasing Ecology's investment in prevention strategies is the focus of Ecology's Reducing Toxic Threats (RTT) priority initiative, and a fundamental principle of the State Solid and Hazardous Waste Plan (Beyond Waste).

This RTT initiative, building on work already done at Ecology, is aimed at fostering development of prevention approaches to avert exposures to toxic chemicals, and avoid future costs that come when toxic chemicals find their way into people and the environment. The Legislature has passed a number of laws to limit certain chemicals in consumer products such as lead in wheel weights, Bisphenol A in baby bottles, and mercury in many products.

Another law impacting this work is the Children's Safe Products Act (CSPA) passed in 2008. Intended to address the challenge of insufficient data on how and where chemicals of concern are used, CSPA requires manufacturers to disclose their use of certain chemicals in children's products.

With resources at a premium, it will be increasingly important to keep expenses low and build on positive results achieved by Washington, as well as other jurisdictions. Ecology continues to work with several other states to develop ways to share data, influence federal policy reform, and establish a more standardized approach to identifying safer alternatives for toxic chemicals still in use.

Prevention strategies are not without their challenges, including:

- *Insufficient data.* Information on the presence of toxic chemicals in products is often not available. Information on toxicity is also often not available. Without this data it is difficult to evaluate risk.

- *Understanding how to consider lifecycle impacts*. Back-end consequences such as public health impacts or environmental cleanup costs are usually not factored into front-end design decisions. As a result, these costs are often disproportionately born by the taxpayer.

- *Lack of incentives and assistance to reduce toxics use*. Using fewer toxic chemicals in products is the surest way to avoid exposures and costly cleanups, but there are not enough incentives and assistance to do so.

- *Inadequate protections at the federal level*. Washington needs to continue to act because of the absence of an effective national system to provide consistent protections from toxic chemicals.

Ecology developed a work plan to address these challenges and focus our limited resources. The work plan includes the following elements:

- Implement the Children's Safe Products Act (CSPA), including product testing and enforcement of the law and rules.

- Apply the newly completed Alternatives Assessment Guide to identify alternatives to copper based boat paint. This work will allow us to compare the three decision frameworks in the Guide and provide information needed for the agency to comply with *RCW 70.300 - Recreational Water Vessels - Antifouling Paints.*

- Continue to focus on persistent, bioaccumulative, and toxic chemicals (PBTs), and implement the PBT rule. Explore how the PBT program might be accelerated or expanded.

- Identify priority chemicals of concern.

- Implement key recommendations of the Puget Sound Action Agenda to reduce impacts of toxics in Puget Sound.

Significant Accomplishments in the Last 12 Months to Reduce Toxic Threats

Children's Safe Products Act

Staff continues to reach out to manufacturers of children's products to assist in compliance. Agency compliance activities consist of purchasing and testing products. Ecology has issued a number of notices of correction to manufacturers when discrepancies between the reported information and the agency's results have occurred. The Reporting Rule (WAC 173-334) was amended to add one chemical and remove one chemical in response to petitions. The agency is now in the process of developing a database for product testing results. This database, which will have a public interface, will include data from compliance activities under the CSPA, as well as the Toxics in Packaging Law (RCW 70.95G), Brake Friction Materials (RCW 70.285), and PBDEs (RCW 70.76).

Toxics Loading Study

Ecology's Toxics Loading Study and the Toxics Assessment Report are complete. They were released to the public on November 4, 2011. The Assessment Report found that the polluted surface runoff from urban areas is the most significant source of toxic chemicals to Puget Sound.

The study addressed 17 indicator toxic chemicals in 9 different pathways for 4 different land uses. The study identified key sources of toxics including roofing materials, creosote treated wood, wood smoke, vehicle exhaust, petroleum drips and leaks, and urban pesticide usage. Actions to reduce these sources are underway.

Projects include:

- Work with a contractor and external advisory committee to establish a Green Chemistry Center in Washington. The Green Chemistry Center is envisioned as a public-private partnership, catalyst, and central point-of-contact that brings together businesses, higher education, government, and non-profit organizations to facilitate green chemistry applied research, development, demonstration, education, and technology transfer. The goal is to identify, fund, and conduct research projects that will help reduce toxics loadings of high priority chemicals in storm water and Puget Sound.

- Multiple scientific investigations to explore the impact of chemicals of emerging concern on fish in Puget Sound (Chinook and sole).

- Grants awarded to the Washington Department of Natural Resources and Pierce County Public Works to remove creosote pilings, a significant source of PAHs in the Sound.

- Grants to the Puget Sound Clean Air Agency (PSCAA) to enhance efforts to reduce wood smoke, which is a serious human health hazard and another significant source of PAHs to Puget Sound.

- Expanding the local source control program to additional jurisdictions. The local source control program provides technical assistance to small businesses to reduce the use of toxic chemicals and prevent polluted runoff from entering Puget Sound. New funding supports the distribution of spill kits and installation of secondary containment at small businesses.

- Collaborating with manufacturers of roofing materials to better understand how roofing materials contribute toxic chemicals to Puget Sound. The Puget Sound Toxics Loading Assessment identified roofing as a significant source of copper, zinc, phthalates, and other contaminants.

- Developing a landscaper certification program to promote sustainable land care, including reducing the use of pesticides, fertilizers, and air-polluting equipment. Ecology awarded a contract to Cascadia Consulting Group to develop this certification program in conjunction with state agencies, local governments, academia, nonprofits, and representatives from the landscape industry. The program is expected to be in place by late 2014.

- The Puget Sound Toxics Loading Assessment found that urban pesticide use was a leading source of copper. The Washington State Department of Agriculture (WSDA) is conducting a survey of homeowners and pesticide applicators to better estimate typical residential urban pesticide use. Results will drive future education and outreach efforts.

- Seattle Public Utilities and Ecology are coordinating hands-on workshops addressing vehicle leaks in and around Seattle. At the workshops, participants learn how to detect oil and other fluid leaks, identify the sources of the leaks, repair minor leaks, clean up spills, and properly dispose of auto fluids.

Chemical Action Plans for PBTs

The Chemical Action Plan (CAP) for polycyclic aromatic hydrocarbons (PAH) is complete. The recommendations largely focused on enhancing and augmenting existing programs to reduce the most significant sources as wood smoke, vehicles (emissions, tire wear, and drips and leaks), and creosote pilings. Work is currently underway to address these sources. Work also continues to implement the lead, PBDE, and mercury CAPs.

A CAP to address PCBs is currently underway and is expected to be completed by the end of 2014.

Next steps include examining if the PBT rule should be updated, as well as completing a CAP to address perfluorooctane sulfonates (PFOS).

Safer Alternatives & Green Chemistry

Preventing problems caused by toxic chemicals and reducing their use depends on transitioning to less harmful alternatives. Ecology led an eight state effort to develop more standardized approaches to identifying safer alternatives to toxic chemicals to ensure when toxic chemicals are phased out, they are replaced with better substitutes.

The Alternatives Assessment Guide is now complete and will be published by the Interstate Chemicals Clearinghouse (IC2) in early 2014. Ecology will apply the Guide to the problem of copper-based boat paints. Sale of such paints is banned in Washington, beginning in 2018 (RCW 70.300). This law also requires Ecology to "study how antifouling paints affect marine organisms and water quality." EPA has already evaluated a number of non-copper based alternatives for both cost and performance. Ecology will supplement this data with information on hazard and exposure, and identify safer alternatives to copper-based boat paint. This data set is sufficient to also allow the agency to compare the three frameworks defined in the Guide.

Ecology, in partnership with Boeing, Washington State University, and others developed a green chemistry roadmap to create solutions to address the problems posed by chemicals used in products today. Using NEP funds, a Request for Proposals was issued to fund the startup costs for creation of a self-sustaining Green Chemistry Center. Tech Law was hired in spring 2013 and work is underway to develop a sustainable center in Washington.

TSCA Reform

Washington continues to provide leadership to states interested in reform of federal toxics policy. Ecology worked with a contractor through funding provided by the Bullitt Foundation to create a consistent, coordinated state voice in federal policy reform efforts. Ecology continues to coordinate the

states' response to TSCA reform bills. We also continue to work with the Environmental Council of the States in support of TSCA reform and petitions to EPA to support better, more protective regulation of chemicals such as PCBs.

Partnering for the Environment through Washington's Electronic Product Recycling Law

In January 2007, Ecology began implementing *Chapter 70.95N RCW, Electronic Product Recycling*, by registering manufacturers of desktop computers, portable computers, computer monitors, and televisions into the Electronic Product Recycling Program (now known as the E-Cycle Washington Program).[1] As of January 1, 2007, to legally sell these products in or into the state of Washington, manufacturers were required to:

- ✓ Register annually with Ecology and pay a program administration fee.
- ✓ Label their products with their brand.
- ✓ Participate in a plan to provide services for collection, transportation, processing and recycling these electronic products at the end of their useful life.

Manufacturers are automatically members of the Washington Materials Management and Financing Authority (WMMFA). As of January 1, 2009, they were required to participate in the Standard Plan for recycling electronic products. As of 2010, if a manufacturer or a group of manufacturers meet certain requirements, they can opt out of the Standard Plan and form an independent recycling plan with Ecology's approval.

The Standard Plan (the default recycling plan) is managed by the WMMFA Board of Directors, comprised of 11 large and small computer and television manufacturers. The Board of Directors will prepare, submit, and implement the Standard Plan for recycling electronic products covered by the law.

Through the first five years of program operations (2009-13), all manufacturers participated in the Standard Plan administered by WMMFA. Independent manufacturer plans were proposed in 2009 and 2010, but Ecology could not approve them due to insufficient collection networks.

Since January 1, 2009, households, charities, school districts, small businesses, and small governments have been able to drop off electronic products covered by this law for recycling at no charge.

[1] *Chapter 173-900 WAC, Electronic Product Recycling Program* specifies requirements of this program for manufacturers, collectors, transporters and processors of electronic products covered by the law (see http://www.ecy.wa.gov/pubs/0707042.pdf).

E-Cycle Washington Program Accomplishments

Highlights

- In 2009, the first year of operation, the program exceeded all predictions by recycling *38.5 million pounds* of TVs, monitors, and computers. Now in its fourth year, E-Cycle Washington collections have continued to grow.

Table 2.1
E-Cycle Washington Collections 2009-13

	Pounds Collected (Millions)
2009	38.5
2010	39.5
2011	42.2
2012	43.5
2013	45.2

- In mid-2011, the E-Cycle Washington Program achieved the ***100 million pound*** milestone for electronics recycled. In 2011, Ecology also expanded the scope of products covered by the program to include tablet computers and electronic book readers, also known as e-readers.

- Washington is a national leader in recycling electronics with a 6.4 lbs/capita average in 2012.

- 330 collection sites and services have been established across the state. Drop-off sites and services are available in every county and city with a population of 10,000 or more.

- Eight processors (recyclers) of electronic products have undergone the required compliance audit to prove they will meet the performance standards and have registered to provide recycling services for the E-Cycle Washington Program.

- The E-Cycle Washington Program is not just about recycling. Charitable organizations acting as collection sites have reported that over the first four years of participation in the program, approximately 118,000 working units received through the E-Cycle Washington Program were sold for reuse.

E-Cycle Washington Website

The website developed for the Electronic Product Recycling Program continues to provide up-to-date, detailed information for all affected parties on registration requirements, fees, public involvement opportunities, and more (see http://www.ecyclewashington.org).

Public Information and Education Campaign

A public information and education campaign was launched in 2008. A program name, logo, and easily identifiable web address were developed through a stakeholder workgroup. A toolkit full of information was also developed and distributed to local governments to help them promote the E-Cycle Washington Program. A similar toolkit and public outreach materials were made available for electronics retailers. Public education materials prepared by Ecology and WMMFA continue to be distributed at events and fairs, and through mailings. In addition, promotions for E-Cycle Washington have appeared in various publications and online advertisements, as inserts in utility bills, on buses and ferries, and on Interstate 5 billboards.

Ecology continues to work with retailers of electronics, encouraging them to provide consumers with information about the E-Cycle Washington Program when new electronics are purchased. WMMFA sponsors radio and TV ads across the state to inform the public about the free program for electronics recycling.

Stakeholder Concerns

Ecology is not aware of any stakeholder concerns at this time, although interest continues to grow around the idea of further expansion of the scope of products covered to include computer peripherals and other electronics.

Partnering for the Environment through Mercury-Containing Lights Product Stewardship

The mercury-containing lights law (Chapter 70.275 RCW) requires a producer-financed product stewardship program for the collection, transportation, and recycling of mercury-containing lights. Mercury-containing lights are important to safely collect and recycle for the following reasons:

- Mercury is a toxic metal that accumulates in our bodies and the environment.
- When mercury-containing lights are broken, mercury is released into the environment.
- Use of mercury-containing lights is increasing, because they are energy efficient.
- A safe way to collect and recycle these lights is needed.

The program passed some milestones and hit a few speed bumps in 2012 and 2013:

- Ecology approved the Light-cycle Washington Mercury-Containing Lights Product Stewardship Standard Plan in November 2012 (go to http://www.ecy.wa.gov/programs/swfa/mercurylights/ to review the plan). The plan identified nearly 200 collection sites around the state with interest in participating in the program.

- The Mercury-Containing Lights Product Stewardship Rule became effective in December 2012 (Chapter 173-910 WAC). The National Electronic Manufacturers Association (NEMA), the mercury-containing light producers' industry association, filed a lawsuit over the financing requirements in the rule.

- The program start on January 1, 2013, was postponed due to the unresolved financing issues.

- In May 2013, the Thurston County Superior Court ruled in favor of NEMA, invalidating the financing requirements in rule. Ecology appealed this ruling and the program remains on hold.

Mercury-Containing Lights Product Stewardship Program

Ecology approved the *Standard Plan* for the Washington Mercury-Containing Lights Product Stewardship Program (see www.ecy.wa.gov/programs/swfa/mercurylights/).

The Standard Plan establishes a "comprehensive, safe, and convenient collection system" in Washington that may include existing residential curbside and mail-back collection systems. The program will accept end-of-life mercury-containing lights from single-family and multi-family household generators, and persons (including businesses) that deliver no more than 15 mercury-containing lights to registered collectors during a 90-day period. This program will reduce the improper disposal of spent mercury lighting, which releases mercury that threatens human health and the environment.

The Standard Plan estimates collection and recycling of nearly one million mercury-containing lights during the first year of operation. Results of program operation will be reported to Ecology each year by June 1. Those annual reports will be posted online at www.ecy.wa.gov/programs/swfa/mercurylights/ .

Program Operator

The Light-cycle Washington Program will be managed and operated by EcoLights Northwest LLC (EcoLights). EcoLights specializes in management and recycling of mercury-containing lights and tubes. EcoLights is the only licensed "final destination" lamp recycler in Washington and the largest in the Pacific Northwest. Mike O'Donnell is the program manager for EcoLights (mikeo@ecolights.com, www.walights.org).

Collection Service

The Light-cycle Washington Program will use a network of permanent, year-round locations for the collection of program products. There will be no charge imposed to drop off up to 15 lights in any 90-day period. Any organization interested in joining the program to provide collection service should contact Mike O'Donnell.

Collection sites will include retailers, recycling organizations, and businesses (both non-profit and for profit); local government Household Hazardous Waste (HHW) or Moderate Risk Waste (MRW) collectors; local government recycling centers; solid waste hauler curbside programs; transfer stations; and other associations or businesses interested in participating in the program, including any other locations which currently collect mercury containing lights. The list of collection sites will be provided on the Light-cycle Washington website (www.walights.org).

Program Startup

The Light-cycle Washington Program was not operational on January 1, 2013. As the situation changes related to this program, the status will be updated at www.ecy.wa.gov/programs/swfa/mercurylights/.

Where to recycle lights today

Washington State law (RCW 70.275.080) prohibits the disposal of mercury-containing lights by any Washington State resident, businesses, or entity, effective January 1, 2013. Mercury-containing lights must be recycled. Following is information to locate a collection site near you:

- Department of Ecology - 1-800-RECYCLE database, fluorescent lights are listed under the Household Hazardous Waste category.
- Puget Sound Energy (PSE) - PSE maintains a network of participating locations that collect Compact Fluorescent Lights (CFLs) at no charge.
- Take it Back Network - This group of retailers, repair shops, non-profit organizations, waste haulers, and recyclers offers options for recycling certain products that should not be disposed of in the trash. The network includes locations recycling CFLs, linear and HID lights in Snohomish, King and Pierce Counties.
- Earth911.com - Nationwide database for a variety of recyclable materials.
- Light-cycle Washington website www.walights.org
- Ecology website http://www.ecy.wa.gov/programs/swfa/mercurylights/
- Ecology publication https://fortress.wa.gov/ecy/publications/publications/1207064.pdf

Partnering for the Environment through Environmentally Preferable Purchasing (EPP)

Environmentally preferable products and services are those that have a less or reduced harmful effect on human health and the environment, when compared to competing products or services that serve the same purpose. Each year, state and local governments in Washington have the opportunity to leverage more than $4 billion in purchasing power to buy products and services that:

- ✓ Reduce greenhouse gases.
- ✓ Conserve energy and water.
- ✓ Reduce the amount of toxics in products and promote safer chemical alternatives.
- ✓ Decrease waste and unsustainable packaging materials.
- ✓ Maximize the use of recycled content materials.
- ✓ Support markets for green products and green jobs.
- ✓ Reduce maintenance and disposal costs, increase product life, and result in fewer health and safety claims.

The state's Solid and Hazardous Waste Plan (Beyond Waste) encourages state government to increase purchases of environmentally preferable goods and services. Ecology's environmentally preferable purchasing (EPP) team includes staff from the W2R and Hazardous Waste and Toxics Reduction (HWTR) programs, and Ecology's Purchasing Office. The team helps state agencies meet Beyond Waste EPP goals.

Ecology provides technical assistance to local governments and businesses that want to establish or expand their EPP programs. By promoting safer products and services, EPP supports Ecology's key initiatives on reducing toxic threats, saving Puget Sound, and facing climate change.

Laws and Directives

The 2012 Legislature passed Senate Bill 5931 to consolidate state procurement laws under the Department of Enterprise Services. The legislation is designed to make the procurement process more transparent, competitive, and efficient Senate Bill 5931 states that when agencies are determining the lowest responsive and responsible bidder, they may consider best value criteria, including whether the bid considers human health and environmental impacts. This bill gives stronger standing to agencies in soliciting bids that include green products.

State government is also directed through Executive Orders 02-03 and 5-01 to lead by example in environmentally preferable purchasing. Agencies are directed to:

- ✓ Increase purchases of environmentally preferable products to help expand markets.
- ✓ Reduce energy use.
- ✓ Reduce greenhouse gas emissions.
- ✓ Reduce water use.
- ✓ Institute green building practices.

Paper Conservation Program

In 2009, the Washington State Legislature passed into state law *Chapter 70.95.725, Paper conservation program* and *Chapter 43.19A.022, Recycled content paper for printers and copiers – Purchasing Priority*. The legislation requires state agencies to:

- ✓ Purchase 100 percent recycled content, white cut sheet bond paper for use in printers and copiers.
- ✓ Develop and implement a paper conservation program to reduce use of printing and copy paper by 30 percent of current use.
- ✓ Develop and implement a paper recycling program, with the goal of recycling 100 percent of all copy and printing paper in all buildings with 25 employees or more.

The legislation has been in effect since July 2010.

Outreach to State Agencies and Local Governments

State agencies and local governments buy goods and services through state contracts, agency contracts, and cooperative purchasing programs. Ecology provides training and technical assistance to purchasing, facilities, and sustainability staff at government agencies to help them identify and purchase EPP products. In 2013, the EPP Team responded to more than 40 technical assistance requests from state agencies, local governments, businesses, and other entities.

In 2013, Ecology participated in the Government Purchasing for Climate Protection Workgroup of the EPA West Coast Climate and Materials Management Forum. As discussed in EPA's Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices, the full lifecycle emissions associated with waste, materials, and products contributed 42 percent to the U.S. greenhouse gas inventory in 2006. These impacts are much larger than conventionally recognized by most greenhouse gas inventories. The workgroup's focus is to plan and develop tools for local governments to increase awareness of and use green procurement strategies to be more effective in reducing greenhouse gas emissions.

Ecology's Buy Green, Save Green website highlights how local and state governments are saving money by purchasing green products (see http://www.ecy.wa.gov/programs/swfa/epp/. The website offers the following updated information:

- ✓ How to save money while purchasing greener electronic products, cleaning products, landscape management products, and services; lighting; office products; paint; and vehicles and automotive products.

- ✓ The "Who is Buying Green?" section offers highlights of local, state, and federal agencies that are creating EPP policies, writing Annual EPP Reports, and offering guidance on how to buy green. If your agency wants to be included on this webpage, please contact Tina Simcich at tina.simcich@ecy.wa.gov.

- ✓ How to identify rigorous environmental performance levels using standards and certification programs.

- ✓ EPP related laws and directives in Washington State.

- ✓ Resource guides on starting an EPP program, life-cycle assessment, and green meetings.

If you are interested in keeping up to date with developments in green purchasing, join Ecology's Green Purchasing listserv at http://www.ecy.wa.gov/programs/swfa/epp/.

Promoting Green Janitorial Supplies State Contract

In 2013, a new all green janitorial supplies contract was developed by Oregon's Department of Administrative Services in partnership with Washington's Department of Enterprise Services (DES). Oregon and Washington agencies spend more than $20 million on janitorial supplies annually. The contract was developed with support from the Oregon Department of Environmental Quality, Washington Department of Ecology and Responsible Purchasing Network - supply public agencies with green janitorial supplies that reduce the use of toxic chemicals without increasing costs.

State contract #00812 offers a wide range of janitorial supplies, including cleaning chemicals for a wide variety of applications; janitorial paper supplies; deicers; floor care products; powered janitorial equipment; waste can liners; and sanitizers and disinfectants. Ecology assisted DES in promoting the contract to state governments, as well as local governments and public schools which may also take advantage of the bulk pricing available from the contract.

Promoting Strong Product Standards and Certification Programs

Standards and certification programs are important tools to encourage design of products and services with positive environmental attributes. Standards establish specific human health, environmental, and social criteria by which products can be measured and compared.

Certifications or "eco-labels" are awarded to products that meet the environmental standard. This makes it much easier for purchasers to "green" their contracts, as the standard can be incorporated in bid documents in just a few sentences.

Ecology promotes reliable standards and certification organizations that:

- Address product lifecycle stages from raw materials extraction, to manufacturing, to end-of-life.
- Are independent of ties to product manufacturers.
- Require onsite testing and verification by an independent laboratory or certifying organization.
- Use a broad-based stakeholder consensus process (typically involving manufacturers, users, government, non-profit organizations, and academia) or other rigorous process to develop standards.
- Provide transparency on their organizational structure, funding, and standards development process.
- Periodically review standards to stay current with new technology and emerging information about human health, environmental, and social impacts.

By leveraging a significant portion of the state's buying power, independent third-party standards encourage design of products and services with positive environmental and human health attributes.

EPP at Ecology

Ecology has been a leader in implementing EPP in its own operations for much of its 40-year history. In 2009, Ecology updated Policy 13-04 on EPP to align with agency priorities on climate change, reducing toxic threats, and resource conservation. The EPP policy applies to development of agency grants and contracts. Ecology's actions will also help address the Governor's mandate that Ecology lead the way in moving state government to carbon neutrality.

In 2013, EPP project examples were included in the 2013 Coordinated Prevention Grant (CPG) Offset cycle guidelines. Ecology also developed sample EPP language that agency planners can recommend to local governments to include in their hazardous waste and solid waste plans.

Partnering for the Environment through Recycling and Beneficial Use of Organic Materials

With an overarching goal to turn organic wastes into resources, the State Plan's Organics Initiative promotes a close-loop organics management system where markets for organic-based products are robust, and businesses thrive by creating new products from wasted organic materials. Through partnerships with other agencies and organizations, the vision for a close-loop organics management system is becoming clearer.

Waste to Fuels Technology

In 2006, the Washington State Legislature directed Ecology to form a partnership with Washington State University (WSU) titled "*Waste to Fuels Technology.*"

> *"The Department will form a partnership with Washington State University to conduct research on markets, products, and bioenergy potential. Specific activities will include beginning a pilot project to convert solid waste to biogas through anaerobic digestion and to complete a biomass inventory. The project will include economic and technical assessments to help the public sector and private business complete bioenergy projects*."

Waste to Fuels Technology projects have focused on balanced approaches for recovering fuels from organic solid wastes. Ecology continues to support developing science and engineering for a municipal organics food and green waste HSAD. We also now provide support in the form of an extension and outreach effort to commercial the anaerobic digester industry. We are also continuing to work on another project this biennium to produce transportation fuels, green gasoline and bioethanol, while producing extremely stable carbon "biochar" for improving soil productivity through pyrolysis.

Nutrient Recovery

Food scraps and green waste are generating significant odor emissions at composting facilities. Anaerobic digestion is one possible solution, with a proven track record at digesting food scraps and a combination of wastes while reducing the odor emissions. Although nitrogen and phosphorus are not converted during the digestion process, these nutrients can be recovered from the effluent. This would reduce the threat of soil and water contamination and create another revenue source.

Aeration of the digestate from anaerobic digestion of green waste, food scraps, and combined green waste and food scrap resulted in significant stripping of nitrogen and phosphorus for every sample tested. The highest removal efficiencies occurred on the combination green waste/food scrap effluent. Results indicated that scale-up of this technology on non-manure waste streams is warranted.

If scale-up is successful, nutrient recovery has the potential to resolve concerns related to NH_3 inhibition (a known concern during anaerobic digestion of green waste and food scraps) as well as reduce water usage. The water usage benefit arises from the fact that once the inhibitory NH_3 is removed, anaerobic digestion effluent could then be used as dilution water needed at the front end of the anaerobic digestion process.

Co-Digestion of Acids from Pyrolysis Condensate

Thermochemical pyrolysis and torrefaction produce a range of compounds in gases and condensable liquids. Condensate liquid is acidic and relatively rich in oxygen, therefore requiring further processing. Simple carbon C1-C4 compounds including formic, proprionic and acetic acids, and hydroxyacetaldehyde and monophenols that are water soluble were separated from condensate and tested in anaerobic digestion. The main conclusions were that:

- The acids components can be a source for CH_4 production via anaerobic digestion when co-digested.

- Hydroxyacetaldehyde and monophenols were found to inhibit anaerobic digestion, limiting higher concentrations of pyrolytic and torrefaction aqueous phase from being successfully digested.

A second experiment demonstrated that co-digestion of acids in a plug flow digester can be a means to increase methane production. Addition of acids through multiple ports along a floor scale digester was found to digest the acids. However, the digester can become overwhelmed with acid beyond a narrow range. Acid addition depends on the alkalinity from the dairy manure system to buffer the acid impacts.

Micro Algae Production of Liquid Fuel Intermediates

WSU scientists evaluated microalgae as a means for methane production at anaerobic digestion facilities. The carbon to nitrogen ratio in the microalgae was low, thus not a good source for additions to anaerobic digestion for increasing methane outcomes.

Models

Two mathematical modeling efforts were conducted in the last biennium: one to create a biochemical model of anaerobic digestion with mixing, and the other a thermochemical model of biomass breakdown reactions occurring during pyrolysis heating. These models use basic feedstock characteristics and process methods to predict anaerobic digestion or pyrolysis outcomes. The process system models were developed to allow for quicker assessment of the fuel production, heat capacity, nutrient, and by-products from a feedstock source, and to assess relative bio- and/or thermo-chemical process and economic outcomes. The models were calibrated with laboratory data and do a good job of predicting chemical process outcomes.

Engineered Biochars for Nitrogen and Phosphorous Recovery

Well stabilized biochar has a high surface area as measured in square meters of surface/gram of char. Biochars may have surface area in the range of activated carbon 500 m^2/g - >2000 m^2/g. These chars have reactive exchange sites on surfaces where cations are adsorbed. Biochar is naturally oxidized over time in soils, creating higher cation exchange capacity (CEC). This task evaluated biochars from anaerobic digestion fiber, hardwood poplar, and softwood pine for increased exchange capacity after exposing the char surfaces to several oxidizing treatments. Greater ammonium ion sorption was found on the biochar with increased CEC. The various biochars were also pre-treated with calcium and iron solution. Phosphorous sorption was markedly higher in biochar pre-treated with calcium.

WSU Contract Amendment for Odor Literature Review

In April 2013, the Interagency Agreement for the Waste to Fuels Technology was amended to include a global literature review of compost odor impacts. Compost processors from many facilities around the world have odor challenges, largely due to higher loading of food and green feedstocks. Food and green feedstocks begin decomposition quickly, and turn acidic even prior to tipping at compost yards. Several processing methods including greater aeration (oxygen) addition, smaller pile sizes, greater turning, and increased air treatment system capacity were identified as possible solutions. Biological pre-treatment could include food waste separation and anaerobic digestion, which can treat the acidic decomposition products. Addition of biochar and high carbon ash have been found to reduce odors in compost processes.

Partnering with State Governments to Build Strong Markets for Recycled Organic Materials

Increasing Access to Compost Markets

Composting effectively turns wasted organic materials into a valuable product. However, if markets are weak, the finished product may become a burden rather than a boon to compost facilities. We continue to work with state government to suggest changes to compost specifications and purchases made by government agencies. Several fact sheets are available on Ecology's Compost and Healthy Soil web page under the "Tools" section. The fact sheets (including one on Buying and Using Compost) increase awareness of the benefits of using compost.

Building Support for Healthy Soils

Maintaining and building healthy soils creates opportunities for sequestering carbon, protecting Washington waters, and increasing food security. Several fact sheets are available on Ecology's Compost and Healthy Soil web page under the "Tools" section. The fact sheets (including one on Building Healthy Soil) increase awareness of the benefits of healthy soil**.**

Partnering with the Washington Organic Recycling Council (WORC) to Promote Beyond Waste Goals

Improving Compliance and Product Quality at Compost Facilities

WORC is a nonprofit association dedicated to support and promote all aspects of organic recycling. WORC members include compost facility owners and operators, local and state government representatives, and others with an interest in organic material management.

Since 1995, WORC has hosted Compost Facility Operator Training (CFOT). The training provides an invaluable opportunity for students and instructors to learn and share ideas on proper operation and regulation of compost facilities in Washington. The students from around the region (and beyond)

gather for a week of lecture and hands-on training at the WSU Puyallup Research Station. More than 540 students have completed CFOT. Core instructors consist of Ecology and WSU staff, compost engineers/consultants, and compost facility operators.

The 2013 training was held October 14-18 with 40 students, 6 core instructors, and 19 guest presenters/panelists. Since it is the only training of its kind in the state and surrounding area, it attracted students from Washington, Oregon, and Hawaii. The training included lectures, panels, fieldwork, and field trips. Presentations covered odor control, facility design, soil biology, and more. In addition to classroom lessons, students received hands-on experience building their own compost piles and evaluating pre-built piles. They learned safe, effective ways to make compost from a multitude of feedstocks.

Students learned current compost science: How to blend incoming feedstocks to create the correct moisture levels; carbon to nitrogen ratios and porosity; and how to manage compost piles to maintain aerobic conditions and produce a high-quality finished product. They also learned how to sample, market, and use compost. We toured Silver Springs Organics, LRI's Compost Factory, and one biosolids composting facility (JBLM). In addition to our Compost Operator and Compost End User panels, the Regulator Panel consisted of ORCAA, Ecology (Water Quality), and King and Snohomish County Health representatives. Washington State Department of Agriculture (WSDA) was represented on the End User Panel to discuss materials approved for use on organic farms.

As a result of the training, operators and regulators learned about compost operation challenges, and increasing compliance and product quality at compost facilities. Participants took a final exam and received a certificate of achievement.

2013 WORC Compost Facility Operator Training (Tour of the JBLM Compost Facility)

Commercial Sector Role in Reaching a Closed-Loop Organics Recycling System

Commercial composting is one of the key elements in the closed-loop organics recycling system. Compost facilities that process organics like yard debris and food scraps must use well-trained staff to produce a consistent, high-quality product. At the same time, commercial composters must operate their facilities to ensure they protect human health and the environment.

Washington State's law on solid waste handling, recovery, and recycling is Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling. It was created to prevent land, air, and water pollution, and conserve the natural, economic, and energy resources of the state. Chapter 173-350 WAC, *Solid Waste Handling Standards*, was written to implement the law, and contains specific requirements for organics and other solid waste management.

In 2013, Washington State's composting regulation (WAC 173-350-220) was revised. For more information, see http://www.ecy.wa.gov/programs/swfa/organics/law.html.

In 2012, Washington had 44 compost facilities operating with a solid waste handling permit or conditional exemption for permitting (down from 49 in 2011). However, when biosolids regulated composting facilities are included, the total increased to 66 (up from 65).

Washington State compost facilities composted 1,211,805 tons of material in 2012 (up from 1,106,228 tons in 2011). Table 2.2 highlights the variety of materials composted. Overall, Washington had more compost facilities and composted more feedstocks compared to 2011. The increase in feedstocks could in part be attributed to the 81,000 ton increase in yard debris composted. Speculations of why more yard debris was composted could include less material burned and/or landfilled; more storm debris, plant growth, and removal of plants; and a healthier economy.

Yard debris continues to be the primary compost feedstock category (>509,000 tons). Yard debris was also the compost feedstock category with the largest increase (>81,000 tons). The largest decrease was post-consumer food (>64,000 tons). This increase/decrease may be a result of post-consumer food being placed in yard waste only containers. Also, two fewer facilities accepted post-consumer food. Pre-consumer food and food processing materials increased (>27,000 tons). However, when combined with post-consumer food, "food waste – all other" decreased (>37,000 tons).

Although loads of post-consumer food decreased, mixed loads of yard and food increased (>29,000 tons). Increases were also seen in agricultural, biosolids, crop residue, industrial organics, and land clearing materials composted. Decreases were also seen in manure, mortalities, sawdust, and other wood materials.

Food was composted at 21 facilities throughout the state (up from 19 in 2011). Of these facilities, 13 accepted pre-consumer food (up from 11), 7 accepted food processing waste (down from 8), 7 accepted post-consumer food (down from 9), and 8 accepted mixed residential yard/food scraps (unchanged).

Washington State composting facilities produced 949,632 cubic yards of finished compost. This was 224,800 cubic yards less then what was produced in 2011. With the increase in feedstocks and decrease in finished compost reported, facilities might be taking longer to compost their materials.

Table 2.2
Organics Recovery Comparison (tons)

	2011	2012
Composted		
Crop residue	68,971	92,714
Yard debris with food (mixed residential)	141,208	171,005
Food waste, all other (pre/post/processing)	170,146	132,606
Land clearing debris	71,124	100,680
Yard waste	427,232	509,062
Wood waste, all other	55,880	51,700
Other materials composted *(other agricultural waste, biosolids, cardboard, industrial organics, manure, mortalities/animal parts)*	171,665	154,037
Total materials composted	**1,106,228**	**1,211,805**
Diverted		
Land Clearing Debris	88,962	71,282
Wood for Energy Recovery	751,364	563,733
Yard Waste for Energy Recovery	118,909	129,847
Other diverted materials	551,697	596,047
Total Diverted Materials	**1,510,932**	**1,360,909**
Total Recovery (Compost + Diverted)	**2,617,160**	**2,572,714**

Ecology continues to work with WSU Cooperative Extension researchers, consultants, and local governments to educate potential composters about new opportunities and their responsibility to use best practices when composting even small volumes of material. We also continue to partner with the Washington State Department of Transportation to promote compost use for erosion control and storm water management along roadways.

Partnering for the Environment through Anaerobic Digestion

State law provides an exemption from solid waste handling permitting for co-digesting dairy manure and organic waste under specific conditions (Chapter 70.95.330 RCW). This exemption is incorporated in the Solid Waste Handling Standards (Chapter 173-350-250 WAC). These digesters must obtain and comply with other applicable state and local permits. A digester that does not meet these conditions is required to obtain and comply with a solid waste handling permit from the jurisdictional health department.

Basics of Manure Management

A full-grown dairy cow generates 100 pounds of manure per day. That means the 200,000 full-grown dairy cows in Washington produce up to 20 million pounds of manure each day.

Historically, dairy cows wandered around family farm fields spreading manure (or *nutrients* as some farmers like to say), effectively fertilizing the land as they grazed. Today, dairies often confine cows in feedlots where manure is flushed into a lagoon for storage until it is used to fertilize crops. Open lagoon storage of manure creates odor issues from methane, hydrogen sulfide, and ammonia releases.

Anaerobic digesters help address manure odors, capture greenhouse gases, and recycle nutrients. Digesters also provide revenue streams for dairies in these difficult economic times. Digester use in Europe is well developed, with more than 600 manure digesters in use. The U.S. Environmental Protection Agency (EPA) estimates 200 of the 65,000 dairy farms in the U.S. use manure digesters (for more information, see the EPA's AgSTAR website at www.epa.gov/agstar/projects/index.html). The Climate Action Team Study estimated that 135 of the 500 dairies in Washington could manage manure in an anaerobic digester (dairies with more than 500 cows).

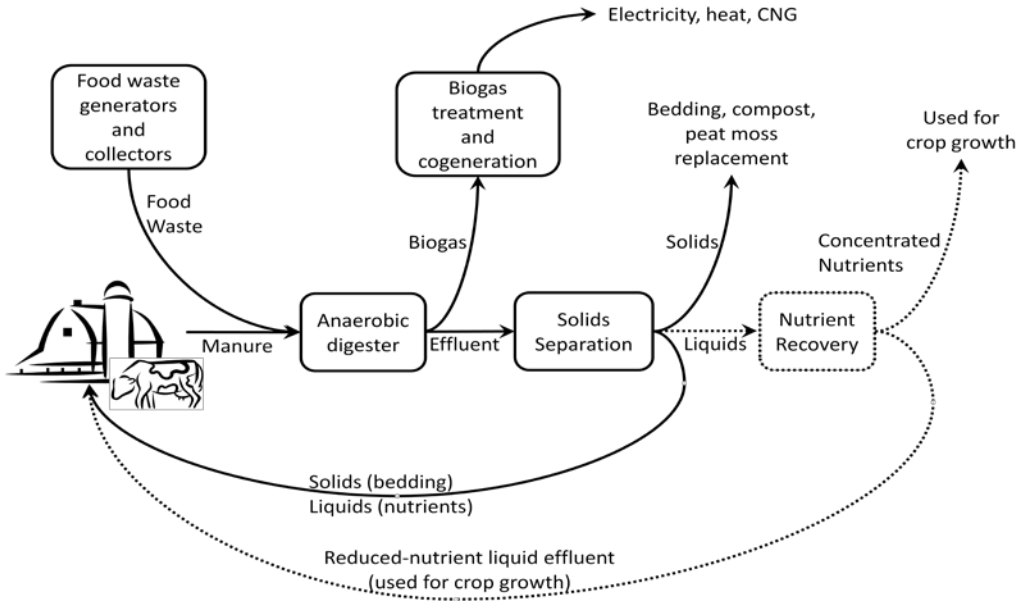
Manure digesters in Washington are either concrete structures or metal tanks built to hold 21 days of manure at roughly 100°F. Dairy manure is piped or trucked to the digester, where it is often mixed with other organic materials like dairy, chicken, seafood, fruit, or food processing wastes. This manure mix is continuously fed into the digester. One of these operating digesters takes in more than 60,000 gallons of manure each day.

In the digester, anaerobic bacteria convert the manure and organics into biogas, solids, and liquids. The biogas consists mostly of methane (a greenhouse gas 20 times more potent than carbon dioxide) and carbon dioxide. Biogas pressure builds up in the concrete digester and a pipe delivers the biogas to a modified natural gas engine. Methane fuels the engine, which in turn spins an electric generator to create electricity.

Under normal dairy operations, methane is released into the atmosphere during lagoon storage of manure. Processing manure in an anaerobic digester captures this methane and reduces greenhouse gas emissions from dairy operations.

Waste heat from the engine can be used to keep the digester warm and can offset fuel purchases on the farm. Excess electricity can be sold back to the local utility. After 21 days, the output from the digester is mechanically separated into solid and liquid digestate. Solid digestate can be used to replace sawdust or sand, which the dairy would normally purchase for cow bedding. Liquid digestate is returned to the dairy manure lagoons for storage and later used as fertilizer. The nutrients in the liquid digestate can be used in place of synthetic fertilizer.

Figure 2.2
Dairy Anaerobic Digester Schematic
(Graphic Courtesy of WSDA)



Dairy Digesters in Washington

Today, a double handful of dairy farms in Washington use anaerobic digesters to put their cow manure to work generating renewable energy. Table 2.3 summarizes the energy produced by co-digesting manure and organics in the dairy digesters operating under the solid waste permit exemption. The 29,324 megawatt-hours (MW-h) produced in 2012 is enough electricity to power 2,250 average homes in Washington.

The Washington State Department of Agriculture (WSDA) continues to oversee dairy manure management as required under the Dairy Nutrient Management Act (Chapter 90.64 RCW). The W2R Program and WSDA Dairy Nutrient Management Program collaborate on inspections, record reviews, and annual reports. At the end of each calendar year, digester operators report some information to W2R. Table 2.3 lists the energy produced and gallons of manure and organics digested by the permit exempted digester operations. Table 2.4 lists the active dairy digesters in Washington. Map 2.A shows where these dairy digesters are located around the state.

Table 2.3
Dairy Digesters Total Manure and Organics Processed

Calendar Year	Number of Digesters	Energy Produced (MW-h)	Manure Digested (million gallons)	Co-digested Organics (million gallons)
2009	3	7,536	44.2	9.5
2010	4	18,451	99.9	16.9
2011	6	25,311	150.6	19.7
2012	8	29,324	164.0	23.8

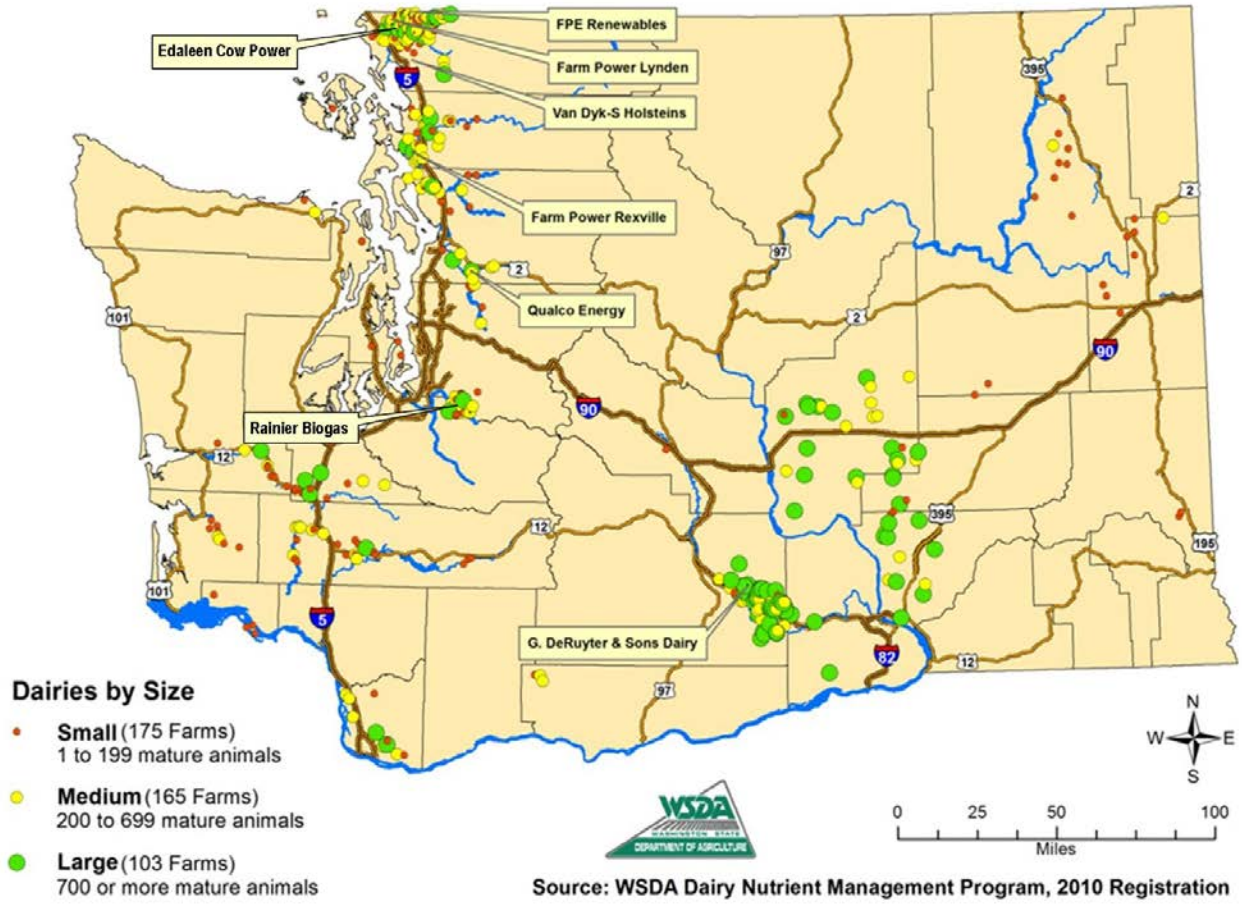
MW-h = megawatt-hours

Table 2.4
Washington Dairy Digesters

Digester	City County	Startup Year	Participating Dairies	No. Cows	Generator (kW)	Utility
FPE Renewable	Lynden Whatcom	2004	Vander Haak, Dee Bee Jersey farms	1,100	600	PSE
DeRuyter	Outlook Yakima	2006	DeRuyter & Sons	5,300	1,200	PacifiCorp
Qualco Energy	Monroe Snohomish	2008	Werkhoven	1,100	450	PSE
Farm Power Rexville	Rexville Skagit	2009	Beaver Marsh & Harmony	1,200	750	PSE
Farm Power Lynden	Lynden Whatcom	2010	MJD Farms	2,000	750	PSE
Van Dyk-S Holsteins	Lynden Whatcom	2011	Van Dyk-S Holsteins	1,000	400	PSE
Edaleen Cow Power	Lynden Whatcom	2012	Edaleen Dairy	1,700	750	PSE
Rainier Biogas	Enumclaw King	2012	Wallin; DeGroot Brothers; Ritter Dairies	1,200	1,000	PSE

PSE - Puget Sound Energy
kW – kilowatt

Map 2.A
Washington State Dairy Digesters



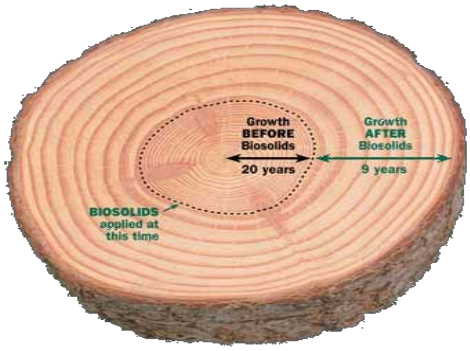
Partnering for the Environment through Biosolids Recycling and Beneficial Use

Biosolids are a beneficial resource, containing plant nutrients and organic matter that result from treating domestic wastewater. They are highly processed and thoroughly analyzed to ensure their safety. Ecology's biosolids program supports the state's goal and statutory preference for beneficial use of biosolids. In accordance with Chapter 70.95J RCW, *Municipal Sewage Sludge – Biosolids,* municipal sewage sludge that meets the quality standards for beneficial use is considered "biosolids" and regulated as a commodity, not solid waste. Ecology strongly encourages all producers of biosolids to pursue beneficial use.

In 2012 approximately 110,000 dry tons of biosolids were managed. Of this amount, approximately 81 percent was land applied and 18.5 percent incinerated. Less than 0.5 percent was landfilled. The following photos represent just some of the many uses of biosolids.

Biosolids are a great soil conditioner. They contain slow-releasing nutrients that are more eco-friendly than chemical fertilizers because they add organic matter to enrich depleted soils and fibrous matter to improve the soil's ability to hold water. Biosolids are highly valued by many, especially farmers, because they contain all of the essential plant nutrients, as well as vital organic matter that help plants grow.

Biosolids provide these nutrients in organic and inorganic forms. The inorganic forms of the nutrients, like commercial fertilizers, are immediately available to plants, while organic forms release slowly over several growing seasons, ensuring long-term enhancement of plant growth. These qualities also make them useful for land reclamation (e.g. strip mines, quarries, and gravel pits), landfill covers, composting, and forest land.



Use of biosolids in commercial forestry in Pierce County
(Douglas-fir growth before and after biosolids)

Use of biosolids in slope stabilization along
U.S. Highway 97A in Chelan County
(background, no biosolids; foreground, biosolids compost)

Use of biosolids in agriculture in Douglas County
(left, control; middle, commercial fertilizer; right, biosolids)

Use of biosolids in horticulture in King County
(left, control; right, biosolids compost)

Permit Program & Fees

Biosolids management is regulated through Chapter 173-308 WAC, *Biosolids Management* (the state biosolids rule), and the *General Permit for Biosolids Management* (Biosolids General Permit). Ecology staff, with assistance from local health jurisdictions (LHJs), oversees the state biosolids program.

The current state biosolids rule went into effect on June 24, 2007. The current Biosolids General Permit was effective August 20, 2010, and will remain in effect until August 20, 2015.

The state biosolids rule and the Biosolids General Permit govern the quality of biosolids applied to the land and practices at land application sites.

Biosolids must meet standards for pollutant limits, pathogen reduction, and vector attraction reduction appropriate to the intended end use. Biosolids used where future exposures are uncontrolled (e.g. lawns, home gardens, golf courses, top soils, etc.) must meet higher standards than biosolids applied to areas where access and crop harvest restrictions can be put in place. Biosolids must also meet standards for allowable recognizable manufactured inerts similar to that for composts under the state solid waste rule.

There are about 380 facilities required to be covered under the Biosolids General Permit. The majority of facilities are publicly owned wastewater treatment plants, including those at state and federal facilities. Other types of facilities required to seek coverage under the Biosolids General Permit are:

- Privately owned treatment facilities that treat only domestic wastes.
- Certain composting facilities that use biosolids as a feedstock.
- Biosolids beneficial use facilities (land appliers who obtain a permit to reduce the permitting requirements for their clients).
- Septage management facilities (persons who treat or land apply septic tank materials).

Coverage under the General Permit is provided in two phases:

1. Provisional approval.

2. Final approval.

A facility obtains "Provisional" approval by submitting a *Notice of Intent* and a complete *Application for Coverage* as provided in the state biosolids rule and the Biosolids General Permit. Under provisional approval, a facility is authorized to carry out biosolids management activities according to the conditions of the Biosolids General Permit; conditions in any submitted plans; conditions in the state biosolids rule; and conditions in any other applicable state, local, or federal regulations.

"Final" approval may be granted after a full Ecology review of the permit application and operating practices. In issuing final approval, Ecology often imposes "additional or more stringent" conditions necessary to ensure proper biosolids management, and protection of human health and the environment. Any such conditions are subject to appeal.

Ecology charges a fee to permittees to support the state biosolids program. Currently, the permit fee brings in about $941,000 and supports about 7 FTEs committed to implementing the biosolids program at Ecology.

Delegation to Local Health Jurisdictions

Currently five LHJs have accepted some degree of delegation to carry out the state biosolids program. Each delegated LHJ has entered into a formal Memorandum of Agreement with Ecology. The delegated LHJs have actively taken the lead to conduct various aspects of the biosolids program within their jurisdictions. Most other LHJs provide some degree of assistance to Ecology. Funding and workload demands on staff continue to be the major reasons LHJs do not pursue delegation of the biosolids program.

Partnering for the Environment through Beyond Waste Performance Indicators (aka Measuring Progress Initiative)

The State Solid and Hazardous Waste Plan's (Beyond Waste) 30-year plan has a clear, simple vision: Eliminate wastes whenever we can and use the remaining wastes as resources. The goal of the Measuring Progress initiative is to help Ecology and its partners develop and use a long-term performance measurement system that shows progress toward the overall vision as well as individual initiatives.

How Are We Doing on Achieving the Vision?

Ecology's W2R and HWTR programs work together to update and improve a series of indicators that track progress toward Beyond Waste goals. We are continuously improving our measures of Washington's success at reducing use of toxic substances, and the generation of solid and hazardous wastes. Ecology is also addressing the broader themes of the Plan by developing and maintaining indicators that show how our progress toward these goals relates to economic, environmental, and social vitality.

The Beyond Waste Progress Report (http://www.ecy.wa.gov/beyondwaste/bwprog_front.html) was first published in 2007 with eight indicators. 2013 marks the sixth update of the report, which now contains 22 indicators (7 main indicators and 15 alternate views), case studies for each initiative, targets for solid and hazardous waste, a greenhouse gas savings counter, and more.

The indicators track progress toward the Beyond Waste Plan initiatives - industries, green building, organics recycling, and small-volume hazardous wastes, as well as progress toward overall goals of reducing waste and toxics.

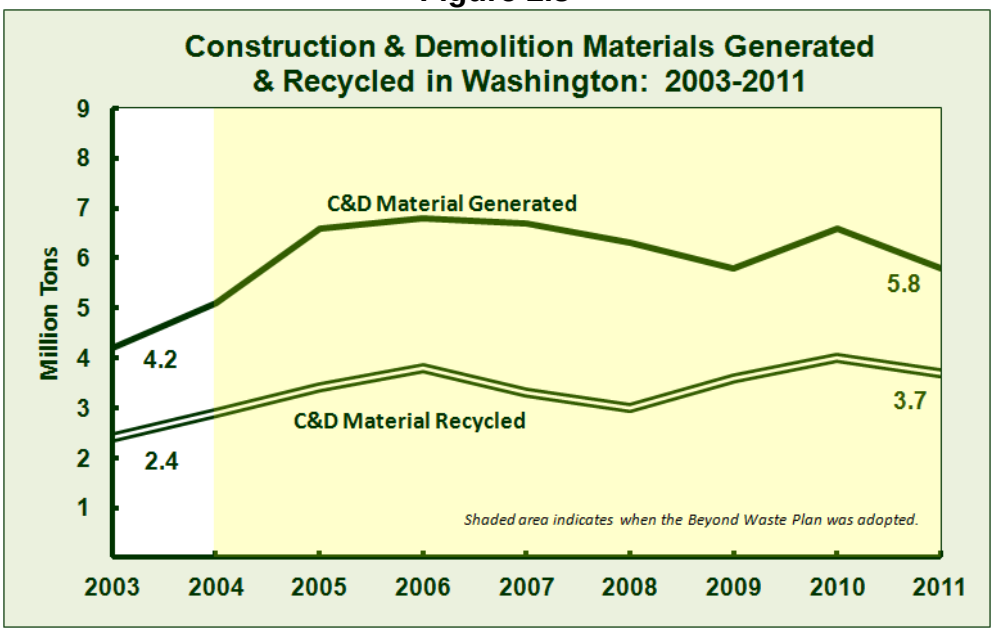
Ecology continues to implement recommendations from staff and stakeholders based on an evaluation of the Progress Report completed in 2010. Because of the input from this process, the report was restructured with primary and related indicators for each Beyond Waste initiative. Also due to the evaluation recommendations, the individual indicators are now updated when data is available, rather than waiting for a yearly update of the entire report. 2013 marks the second year of this page-by-page type of update.

Some recommendations from the 2010 evaluation continued to be implemented in 2013 or are currently under development, including:

- More charts and comparisons providing context, such as per capita data and case studies.
- Indicator climate change connections highlighted.
- Consumer Environmental Index (CEI) enhanced.
- Clickability on the website enhanced.

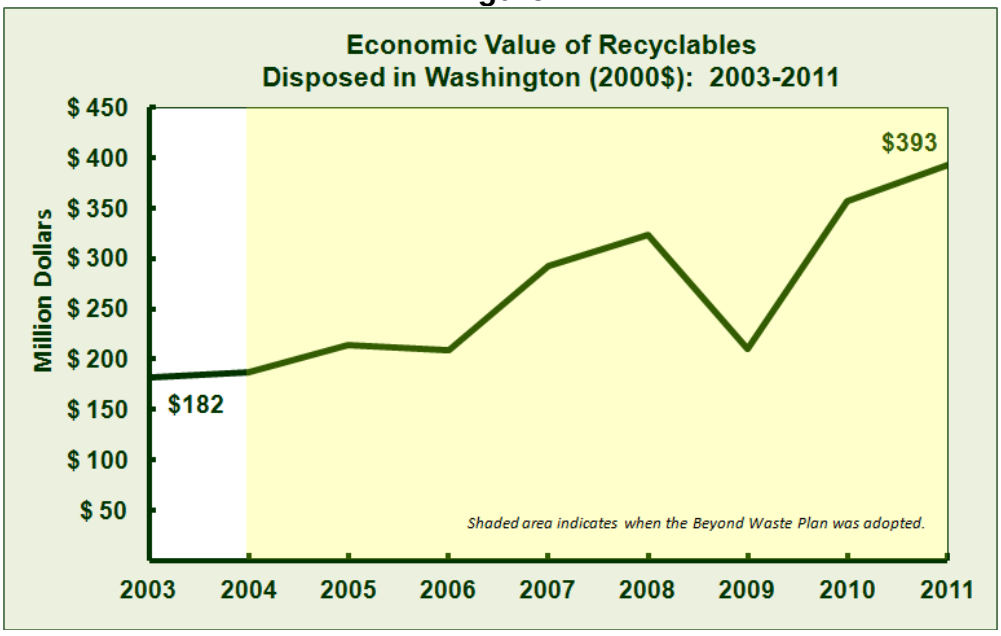
We continue to monitor trends related to implementation of the Beyond Waste Plan in the indicators. Baselines to gauge progress were established and we are making significant progress in some key areas. We recycled more solid waste, electronics, and organics over the last few years. Construction and demolition debris recycling increased slightly, while we disposed of less in recent years (Figure 2.3).

Figure 2.3



Some trends are disappointing. Despite our recycling efforts, in 2011 we disposed of $393 million dollars worth of recyclables in landfills (Figure 2.4).

Figure 2.4



Good news includes we are continuing to be successful in lowering mercury concentrations in biosolids, the index for toxic release risks from manufacturers is declining, and many businesses are creating less hazardous waste per dollar earned.

To see the full Beyond Waste Progress Report, including detailed information about each indicator, see http://www.ecy.wa.gov/beyondwaste/bwprog_front.html.

Partnering for the Environment through Waste Tire Prevention

Waste tires removed from Kitsap County in 2012

An environment free of waste tires is important to the public health of all Washington citizens. Piles of waste tires harbor mosquitoes, snakes, and other vermin. West Nile Virus, transmitted by mosquitoes, threatens health. Tire piles also present a dangerous fire hazard. Many tire piles exist for a significant length of time. Ecology has been working with public entities to clean up unauthorized dumpsites and prevent further waste accumulation.

Waste Tire Removal Account (WTRA) funding, created in 2006, is used to prevent and remove illegal tire piles. Funds in this account come from a $1 fee added to new replacement tires sold in Washington. Since 2010, Ecology receives a biennial budget of $1 million from the WTRA. These funds are used for agency costs and waste tire projects around the state.

Table 2.5 details the use of Waste Tire Removal Account funds from 2007 through summer 2013. Efforts funded from 2007-10 focused on removal of more than 175 unauthorized waste tire piles around the state. In 2010, the Waste Tire Removal account funding for Ecology was reduced to $1 million per biennium. Since 2011, the funds concentrate on removal of tire piles and amnesty efforts. Tire amnesty events generally consist of scheduled dates in a community when residents can drop off tires at no charge.

Table 2.5
Waste Tire Cleanups

Year	Tons of Tires	Dollars
2007	32,671	$ 4,300,079
2008	8,324	$ 1,933,954
2009	11,217	$ 2,648,464
2010	2,230	$ 597,365
2011	1,487	$ 250,252
2012	2,779	$ 467,898
2013	1,727	$ 290,760
TOTAL	**60,435**	**$ 10,4788,772**

Partnering for the Environment through Financial Assistance

Grants to Local Governments - Coordinated Prevention Grants

Coordinated Prevention Grants (CPG) have been historically funded by the Local Toxics Control Account (LTCA).2 Local governments use their CPG funds to implement their solid and hazardous waste programs. Current budget concerns in the state are putting pressure on all fund sources. One of our key initiatives over the next year will be to preserve dedicated accounts for solid waste management in Washington State.

Ecology administers the CPG Program through WAC 173-312, following the intent of the Model Toxics Control Act (Chapter 70.105D RCW) to:

- Fund local government projects that reduce contamination of the environment.
- Provide funding assistance to local governments for local solid and hazardous waste planning and for carrying out grant-eligible projects in those plans.
- Encourage local responsibility for solid and hazardous waste management.
- Promote regional solutions and cooperation between governments.

LTCA revenue is from the Hazardous Substance Tax (HST), a tax on the first possession of hazardous substances in the state. Projected revenues to LTCA available each biennium for CPG are divided into two portions: 80 percent for Solid and Hazardous Waste Planning and Implementation grants, and 20 percent for Solid Waste Enforcement grants. Solid Waste Enforcement Grants fund inspections and administrative expenses necessary to enforce state and local solid waste regulations pursuant to Chapter 70.95 RCW.

Eligibility

Eligible applicants for CPG grants include:

- Local planning authorities.
- Agencies designated as lead implementation agencies for Local Comprehensive Solid Waste Management Plans.
- Jurisdictional health departments (JHDs).

[2] Authorized by RCW 82.21.030 (Chapter 82.21 RCW, *Hazardous substance tax -- Model toxics control act).*

Ecology allocates available funds on a county-by-county basis, using a base amount for each county plus a per capita amount. Cities that are independent planning authorities and coordinate with counties are eligible to ask for and may receive funding up to the per capita allocation for their city. The availability and amount of funding depends upon legislative appropriations to the LTCA.

Grant Cycles

The CPG Program awards funds in two grant cycles: regular and offset.

Regular Cycle

Ecology allocates regular cycle funds based on the 80 percent allocation for Solid and Hazardous Waste Planning and Implementation grants, and 20 percent for Solid Waste Enforcement grants. CPG funds are distributed to recipients requesting their full or partial allocation in the regular cycle.

Offset Cycle

Funds for the offset cycle come from funds that no one requests in the regular cycle (unrequested funds), and from funds granted, but unspent during the regular cycle (unspent funds). Funds can also come from any special legislative appropriation. Ecology awards offset cycle funds through a competitive process.

2011-13 Biennial Grant Cycle

Regular Cycle

CPG ran an 18-month cycle (January 2012 – July 2013). CPG received an allocation of $28.6 million. Ecology had previously consulted with grant recipients and determined to bring the grant cycle into alignment with the biennium, and end the funding of agreements across the biennial line.

In a discussion with grant recipients regarding change to a biennial calendar, the majority of grant recipients expressed a willingness to adjust their local budget and planning processes as needed. Based on recipient input, Ecology chose to move CPG to a two-year grant cycle that aligns with the state biennial budget starting with the 2013-15 Biennium.

2011-13 Regular Cycle Highlight

The City of Auburn provided recycling opportunities for the public and employees at all city sponsored events and city parks. Grant funds from the regular cycle were used to continue adding recycling containers and supplies for use at events, parks, and in the downtown area.

During the 2011-13 grant cycle, household battery (alkaline only) collection was offered at nine sites in the City of Redmond. The sites included City Hall; the Senior Center; the Maintenance and Operation Centers; both Parks and Public Works; the Teen Center; the Old Redmond Schoolhouse; the Redmond Library; Fire Station 11; and the public safety building.

Offset Cycle

Ecology awarded funding for 30 grants totaling $2,728,072 in the Offset Cycle which ran from July 1, 2012, and ended June 30, 2013 to Washington counties, cities, and health authorities.

2013-15 Twenty-Four Month Grant

Regular Cycle

For the 2013-15 regular cycle, CPG drafted agreements based on a 24-month period (July 2013 –July 2015). Ecology aligned the agreements with the biennial calendar (July to June).

The Legislature allocated $28.2 million to the CPG Program for the 2013-15 Biennium. Ecology provided regular cycle funding to help local governments carry out their solid and hazardous waste management plans including recycling, household hazardous waste collection, and solid waste enforcement. Grants awarded from these funds began July 1, 2013. These grants also fund organics composting and conversion, green building, moderate risk waste practices, waste reduction and recycling, and commercial outreach. Ecology awarded 123 grants to Washington counties, cities, and health agencies totaling $28,240,000 during the regular cycle.

2013-15 Regular Cycle Highlights

During the 2013-15 Grant Cycle, Thurston County not only diverted organics from the waste stream, but also utilized viable food to feed the hungry as a higher priority than composting.

The Food Bank remodeled existing rooms and purchased equipment to create a certified repack station that would accommodate converting donations from restaurants, grocery distributors, caterers, and one school cafeteria (a pilot) into individual, complete meals. They purchased a van and equipped it with a refrigeration unit, which allowed for expanding the type of donated food to be picked up.

Offset Cycle

Unrequested funds from the $28.2 million fund the competitive Offset Cycle. Ecology will award Offset Cycle grants of approximately $1 million on July 1, 2014 and continue through June 30, 2015.

Local Government Efforts Implementing Beyond Waste Vision Using CPG Funds

Local governments are carrying out programs that support the State Solid and Hazardous Waste Plan (Beyond Waste) vision. Examples of current projects are described below.

Waste Reduction and Recycling

Local governments provide residential and commercial recycling, technical help to businesses, recycling collection events, education programs, onsite waste audits, and recycling drop-off locations. These activities help support the vision of the State Solid and Hazardous Waste Plan (Beyond Waste) and increase Washington's recycling rate.

Hazardous Waste

Local governments help businesses and residents reduce and properly dispose of hazardous waste by building and maintaining hazardous waste collection facilities and conducting special collection events. Local governments also help small businesses with technical matters, promote use of less toxic products, and work with others to find solutions for problem wastes such as electronics and mercury.

Solid and Hazardous Waste Planning

Local governments work in cooperation with public officials, local solid waste advisory committees and the public to develop plans for their communities. These plans outline effective approaches to reduce their solid and hazardous wastes and safely manage the wastes that remain.

Solid Waste Enforcement

Local governments enforce the solid waste laws and local ordinances. They enforce them by permitting and inspecting facilities; responding to complaints about illegal dumping and improper waste handling or storage; and issuing citations.

To view details of completed projects funded by grants, visit the Solid Waste Information Clearinghouse at https://fortress.wa.gov/ecy/swicpublic/. Select "Projects" from the top blue bar. Scroll down and search by ensuring the checkbox for "CPG Funding" is selected, and enter the following dates in the "Dates Project Active" fields: 1/1/2012 to 12/31/2013. Scroll down and click "Search." You will notice there are also many other ways to search for projects from this page.

CPG Offset Cycle Improvements Using the CPG Workgroup

The W2R Program has formed a CPG Workgroup comprised of one SWI grant recipient and one SWE grant recipient from each of Ecology's four regions across the state to represent CPG recipients. In addition to reviewing and commenting on the 2013-15 CPG Guidelines, the Workgroup examined the competitive CPG Offset Cycle grant program and made recommendations for process improvements. In particular, the workgroup worked on setting priorities for the types of projects to fund and on scoring criteria for evaluating the applications submitted. The CPG Workgroup will be consulted in the future as other issues and projects are identified where stakeholder input is needed.

CPG to Join the Grants and Loans Program to Participate in the New Ecology Administration of Grants and Loans (EAGL) Process

EAGL is a comprehensive web-based grant and loan management system that allows Ecology's grant and loan clients to complete grant applications, submit payment requests with progress reports, submit closeout reports, and request amendments online. The system provides a streamlined application and reporting process for both external clients and Ecology staff. In addition, as a paperless system, both natural resources and shipping costs are saved. CPG recipients in the 2015 Regular cycle will apply online with the EAGL system.

Grants to Citizens - Public Participation Grants (PPG)

Purpose

Washington's *Chapter 170.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act* provides for a PPG Program. PPGs provide funding to citizen groups and not-for-profit public interest organizations. These grants encourage public involvement in monitoring cleanup of contaminated sites and pollution prevention through waste reduction/elimination. A PPG can fund up to $120,000 for a two-year project and there is no requirement for matching funds. There are two types of PPG Projects:

1. *Contaminated Site Projects* encourage public involvement in investigation and cleanup of contaminated sites. Examples include:

    - Conducting public walking tours of the Anacortes Bay Wide cleanup site.

    - Developing a school curriculum regarding the Hanford cleanup site and its history.

    - Providing health advisories to ethnic communities regarding Spokane River contamination.

2. *Waste Management Projects* encourage public involvement to eliminate or reduce waste. Examples include:

   - Providing information on recycling and sustainability to low-income communities.
   - Introducing biochar technology and its applications to rural communities.
   - Educational campaigns to keep toxic materials out of Puget Sound.

Fiscal Year 2013

The PPG Program concluded the 2011-13 funding cycle. Due to budget cuts, there were only 15 contaminated site grants awarded out of 40 grants that were initially selected. No waste management grants were awarded.

Fiscal Year 2014

The PPG Program received $3.53 million for the 2013-15 Biennium. The funding allowed PPG to award 22 contaminated site grants and 20 waste management grants. Sixteen of the twenty-two contaminated site grants were awarded to 2011-13 grant recipients. New cleanup sites covered by PPG include Lake Washington, Magnuson Park, Bellingham Bay, March Point Landfill, and the Boeing Fabrication Plant (Algona).

Table 2.6
PPG Projects for 2011-13

Organization	County	Purpose	Funding Awarded
Friends of Skagit Beaches	Skagit	Provide public education and outreach regarding the Anacortes Bay Wide cleanup.	$90,000 (11-13) $116,000 (13-15)
Hanford Challenge	Statewide	Improve and expand understanding of Hanford issues, and provide meaningful public engagement.	$90,000 (11-13) $120,000 (13-15)
Columbia Riverkeeper	Statewide	Provide public education and outreach regarding the Hanford cleanup.	$90,000 (11-13) $120,000 (13-15)
Washington Physicians for Social Responsibility	Statewide	Statewide public education about Hanford in order to promote public participation in Hanford cleanup decision making.	$120,000 (11-13) $120,000 (13-15)
Citizens for a Healthy Bay	Pierce	Engage the public in protecting the health of Commencement Bay through education.	$52,000 (11-13) $78,000 (13-15)
Georgetown Crime Prevention and Community Council	King	Provide public education and outreach regarding the Phillips Services Georgetown cleanup site.	$50,000 (11-13) $50,000 (13-15)
Olympic Environmental Council	Clallam	Engage and educate the public regarding the Rayonier Mill and Port Angeles Harbor cleanup and restoration.	$50,000 (11-13) $88,000 (13-15)

Organization	County	Purpose	Funding Awarded
The Lands Council	Spokane, Stevens, and Lincoln	Involve ethnically diverse members of the public on Spokane River cleanup and restoration.	$42,000 (11-13) $55,000 (13-15)
Institute for Neurotoxicology and Neurological Disorders (INND)	King and Snohomish	Identify sources of potentially unhealthful toxics and odor from large-scale compost operations.	$48,000 (11-13) $70,000 (13-15)
Heart of America NW Research Center (HOANWRC)	Statewide	Provide information and citizen participation opportunities focused on the cleanup of Hanford. 13-15 grants cover two separate Hanford sites.	$120,000 (11-13) $110,000 (13-15) $115,000 (13-15)
Brackett's Landing Foundation	Snohomish	Encourage community involvement in cleanup decisions at the UNOCAL/Chevron site.	$40,000 (11-13) $49,000 (13-15)
Lake Roosevelt Forum	Lincoln, Stevens, Ferry, and Grant	Improve community engagement and understanding of Lake Roosevelt RI/FS.	$45,000 (11-13) $46,000 (13-15)
People for Puget Sound (Futurewise in 13-15)	Snohomish	Provide education and outreach regarding the Port Gardner Bay cleanup to community members.	$70,000 (11-13) $100,000 (13-15)
Duwamish River Cleanup Coalition	King	Provide education and outreach regarding the Duwamish River cleanup.	$95,000 (11-13) $120,000 (13-15)
New PPG Projects 2013-15			
Contaminated Site Grants			
HOANWRC	Statewide	Provide education and outreach regarding the US Ecology-Hanford cleanup site.	$75,000
HOANWRC	King	Provide education and outreach regarding the Lake Washington and Magnuson Park cleanup sites.	$80,000
RE Sources for Sustainable Communities	Whatcom, Skagit	Provide education and outreach regarding the March Point Landfill and Bellingham Bay cleanup sites.	$76,000
Futurewise	King	Provide education and outreach to Algona residents regarding the Boeing Fabrication Plant cleanup site.	$120,000
HanfordLearning.Org	Statewide	Develop classroom curriculum on the Hanford cleanup site.	$108,000
Waste Management Grants			
Spokane River Forum	Spokane, Stevens, Lincoln	Spokane River waste and toxics reduction education and outreach.	$51,000
INND	Statewide	Northwest Children's Environmental Health Forum.	$30,000

Organization	County	Purpose	Funding Awarded
Spokane Neighborhood Action Partners	Spokane	Living green sustainability education and outreach.	$80,000
Sustainable Obtainable Solutions	Okanogan, Ferry, Stevens, Pend Oreille	Introduce biochar technology and applications to rural communities.	$115,000
Nisqually River Foundation	Thurston, Pierce, Lewis	Storm water runoff pollution education.	$88,000
Environmental Coalition of South Seattle	Snohomish	Small business pollution prevention education and outreach.	$65,000
Port Townsend Marine Science Society	Jefferson	Toxics reduction in storm water runoff educational displays.	$90,000
Sustainable Resources INW	Statewide	Create a byproduct synergy network of industries and institutions.	$108,000
YMCA of Greater Seattle	King, Snohomish	Earth Service Corp.	$60,000
Zero Waste Washington	King	Neighborhood lending library for durable products.	$84,000
Zero Waste Washington	King	Child car seat recycling program.	$53,000
Facing the Future	Statewide	Hanford student educational curriculum.	$94,980
Yakima Valley Habitat for Humanity	Yakima	Increase contractor participation in Habitat for Humanity stores.	$80,000
Seattle Tilth Association	King	Household waste reduction education and outreach.	$100,500
Network for Business Innovation and Sustainability	Statewide	Byproduct synergy education and outreach.	$114,000
YMCA of Pierce and Kitsap Counties	Pierce, Kitsap	Puget Sound outdoor education program.	$110,000
Habitat for Humanity-Seattle	King	Green building education and outreach.	$109,500
Puget Soundkeeper Alliance	Statewide	Marina pollution prevention education.	$60,000
Just Health Action	King	Environmental Justice education.	$40,000
Salish Sea Expeditions	Puget Sound	Sound & Source education program.	$60,000
Pacific NW Pollution Prevention Resource Center	King, Snohomish	Auto shop waste reduction education and outreach.	$54,000
Puget Creek Restoration Society	Pierce, King	Puget Sound storm water pollution education.	$55,000
Total for 2013-15 Biennium			**$3,528,584**

Partnering for the Environment through Local Planning

Local solid waste planning is the cornerstone of solid waste management in Washington State. The Legislature asks counties and cities to make sound decisions about solid waste handling based on approved and "current" comprehensive solid waste management plans *(RCW 70.95.110(1)).*

Comprehensive plans detail all solid waste handling facilities within a county. The plans estimate the long-range needs for solid waste facilities over a 20-year period. The state intended these plans to guide a county as it lays the foundation for its solid waste system. Since 1989, the state has required counties and cities to provide detailed information on waste reduction strategies and recycling programs, along with schedules to carry out the programs. They are to maintain the plans in "current condition."

In 1985, the Legislature amended the *Hazardous Waste Management Act, Chapter 70.105 RCW* to require local governments, or a combination of neighboring local governments to prepare plans to manage moderate risk waste (MRW). By 1991, all local governments submitted local hazardous waste plans. Every local hazardous waste plan includes parts on MRW public education, MRW enforcement, household hazardous waste (HHW) collection and technical and disposal assistance to conditionally exempt small quantity generators (CESQGs).

In 1991, the Legislature enacted the *Used Oil Recycling Act, Chapter 70.95I RCW,* which required local governments to amend their hazardous waste plans to include used motor oil from households.

Since their hazardous waste plans were completed, some counties have revised them. Some have combined their solid waste and hazardous waste plans. One recommendation of the State Solid and Hazardous Waste Plan (Beyond Waste) is to fully implement local hazardous waste plans.

In 2010, Ecology updated the *Guidelines for the Development of Local Solid Waste Plans and Plan Revisions* and the *Guidelines for Developing and Updating Local Hazardous Waste Plans.* Both documents and other planning information are available at http://www.ecy.wa.gov/programs/swfa/localplan.html.

Ecology provides technical assistance to local governments as they prepare and carry out their plans, and also approves them. Coordinated Prevention Grants (CPG), discussed earlier in this chapter, provide funds for both planning and implementation programs. Table 2.7 lists the current status of local solid waste plans and hazardous waste plans for each county, and one city (Seattle) that does individual plans.

Table 2.7
Current Status of Solid & Hazardous Waste Plans
in Washington as of December 2013

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Adams	2005	50% WR/R BY 2012	1992	No	Comprehensive Solid Waste Management Plan (CSWMP) updated April 2005.
Asotin	2011	No specific number mentioned.	1993	No	Approved April 2011.
Benton	2007	50% by 2020	1991	Yes	The preliminary draft for the 2013 Benton County CSWMP has been submitted and is currently being reviewed.
Chelan	2007	25% recycling rate by 2010 5% reduction from the current waste stream by 2010	1990	Yes	Drafting for new CSWMP anticipated beginning in 2014.
Clallam	2007	40% WRR long-term goal	2007	No	A CSWMP draft expected in January 2014.
Clark	2008	50% WRR	2008	Yes	A CSWMP preliminary draft expected in late 2013.
Columbia	2003	20% WR/R	1991	No	CSWMP approved. HW Plan being split from joint plan with Walla Walla and written as new standalone for Columbia County. Consultant hired, SWAC reconstituted. Preliminary plan update in process.
Cowlitz	2012	At or above 50% WRR	2012	No	CSWMP approved August 2012.
Douglas	2010	10% residential recycling, 10% commercial recycling, and 20% public sector recycling by 2015	2010	Yes	CSWMP approved October 2010.
Ferry	2011	30% Recycling by 2015	2011	Yes	Plan completed and approved 2011.
Franklin	2011	References state goals but doesn't commit to a number of their own.	2011	Yes	Plan approved March 2011.
Garfield	2008	No specific number commitment.	1992	No	CSWMP approved September 2008.
Grant	2008	40% in five years	1992	No	Part of a combined Grant-Adams-Lincoln Counties MRW plan that hasn't been followed for a decade or longer.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Grays Harbor	2013	50% WRR	2013	Yes	CSWMP approved January 2013.
Island	2008	Assist the State in achieving its goal of 50%	2008	Yes	Updated plan is currently under Ecology review.
Jefferson	2008	50% WRR	1991	No	Planning a review of the CSWMP and the HW plan in 2014.
King	2002	50% residential by 2006 43% nonresidential by 2006	2010	No	CSWMP draft update went out for public comment on October 8, 2009. The preliminary draft was submitted to Ecology on April 1, 2011. The CSWMP is currently with the Executive's Office; however, due to potential changes in the transfer system plan, it may need another update before submitting a final to Ecology. Because the city of Seattle and King County have independent CSWMPs, the HW plan remains independent. The HW plan was approved July 2010.
King - Seattle	2013	Overall recycling rate by 2015: 60% Overall recycling rate by 2022: 70%	2010	No	Because the city of Seattle and King County have independent CSWMPs, the HW plan remains independent and is administered by the Local Hazardous Waste Management Program. The HW plan was approved July 2010. The final CSWMP update was approved June 2013.
Kitsap	2011	Supports the state goal of reaching 50% recycling.	2011	Yes	The final combined CSWMP/HWMP update was approved June 2011.
Kittitas	2012	Countywide recycling rate of 50%. Supports the state goal of reaching 50% recycling.	1991	Yes	Final CSWMP approved July 2012.
Klickitat	2013	Countywide recycling and diversion goal of 50%.	2000	Yes	Final CSWMP approved April 2013.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Lewis	2008	50% WRR	2008	Yes	A CSWMP update expected in 2014.
Lincoln	2011	Commits to assisting the state to meet its 50% goal.	2011	Yes	Plan approved March 2011.
Mason	2007	Mentions state goal of 50%	1991	Yes	A preliminary draft CSWMP is expected in 2014.
Okanogan	2012	Supports the state goal of reaching 50% recycling	2006	Yes	Final CSWMP approved October 2012.
Pacific	2006	25% WRR goal	1990 – 2000 Operations Plan	Yes	A preliminary draft CSWMP expected in 2014.
Pend Oreille	2011	References state goal w/o committing to a number of their own.	2011	Yes	Plan approved January 2011.
Pierce	2008	50% WRR	1990	No	CSWMP update is currently on hold.
San Juan	2012	50% recycling rate by 2018	2012	Yes	
Skagit	2005 (amended 2008)	50% diversion	1992	No	Has just started update process for CSWMP. No plans to update HW plan.
Skamania	2001	50% WRR long range goal	2001	Yes	A draft CSWMP update is expected in 2014.
Snohomish	2013	Supports the state goal of reaching 50% recycling.	1993	Yes	The final combined CSWMP/HWMP update was and approved November 2013.
Spokane	2011	Commits only to working toward state goal of 50%. Currently at 46%	1993	No	Approved April 2011. The regional system described in this plan terminates November 2014. County Utilities is gearing up to take lead in running the county's solid waste system. The system is currently operated by a subdivision of the city of Spokane Solid Waste Division under an interlocal agreement. City of Cheney and city of Spokane Valley may opt to write their own plans under 70.95.080 (3)(a) RCW.
Stevens	2006	36% WR/R by 2012	1993	No	SWAC currently reviewing for update determination.
Thurston	2013	Increase recycling rate by5%	1993	No	A new HWMP is expected in 2014. A review of the CSWMP will begin in 2014.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Wahkiakum	2007	20% WRR	2001	No.	A CSWMP update expected in 2014.
Walla Walla	1994	40% by 2002	1991	No	City of Walla Walla administers a county-wide plan under an interlocal agreement. The plan was updated, and preliminary draft is currently under public review. Expect official submission by end of 2013.
Whatcom	2010	50% diversion	2010	Yes	New combined SW-HW plan approved 2010, but dated 2008. Will undertake a plan update soon.
Whitman	2012	No recommendation.	2012	Yes	Plan approved July 2012.
Yakima	2010	Support the state's recycling goal of 50%	2010	Yes	Plan approved June 2010.

*Combined plans approved prior to 2010 are not considered full revisions of the Local Hazardous Waste Management Plan (LHWP). New planning guidelines were published in 2010 that define a clear process for incorporating LHWPs into Comprehensive Solid Waste Management Plans. Combined plans approved after 2010 are required to meet the planning requirements prescribed in 70.105 RCW & 70.95I RCW. All other combined plans prior to 2010 were only approved in accordance with the solid waste planning requirements prescribed in 70.95 RCW, thus are not official LHWP updates.

Outreach, Assistance, and Information Sharing

Washington State Solid Waste Information Clearinghouse

In 2004-06, a committee of several local government staff worked with Ecology to plan and develop the information sharing website. The Information Clearinghouse allows Coordinated Prevention Grant (CPG) recipients to report work accomplished online and share project information, lessons learned, and materials produced (posters, reports, videos, etc.) with anyone who has Internet access. Access to each other's work gives all local governments the opportunity to strengthen and coordinate their programs. The system can also collect basic information about county and city programs.

The main audience for this site is local government solid and hazardous waste and health department staff. The Information Clearinghouse includes:

- State Profile.
- County and City Profiles.
- Local Projects.
- Outreach Materials & Other Resources.

The year 2013 marked the fourth anniversary the completed site was operational (https://fortress.wa.gov/ecy/swicpublic/). As of October 2013, the site had 219 registered users and contained 1,280 posted (publicly viewable) projects, 1,448 posted resources, 265 solid waste staff contacts, and 106 health department staff contacts.

The challenge of getting the local city and county profiles populated with data remains. This relies on a partnership between Ecology and local governments, as each is responsible for updating various pieces of the profiles.

In the coming year, Ecology will analyze the use of the Clearinghouse, get stakeholder input, and consider how this tool could be better utilized and become the resource local governments envisioned nearly a decade ago. One item to consider is how the role of the Clearinghouse might change as the CPG program gears up for its shift to online reporting via the new Ecology Administration of Grants and Loans (EAGL) system.

To provide feedback about the Information Clearinghouse, contact Diana Wadley, Project Coordinator, at (425) 649-7056 or Diana.Wadley@ecy.wa.gov.

Landfill and Incinerator Operator Certification Programs

Washington State law requires solid waste landfills and incinerators to have certified operators onsite at all times (*Chapter 70.95D RCW, Solid Waste Incinerator and Landfill Operators*). The Legislature created the Landfill and Incinerator Operator Certification program in 1989 through the *Waste Not Washington Act.* To carry out the law, the state adopted a rule in June 1991 (*Chapter 173-300 WAC, Certification of Operators of Solid Waste Incinerators and Landfill Facilities*).

The requirement to have certified operators onsite at all times applies to the following types of facilities:

- Municipal solid waste landfills.
- Inert landfills.
- Limited purpose landfills.
- All incinerators that burn solid waste.

The law also requires that any person officially inspecting these solid waste facilities be a certified operator.

Originally, Ecology developed the course curriculum and administered the tests. Because of staff and budget reductions, in February 2004 Ecology reached an agreement with the Solid Waste Association of North America (SWANA) to conduct training, testing, continuing education, recertification, and program administration for landfill certification. SWANA annually provides Ecology with a list of currently certified persons. The incinerator certification program continues to be Ecology's responsibility.

In 2012, Washington had 173 active operator/inspector landfill certifications (up from 108 in 2011). We also had 68 active operator/inspector incinerator certifications (down from 76 in 2011).

One of the concerns with the current certification program is the focus on national issues and regulations. There is no specific focus on Washington requirements. The SWANA curriculum focuses on topic areas such as landfill siting and surveying that do not add to compliance or environmental protection.

There are also issues with cost and travel restrictions for local governments with increasing budget restrictions. For some it would be beneficial to obtain certification for operators and inspectors without traveling or taking a test.

Also, many landfill operators do not have the math skills to pass a SWANA test, even though they are quite capable of safely operating a landfill and compliant with applicable rules. There has been interest in developing a different program for certification.

Ecology, health districts, and counties will work, as time and resources allow, to develop their own curriculum and program, and offer training and testing. This would give an alternate path to operators and inspectors to obtain certification and meet requirements of our rule.

Recycling Information Line

The W2R Program operates a statewide website and toll-free information line to help citizens find ways to reduce waste and recycle. While many local governments operate information lines in their own areas, the statewide information line continues to serve as the primary waste reduction resource site for most Washingtonians.

Ecology's 1-800-RECYCLE hotline provides callers with information on general recycling locations, specialized recycling opportunities (including one-time collection events), and targeted waste streams like mercury-containing items. The E-Cycle Washington (electronics recycling) Program continues to use the information line for guiding the public to local electronics recycling locations.

The hotline is currently coordinating with the new Mercury Lights Program to assist the public in finding convenient drop-off locations for their mercury lights. The hotline is also a source for locations to recycle wood stoves for programs that Ecology's Air Quality Program implements.

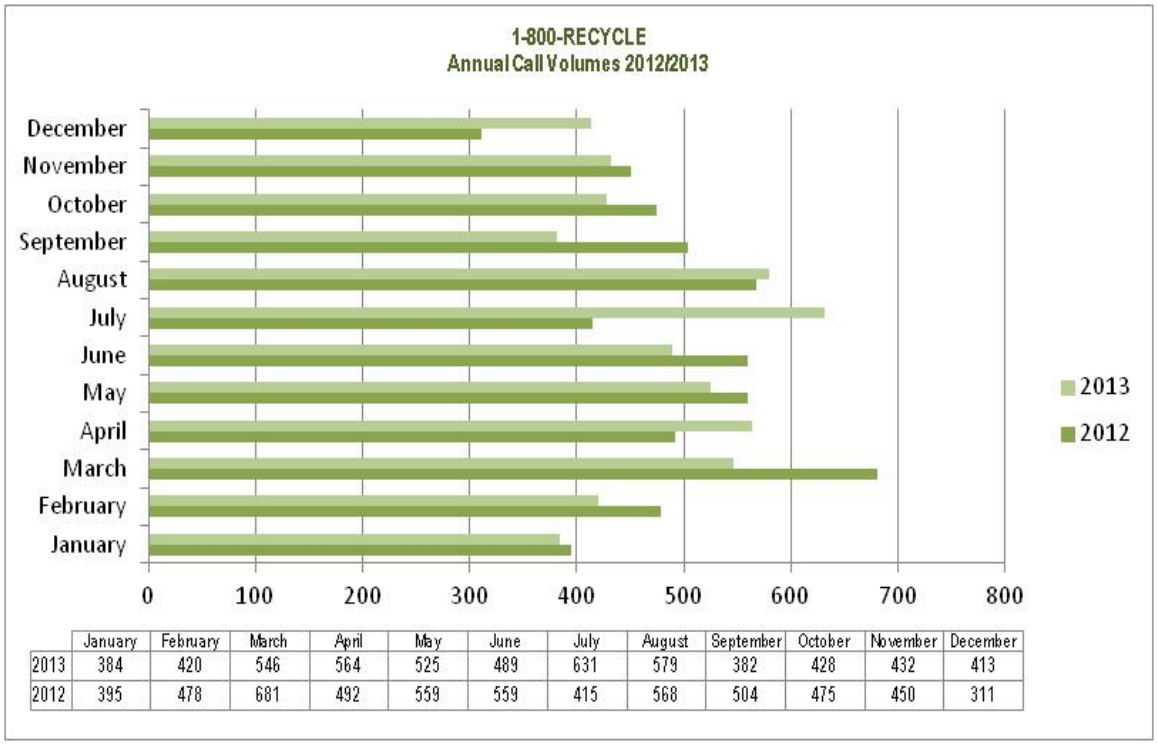
Hotline operators use a database to direct callers to locations for safe disposal of household hazardous waste and recycling facilities across the state. The database provides information on a wide variety of recyclable materials, including:

- Construction, demolition, and land clearing debris.
- Used motor oil.

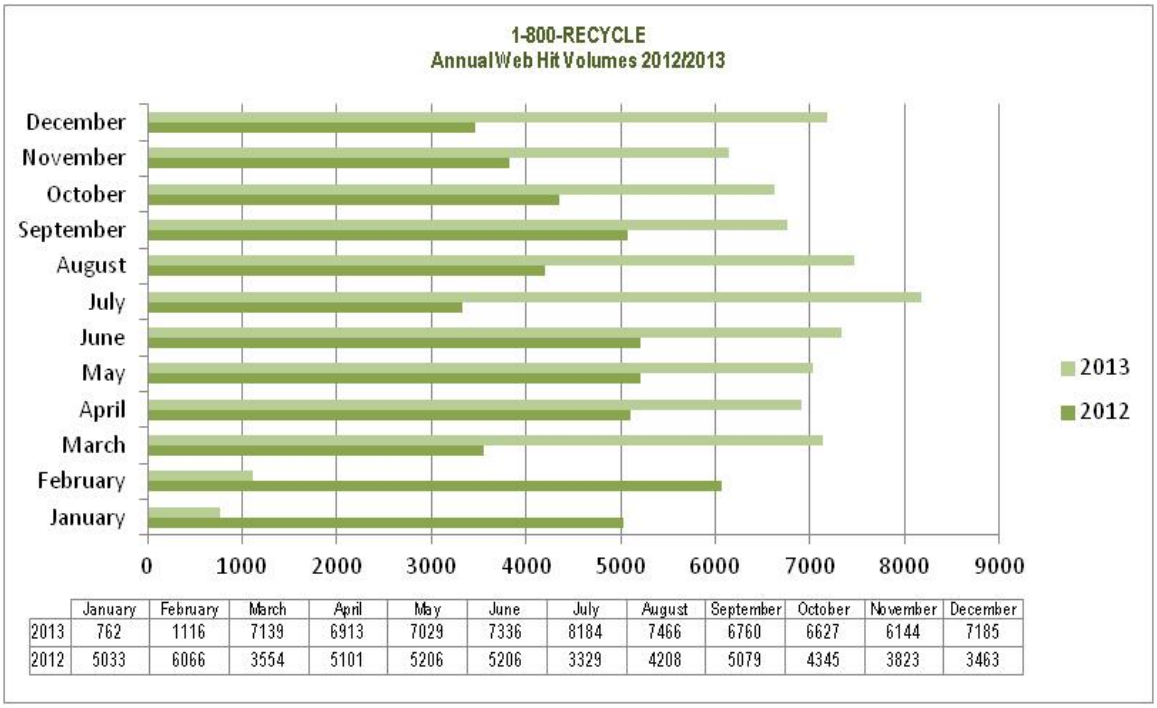
- Electronics.
- Pharmaceuticals.

The database also lists companies that offer commercial pickup for business recycling and residential curbside haulers.

The majority of the public receives recycling information by searching the database on the 1-800-RECYCLE website at http://1800recycle.wa.gov. The amount of traffic on the website has nearly doubled since the last year, and hotline staff has invested resources in improving the website's functionality. One key improvement is a recent update that allows searches by zip code, which helps callers find more convenient recycling locations.



	January	February	March	April	May	June	July	August	September	October	November	December
2013	384	420	546	564	525	489	631	579	382	428	432	413
2012	395	478	681	492	559	559	415	568	504	475	450	311



	January	February	March	April	May	June	July	August	September	October	November	December
2013	762	1116	7139	6913	7029	7336	8184	7466	6760	6627	6144	7185
2012	5033	6066	3554	5101	5206	5206	3329	4208	5079	4345	3823	3463

Ecology staff maintains the database by routinely analyzing recyclers' websites and recording changes. Hotline staff will occasionally contact recyclers to determine commodities handled, location (or areas served), and hours of operation. The website also provides links to other online databases and material exchanges, along with local government and recycling organization websites.

The 1-800-RECYCLE website also includes a web page developed for kids of all ages. The Kids Page at http://www.ecy.wa.gov/programs/swfa/kidspage/ has clever links to other environmental education sites and fun environmental games to play. It also has interesting trivia facts on different recyclable materials.

Chapter 3: Statewide Litter Prevention & Cleanup Programs

Chapter 70.93 RCW, *the Waste Reduction, Recycling, and Model Litter Control Act*, assigns Ecology lead agency status to manage statewide litter programs. Since 2010, work on litter control and litter prevention activities has been significantly reduced due to budgetary constraints. We have been unable to fund a litter prevention campaign or conduct a litter survey. Available funds for litter pickup efforts are reduced. With the continued reduced funding, Ecology put forward the following efforts in litter control and pickup:

- Helped coordinate litter pickup activities. Managed allocations from the Waste Reduction, Recycling and Litter Control Account (WRRLCA) for other state agencies.
- Deployed 28 summer Ecology Youth Corps (EYC) litter cleanup crews statewide. Also deployed 6 Ecology median crews in spring and fall and two median crews in summer.
- Administered the Community Litter Cleanup Program (CLCP).
- Maintained productive partnerships with other state agencies and local governments.

The 2013 Legislature again reduced funding from WRRLCA for the 2013-15 Biennium. Funding for litter pickup for this biennium is being directed to the Department of Corrections (DOC), Department of Natural Resources (DNR), and Ecology (EYC) only. Other impacts to the litter program include:

- No funds to carry out the litter prevention campaign.
- No funds to conduct the statewide litter survey.
- No staff for the Litter Hotline to respond to citizen complaints about litter.
- No staff or funds to fulfill public requests for litter and secured loads materials.
- No funds for litter efforts by the departments of Fish and Wildlife (WDFW), Transportation (WSDOT), and State Parks and Recreation Commission (Parks).

Litter Prevention Campaign

There was no funding or staff to implement a comprehensive prevention campaign in 2012 or early 2013. There is no funding or staff to support a prevention campaign for the 2013-15 Biennium.

Secured Load Materials and Website

There was no secured loads campaign in 2012 or early 2013 other than the enforcement activity described below. There is no funding for a secured loads campaign in 2013-15. The litter website is still operational, but we have informed readers that many of the activities described on the website are currently suspended.

Enforcement Activities

In May 2011, WSP conducted litter enforcement patrols along the I-5 corridor and in Spokane. The 2011 effort lasted four weeks, with law enforcement officers logging approximately 650 hours, making 534 litter educational contacts which resulted in 112 litter citations.

There was no litter emphasis patrol in 2012 and 2013. There are no plans for a litter emphasis patrol in 2013-15.

Litter Hotline Program

The Litter Hotline is a toll-free phone line (1-866-LITTER-1) for the public to report littering incidents they witness, such as a person throwing something out the window of a vehicle or an item falling from an unsecured load.

Because of the budget reduction to WRRLCA, starting in July 2011 Ecology suspended answering the hotline. The hotline now has a recorded message for callers:

> *"Thank you for calling the 1-866-LITTER-1 reporting line. Due to state budget cuts, we are now unable to accept reports on witnessed littering events. We hope that this service might be restored in the future, but for now it has been suspended. If this is an emergency regarding a dangerous unsecured load, please hang up and dial 911. And thank you for doing your part to keep Washington clean."*

Ecology is no longer sending letters to litter violators. Ecology's "Litter and It Will Hurt" signs remain on the state's highways as a visual reminder to the public to not litter. The litter hotline still receives between 200 and 250 calls per month due to these signs being up.

Litter Program Fund Allocation

The Legislature cut the 2011-13 WRRLCA budget by $10 million and suspended the 20/30/50 allocation requirements for Fiscal Year 2011-13. In the 2013-15 budget, $10.7 million was swept from the account to Parks for maintenance and operations of state parks. The 20/30/50 allocation parameters were restored.

WRRLCA supports a variety of programs. The fund's 20/30/50 allocation is as follows:

- $1.82 million to Local Government Funding Programs.
- $2.74 million to Ecology Waste Reduction & Recycling Activities.
- $4.56 million to Ecology and other State Agency Litter Cleanup & Prevention Activities.

Continued funding cuts will result in more litter created and less litter picked up. Some specific results of the cuts include:

- Ecology worked at a reduced level of effort with our summer EYC.
- Ecology suspended most of the Litter and it will Hurt campaign. Only the roadway signs and an edited Ecology-hosted website remain to inform state residents about littering. We no longer answer the litter hotline, and there is no way for the public to report littering incidents.
- WSP still enforces state litter laws, but there are no Ecology funded emphasis patrols for the upcoming biennium that focus on litter violations and secured loads.
- Ecology reduced funding to DNR and DOC, and cut funding completely to WSDOT, WDFW, and Parks (for litter pickup).

Ecology Youth Corps

2012 marked the 37th year of operation for the EYC. The EYC website at www.ecy.wa.gov/programs/swfa/eyc/index.html includes regional hiring information, applications, and photos of the EYC in action.

RCW 70.93.020 requires creation of "*jobs for employment of youth in litter cleanup and related activities.*" The EYC operates two types of crews: youth and median. Youth crews operate in the summer months (June - August). Most median crew activity occurs in the spring and fall, with reduced median crew activity in the summer.

Youth crews consist of members 14-17 years old. They mostly clean shoulder areas and interchanges of major state routes and interstates. More than 3,400 youths from across the state apply annually for approximately 250 positions in summer 2012. In 2013, we saw 3,119 applications come in and hired 293 youth. Youth crews typically work two four-week summer sessions with a complete turnover of crews occurring mid-summer. However in recent years we have run some crews at three weeks each to stretch our dollars and get more youth job experience.

During the 2012 EYC crew season, litter on state highways was collected in the following counties:

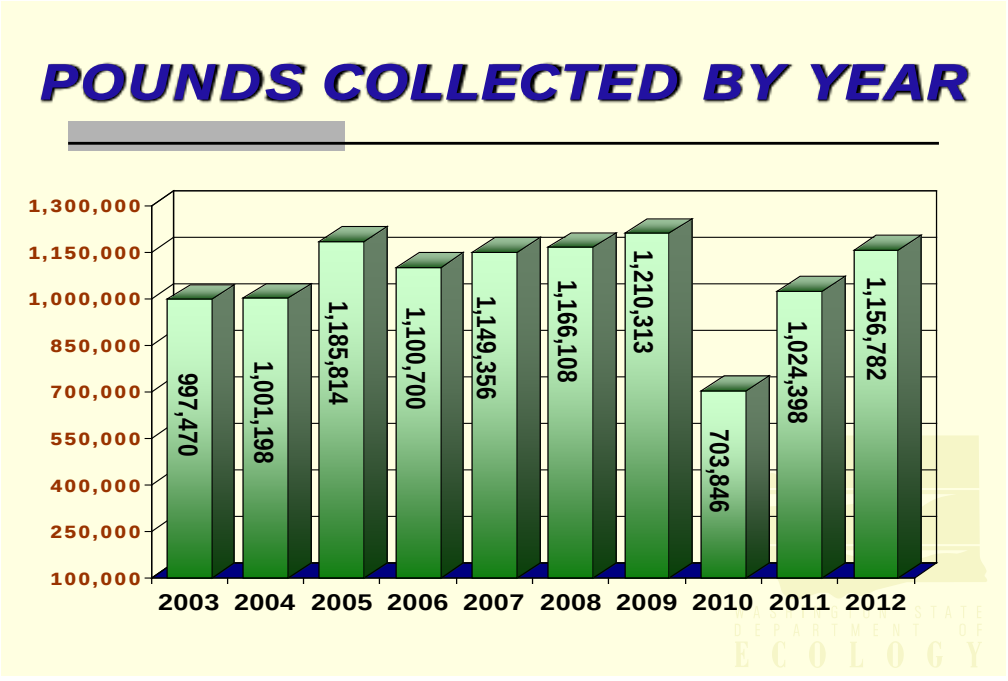
- ✓ Central Region (CRO): Benton, Kittitas, Klickitat, and Yakima.
- ✓ Eastern Region (ERO): Adams, Asotin, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla and Whitman.
- ✓ Northwest Region (NWRO): King, San Juan, Skagit, Snohomish, and Whatcom.
- ✓ Southwest Region (SWRO): Pierce, Thurston, Grays Harbor, Cowlitz, Clark, Mason and Lewis.

The most recent totals for the EYC program are for the 2012 crew season.

Table 3.1
Ecology Youth Corps Program Outputs

	Jan-Dec 2012
Total Hours Worked (Supervisor + Crew)	76,537
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,159,067
Miles	6,364
Acres	646
Number of Illegal Dumps Cleaned	197

Figure 3.1



Litter Survey

Ecology's goal is to conduct a litter survey every five years to measure the amount and types of litter around the state. Ecology cancelled the 2008-09 Litter Survey because of budget cuts. There was no funding in 2011 or 2012. Because of the continued budget reduction to WRRLCA for 2013-15, there is still no funding to conduct a litter survey. Information on previous litter studies are on the litter webpage at http://www.ecy.wa.gov/programs/swfa/litter/public.html#a1.

Community Litter Cleanup Program

In 1998, Ecology created the Community Litter Cleanup Program (CLCP) with the goal of providing financial assistance to local governments to combat litter and illegal dumps on roadways and other public land. CLCP contracts are written on a biennial schedule (two-year period from July-June). The contracts are a key component of statewide litter and illegal dump cleanup programs.

Most local governments participating in CLCP use in-custody (jail) or community service crews to do litter cleanup work. The use of these crews provides significant savings to local jails and returns labor value to communities that participate. Several jurisdictions also use volunteer groups to assist in cleanup and or educational efforts.

Table 3.2 highlights the work accomplished through CLCP for 2012.

Table 3.2
Community Litter Cleanup Program Outputs

	Jan–Dec 2012
Total Hours Worked (Supervisor + Crew)	104,581
Total Pounds Collected (Litter + Illegal Dump + Recycled)	2,039,835
Miles	19,995
Acres	1,795
Number of Illegal Dumps Cleaned	3,535

The CLCP has $1.824 million available for the 2013-15 Biennium, about $1.1 million less than fully funded years.

Litter Cleanup by Other State Agencies

Because of Legislative reductions to the WRRLCA for 2011-13, state agencies saw a decrease in funding from previous years. Additional budget reductions to WRRLCA for 2013-15 have further impacted state agency litter pickup budgets. WDFW, WSDOT, and Parks were eliminated from the budget. DNR was reduced to $200,000. DOC was reduced by $200,000 to $420,000. Table 3.3 shows the budget for three biennia.

Table 3.3
Ecology Interagency Agreements for Litter Activities
July 1, 2009 – June 30, 2015

	2009-11 Biennium	2011-13 Biennium	2013-15 Biennium
Department of Corrections	$620,000	$620,000	$420,000
Department of Fish and Wildlife	$ 20,000	$0	$0
Department of Natural Resources	$415,000	$320,000	$200,000
Department of Transportation	$ 85,000	$ 0	$0
Parks and Recreation Commission	$ 40,000	$ 0	$0
Total	$1,180,000	$940,000	$620,000

Parks and Recreation Commission

Because of the continuing budget reductions to WRRLCA for 2013-15, Parks again is not receiving any funding for litter pickup for the biennium.

Department of Fish and Wildlife

Because of the continuing budget reductions to WRRLCA for 2013-15, WDFW again is not receiving any funding for the biennium.

Department of Corrections

DOC receives funding from Ecology to run community based correctional litter crews on state roads, state lands, and in local communities. The funds support crews in Seattle, Tacoma, Monroe, Wenatchee, Ellensburg, Yakima, the Tri-Cities, Moses Lake, Spokane, and Everett. Table 3.4 summarizes DOC's litter crew activity in 2012. DOC was granted $620,000 for 2011-13. This allowed DOC to fund up to 1649 days for the biennium.

Table 3.4
Department of Corrections Litter Removal Activity

	Jan-Dec 2012
Total Hours Worked (Supervisor + Crew)	40,791
Total Pounds Collected (Litter + Illegal Dump + Recycled)	653,539
Miles	2,429
Acres	78
Number of Illegal Dumps Cleaned	1

For the 2013-15 Biennium, funding for DOC was reduced to $420,000 or 1117 days.

Department of Natural Resources

DNR Camps Program, in partnership with DOC, puts offender crews to work on state lands. As illustrated by Table 3.5, this program has considerable impact on litter cleanup and illegally dumped materials in state-owned forests. For the 2011-13 Biennium, DNR's litter funding was reduced by $95,000 to $320,000. Table 3.5 summarizes DNR crew activity in 2012.

Table 3.5
Department of Natural Resources Litter Removal Activity

	Jan-Dec 2012
Total Hours Worked (Supervisor + Crew)	30,336
Total Pounds Collected (Litter + Illegal Dump + Recycled)	368,422
Miles	2,469
Acres	363
Number of Illegal Dumps Cleaned	701

Because of the budget reduction to WRRLCA for 2013-15, DNR's funding was further reduced to $200,000.

Department of Transportation

WSDOT is responsible for picking up litter along state roads, including bags of litter collected by Adopt-a-Highway groups, the EYC, and DOC.

In 2012, WSDOT crews removed and disposed of 3,037.5 tons of litter from state roadways (roughly six million pounds).

Because of the budget reduction to WRRLCA for 2013-15, WSDOT did not receive any funding for the biennium.

Looking Ahead

The 2013-15 Biennium is as challenging as it was in 2009-11 and 2011-13. Coordination of litter pickup efforts by the various state agencies needs to continue to be strong to achieve the greatest efficiencies. We will continue to evaluate all programs for the best return on the money and effort spent.

Chapter 4: Solid Waste Generation, Disposal & Recycling in Washington State

Preventing wastes in the first place, rather than managing them at the end of the pipe, is key to carrying out the State Solid and Hazardous Waste Plan (Beyond Waste). Recognizing we will continue to generate some wastes, the Plan calls for valuing these materials as resources and moving them into closed-loop recycling systems, or diverting them for other uses instead of disposing them.

To measure progress toward Beyond Waste goals, a record of the amount and types of waste generated is necessary. To determine the amount of waste generated in Washington State each year, Ecology uses the total amount of materials disposed, plus the amount of materials recycled and diverted from disposal. The way we calculate this number is changing as we gain more understanding of the waste stream and get better information on how wastes are managed.

The total amount of waste generated each year increased until 2005. After decreasing every year from 2006-09, the amount of waste generated increased in 2010 before dropping again in 2011 and 2012. This may indicate we are on our way to improving this trend.

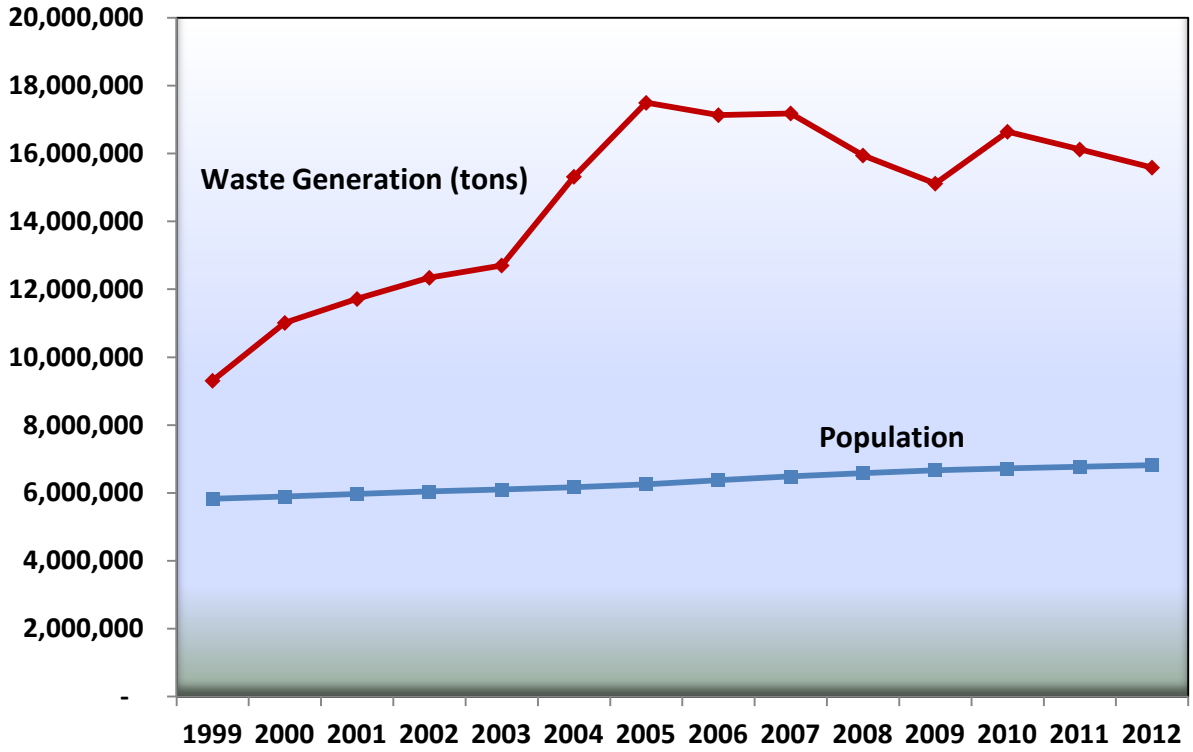
Washington State's population has continued to grow since Ecology began to track disposal and recycling. Population growth rates in Washington have averaged 1.7 percent per year from 1988 to 2012, with the total population increasing more than 2.2 million during that period.[1]

With an increase in population often comes an increase in waste generation and this was the case in Washington in the past. However, more recently, overall waste generation has decreased, falling by nearly two million tons since 2005 (see Figure 4.1).

Since 1994, when Ecology began measuring the disposed solid waste stream by tracking annual report data from disposal facilities such as landfills and incinerators, the amount of waste generated per person has grown at an average annual rate of 3 percent. That number dropped to 1.5 percent growth over the last decade and has actually fallen by 2.7 percent annually since 2006.

[1] Population figures from Office of Financial Management at http://www.ofm.wa.gov/

Figure 4.1
Solid Waste Generation and Population Growth in Washington



Determining the Amount of Waste Generated

Total waste generation is determined by adding the amount of waste disposed to the amount of material recycled and diverted from disposal. It is easy to see why materials sent to landfills and incinerators are considered waste, but materials separated for recycling or other useful activities are also part of our total waste generation. These materials enter the stream of discarded materials that will not be used again in their original form, hence the term "waste," even though they will be put to better uses than landfilling.

Ecology is currently measuring six types of final disposal and waste management:

1. Disposal in regulated landfills.

2. Combustion of mixed municipal solid waste (MSW) in regulated incinerators.

3. Combustion of source separated material (burning for energy) in regulated industrial incinerators.

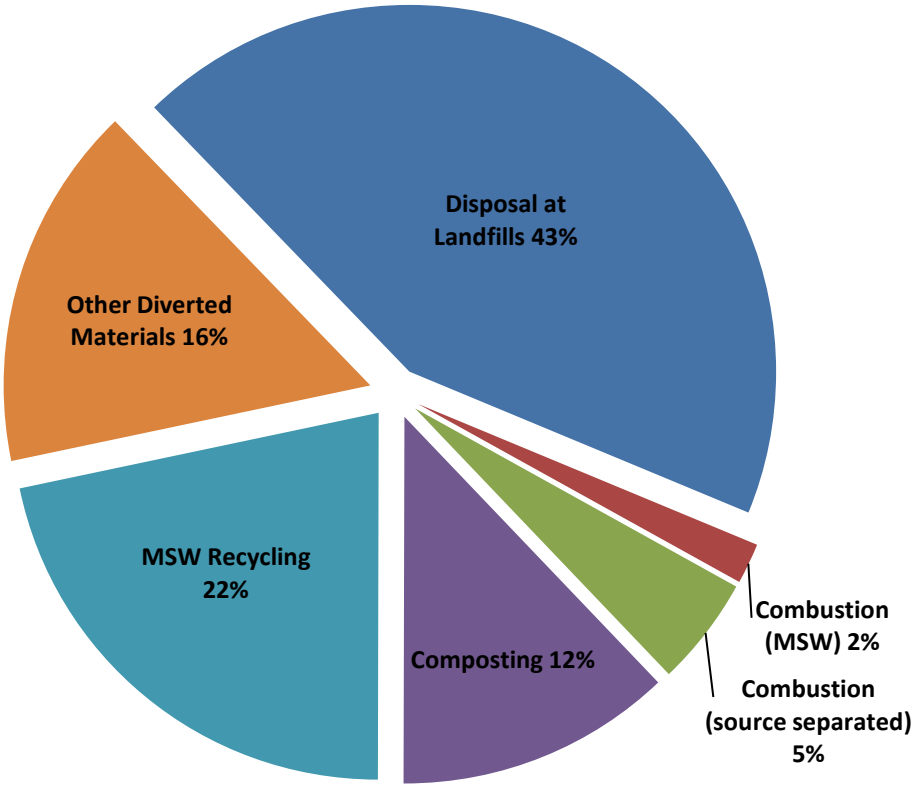
4. Composting in regulated facilities.

5. Recycling (transforming material into the same or other products – MSW only) in regulated and non-regulated facilities.

6. Other Diversion (includes recycling of non-MSW materials and reuse) in regulated and non-regulated facilities.

Figure 4.2 shows a breakdown of the statewide waste management methods in 2012.

Figure 4.2
Waste Management Methods 2012



Some material types have one unique final use, such as aluminum cans that are recycled back into more aluminum cans. However, there is often more than one final use for a material reported as recycled or diverted, depending on market shifts and demand. For example, some wood collected for recycling may be used to make composite lumber, some may be composted, and some burned for energy recovery.

In 2006, Ecology began asking for a more detailed breakdown of these uses for all materials reported. Data quality is improving as recyclers develop systems to track this type of information.

For many years, the largest measured part of Washington's waste generation number was the disposed waste stream. This number increased over the long-term, but has decreased in recent years. The overall long-term increase could be occurring for several reasons. In some cases, we are simply throwing away more. Because of reporting requirements adopted in 2003 in *Chapter 173-350 WAC, Solid Waste Handling Standards*, we are getting more details from facility annual reports on wastes we dispose. We are also getting information on waste disposal in other states (for example, waste tires generated in Washington that are disposed in Oregon and some other states).

We currently include all materials disposed in landfills that may not have been reported as waste materials in the past. Examples are clean soil and rock, which are not defined as solid waste by our regulations, but disposed as waste or used as alternative daily cover at a landfill. Another example is All Shredder Residue (ASR), also known as "auto fluff." This material, counted as disposed by Ecology's disposal reports, may be used as alternative daily cover depending on the landfill permit.

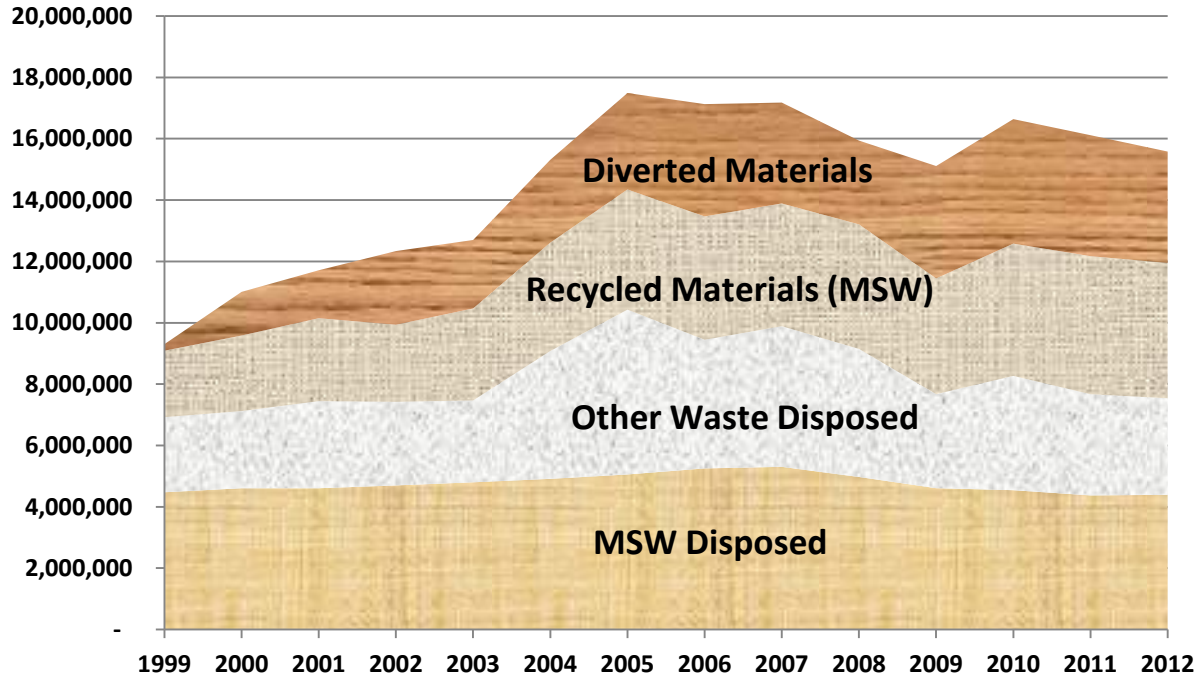
The other measured part of Washington's waste generation number is comprised of materials recycled and diverted from disposal. The reported list of materials included as recycling and diversion has increased over time. Since 1986, Ecology has largely followed EPA guidance when defining municipal solid waste recycling.

In 1999, along with MSW recycling, sometimes referred to as traditional recycling, we started tracking other materials diverted from disposal. We now track materials reported as diverted from the waste stream, but outside the state's definition of municipal or traditional recycling. This expanded measure of recycling that we call waste diversion includes recyclables such as construction and demolition debris, materials burned for energy recovery, and reused materials. As more types of materials are diverted from disposal, the list of items will increase.

We are continuing to increase our efforts to get better reporting from recyclers and those who divert waste from disposal. Due to Ecology tracking additional materials, and improved reporting from recyclers, as well as actual increases in recycling and diversion, the total tonnage reported has increased over time. In 2005, the total annual waste generation in Washington reached a maximum of 17,494,320 tons, decreased through the recession to 15,114,973 tons, increased to 16,643,568 tons in 2010, and then decreased to 16,119,679 tons in 2011, and 15,589,498 tons in 2012.

Figure 4.3 shows the categories of solid waste tracked by Ecology under the broad categories of municipal solid waste (MSW) disposed, other waste types disposed, MSW recycled, and solid waste diverted from disposal (such as recycled construction and demolition materials).

Figure 4.3
Total Solid Waste Generation in Washington (Tons)



Per Capita Waste Generation

In addition to looking at the overall picture of total waste generation, it is important to evaluate the amount of waste we produce in Washington on an individual basis or per capita. That means the amount of waste generated by each person each day.

The recycling rate in the MSW Section looks at the municipal portion of the waste stream, or waste generated in households and businesses. It includes such items as durable and nondurable goods, containers, packaging, food waste, and yard debris. It does not include industrial waste; inert debris; asbestos; biosolids; contaminated soils; or construction, demolition, and land clearing debris. MSW or materials in the first category are sometimes called traditional recycling. Materials in the second category diverted from disposal and combined with the traditional materials make up the diversion rate.

Per capita numbers from for the MSW stream are shown in Table 4.1. Residents and businesses in the state generated 7.08 pounds MSW per person per day in 2012. 3.53 pounds were disposed and 3.55 pounds were recovered for recycling. For per capita MSW numbers for 1986 – 2012, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.1
Municipal Solid Waste Disposed, Recycled & Generated
(Pounds/Person per Day)

Per Capita MSW Only	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
MSW Disposed	4.32	4.37	4.43	4.52	4.48	4.14	3.79	3.71	3.54	3.53
MSW Recycled	2.69	3.14	3.43	3.46	3.38	3.38	3.10	3.51	3.64	3.55
MSW Generated	7.01	7.51	7.86	7.97	7.86	7.52	6.89	7.22	7.19	7.08

MSW is only a portion of the waste produced in the state. Waste is also generated during activities such as manufacturing, construction projects, demolition, and environmental cleanup.

To determine the total waste generation, we add *all* of the materials recycled, diverted, and disposed. This includes MSW disposed and all other waste types disposed at landfills and incinerators, plus recycled and diverted materials. The result is a much higher generation number for the state – 12.53 pounds per person per day, with 6.46 pounds recycled/diverted and 6.06 pounds disposed (Table 4.2).

Table 4.2
All Solid Waste Disposed, Recycled/Diverted and Generated
(Pounds/Person per Day)

Per Capita Solid Waste	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Disposed[2]	6.71	8.07	9.14	8.12	8.36	7.64	6.31	6.74	6.22	6.06
Recycled/ Diverted	4.70	5.54	6.18	6.60	6.16	5.65	6.11	6.82	6.83	6.46
Generated	11.41	13.61	15.32	14.72	14.51	13.29	12.42	13.56	13.05	12.53

The total waste generation numbers include all waste – households, businesses, industries, and other manufacturing activities in our state. They also include wastes cleaned up from our environment, like contaminated soils from leaking gas tanks at service stations, asbestos removed from buildings that are torn down or remodeled, and contaminated soils dredged from Puget Sound. No higher or better uses of waste from environmental cleanups have been identified at this time, so they should be disposed in a landfill.

Much of the total waste stream is wastes that could be recycled or reused, or not created in the first place. These are wastes we need to focus prevention and reduction efforts on as described in the state's Solid and Hazardous Waste Plan (Beyond Waste). We want to see less waste in the categories of municipal and commercial solid waste, industrial waste, construction and demolition waste, inert waste, wood waste, other organic wastes, and tires.

2 Disposed amounts include all waste generated from Washington disposed in MSW, limited purpose, and inert landfills and incinerators, both in-state and exported.

Waste Disposed by Washington "Citizens"

As part of the annual reporting requirements of *Chapter 173-351, Criteria for Municipal Solid Waste Landfills* and *Chapter 173-350 WAC, Solid Waste Handling Standards*, all landfills and energy recovery facilities report the source, types, and amounts of waste received from their county, other counties, other states, or other countries. We also include data for what is disposed from Washington State in three municipal solid waste landfills in Oregon (Finley Butte, Wasco, and Columbia Ridge).

In 2012, a total of 7,530,188 tons were disposed. Table 4.3 shows the amounts and general types of waste disposed of since 2000 by Washington citizens[3]. Spreadsheets identifying the disposal location, type, and amount of waste for each county for 1994 - 2012 are at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[3] "Citizens" in this chapter does not only refer only to an individual, but includes business, industry, public and private sectors - anyone who produces waste.

Table 4.3
Waste Disposed by Washington Citizens

Waste Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
MSW/ Commercial	4,610,914	4,611,406	4,703,879	4,805,202	4,917,870	5,060,502	5,258,076	5,309,296	4,978,497	4,614,045	4,548,275	4,377,843	4,396,880
Demolition	685,799	759,586	835,400	650,473	884,567	1,014,526	1,127,022	1,085,977	857,135	672,067	617,817	631,248	674,480
Industrial	157,634	563,249	546,299	743,042	1,356,415	1,092,305	512,277	530,835	361,017	277,691	446,521	279,215	270,862
Inert	19,542	428,789	321,451	280,358	419,115	1,337,372	1,029,559	1,402,421	1,362,143	552,682	986,335	525,016	571,325
Wood	197,929	246,754	91,697	90,303	89,905	61,918	52,833	40,579	39,926	29,449	8,822	9,726	23,828
ASH (other than SIA)	N/A	N/A	N/A	N/A	536,651	420,222	148,545	88,093	76,943	129,072	189,626	164,340	131,438
Sludge	95,050	1,473	1,762	22,835	10,171	12,458	33,490	30,432	35,682	16,550	1,985	419	480
Asbestos	11,777	10,929	11,177	15,455	18,252	21,951	29,700	103,686	11,914	12,654	12,683	13,677	11,898
Petroleum Contaminated Soils	284,778	616,725	784,703	568,681	489,385	957,788	740,341	735,773	1,057,069	786,762	766,381	582,541	741,542
Other Contaminated Soils	N/A	N/A	N/A	N/A	146,554	231,428	225,488	321,762	125,440	327,918	448,486	764,481	133,885
Tires[4]	40,908	7,752	4,919	22,226	15,212	22,446	33,698	50,704	25,541	28,834	23,275	14,156	14,866
Medical	6,349	5,255	2,417	2,498	2,624	2,651	2,899	3,998	3,013	2,983	11,618	7,064	8,252
Other	178,156	198,259	124,512	270,992	196,793	197,010	256,627	189,316	250,656	226,601	210,758	307,046	564,007
Total[5]	**6,288,836**	**7,450,177**	**7,428,216**	**7,472,065**	**9,083,516**	**10,432,576**	**9,450,554**	**9,892,871**	**9,184,975**	**7,677,306**	**8,272,583**	**7,676,711**	**7,530,188**

[4] In 2003 started adding tires that were reported disposed out-of-state.
[5] In 2001 started reporting waste disposed in all types of landfills and energy recovery facilities.

In 2012, there was an overall decrease in the amount of all solid waste disposed by Washington State citizens. There were increases in municipal/commercial, demolition, inert, wood, petroleum contaminated soils, medical waste, tires, and other wastes. Decreases were seen in asbestos, non-incinerator ash, other contaminated soils, industrial, and wood categories. In addition to waste reduction and recycling efforts in those categories, the sluggish economy and limited building and development may have also accounted for reduced disposal in those categories.

The types of wastes reported by landfills are very general, since the waste arrives in mixed loads and often in closed containers. It is difficult to know exactly what types of materials are included. For example, municipal solid waste as reported by disposal facilities includes anything a household or business throws away. We do not know exactly how much of that waste is paper, food, cans, plastics, bottles, or other recyclable materials, or who actually produced the waste (a household or a business).

We also do not know the specific content of wastes reported as industrial or inert. It would benefit waste reduction and recycling efforts for a particular type of waste or waste producer to have more details. Rigorous sampling studies, such as a waste characterization study, provide information to estimate the content of disposed waste.

The most recent of these studies, the *2009 Washington Statewide Waste Characterization Study*, was completed in June 2010. A comprehensive analysis of the overall waste stream and the commercial, residential, and self-hauled sectors is addressed in the study at http://www.ecy.wa.gov/biblio/1007023.html.

As we continue to implement the State Solid and Hazardous Waste Plan (Beyond Waste), specific information on the contents of our waste is essential to understanding the makeup of the solid waste stream. This helps us focus efforts to eliminate and reduce specific types of wastes or materials, and to measure our progress.

Municipal Solid Waste (MSW) Generation, Recycling & Disposal

The discussion of the solid waste generation, disposal, recycling, and diversion totals in the previous section includes *all* types of waste disposed, composted materials, source-separated materials burned for energy, and non-municipal solid waste diverted from disposal or recycled. The following discussion is of the narrower subset of recycling, disposal, and generation measures that include *only the MSW stream*, or discards from households and businesses.

In 1989, the Washington State Legislature amended the *Solid Waste Management Act* (Chapter 70.95 RCW) to set a state recycling goal of 50 percent by 1995. The 50 percent rate refers to the MSW recycling rate. To determine this rate and ensure consistency and comparability with past years, Ecology has measured a specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as MSW by the Environmental Protection Agency.[6]

The law also states that recycling should be at least as affordable and convenient to citizens as garbage disposal. In response, local governments put various forms of recycling in place, ranging from drop boxes to curbside collection of a variety of recyclable materials.

Despite the efforts citizens, government, and industry made, the state did not reach the 50 percent goal by 1995. In 2002, the Legislature amended the law and pushed the 50 percent goal to 2007, which the state did not meet until 2011. Legislators also set a goal to establish programs to eliminate yard waste in landfills by 2012.

Although Washington did not achieve the legislative goals by the set dates, the recycling rate increased steadily as infrastructure and markets developed. In 2012, 87.4 percent of the state's population had access to curbside recycling for materials such as paper, plastic, and metals. This was an increase from 86.5 percent with access to curbside recycling in 2011, and an increase over the original 82 percent when first measured in 2000. Despite the economic recession that caused severe cutbacks to the recycling infrastructure on the local government level, citizens recycled at a higher rate than in 2010. In 2011, Washington's recycling rate grew to its highest level ever at 50.7 percent, surpassing the 50 percent goal set by the Legislature. The recycling rate fell to 50.1 percent in 2012, yet remained above the 50 percent goal for the second year in a row.

Ecology measures MSW recycling by quantifying the MSW materials recycled and dividing that by the total MSW generation (recycling plus disposal). State regulation requires landfills and incinerators to report municipal solid waste separately from other wastes, specifying county of origin, which provides a reliable data source for the denominator.

Recycling Rates for MSW

Ecology has conducted a survey every year since 1986 to measure the statewide recycling rate for MSW. Information comes from local governments, haulers, recyclers, brokers, and other handlers of materials from the recyclable portion[7] of the waste stream.

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[6] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and land clearing debris disposed at municipal solid waste landfills and incinerators.

[7] *Ibid.*

From 1986 to 1995, the measured statewide recycling rate increased from 15 percent to 39 percent. This increase was steady, with minor variations. In 1996, the rate dropped to 38 percent. The 1997 recycling rate dropped again to 33 percent because of the poor paper fiber market in Asia and a continued glut in the metals market. Table 4.4 shows MSW recycling rates for 1986 - 2012.

The poor paper and metal market trend continued in 1998, but improved enough to raise Washington's recycling rate to 35 percent. Although markets improved in 1999, the tonnage disposed increased enough to drop the recycling rate to 33 percent.

Table 4.4
MSW Recycling Rates in Washington

1986	15%
1988	28%
1989	27%
1990	34%
1991	33%
1992	35%
1993	38%
1994	38%
1995	39%
1996	38%
1997	33%
1998	35%
1999	33%
2000	35%
2001	37%
2002	35%
2003	38%
2004	42%
2005	44%
2006	43%
2007	43%
2008	45%
2009	45%
2010	49%
2011	51%
2012	50%

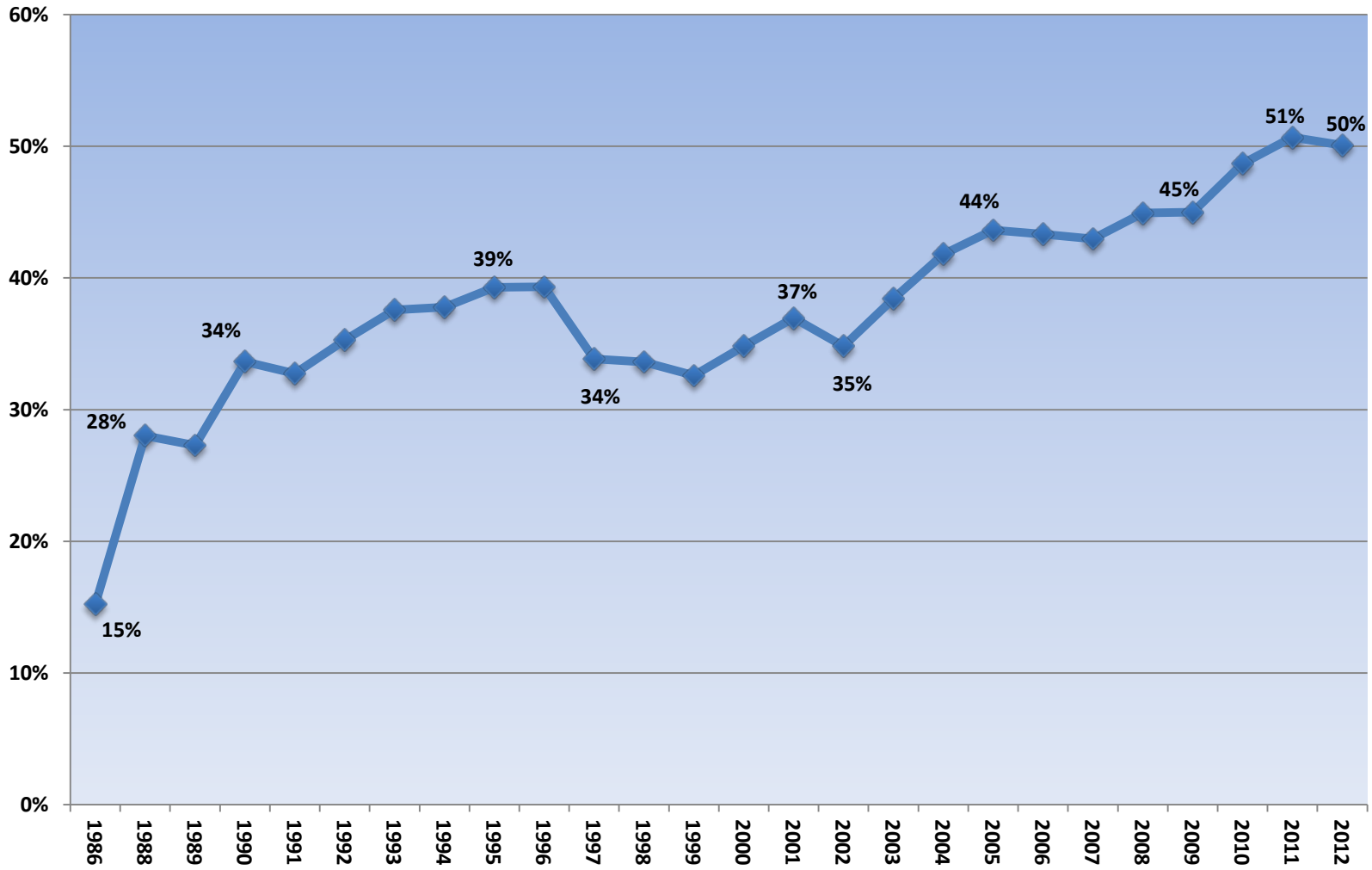
Markets continued to improve in 2000, raising the recycling rate again to 35 percent. Although markets for most materials fell in 2001, the increased activity and better reporting for key materials brought the rate to 37 percent. Drops in market conditions for paper, glass, and yard debris, combined with low reporting for food waste and a difference in how wood waste categories are calculated, brought the rate down to 35 percent for 2002.

In 2003, the reporting requirements for recycling facilities changed with *Chapter 173-350 WAC, Solid Waste Handling Standards.* These changes resulted in better reporting of recyclables. In addition, market demand for ferrous and nonferrous metals was high during 2003, which helped bring the recycling rate up to 38 percent. With the continued strong reporting of recyclables collected along with market increases for metals, paper, and yard debris, the MSW recycling rate hit 42 percent in 2004, and continued to climb to 44 percent in 2005.

In 2006, the recycling rate dropped slightly to 43 percent and remained unchanged in 2007. The economic recession that began around 2008 brought a reduced disposal rate; that and continued good recycling habits boosted the recycling rate to 45 percent in 2008, where it remained in 2009. In 2010, MSW disposal decreased again while recycling increased, bringing the recycling rate up to 49 percent. In 2011, this trend continued, resulting in a 51 percent recycling rate, the highest rate ever. MSW recycling and diversion both decreased in 2012, and the recycling rate fell slightly to 50.1 percent (see Figure 4.4). Detailed data on materials recovery since 1986 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

The Beyond Waste Progress Report also provides quantitative information on specific wastes such as organics, construction and demolition debris, and electronics, as well as the economic and environmental impacts of recycling. See http://www.ecy.wa.gov/beyondwaste/bwprog_front.html.

Figure 4.4
Washington State MSW Recycling Rate - 1986 to 2012



As of 2012, about 87 percent of the state's population had access to curbside recycling services, which are intended to be as convenient as disposal. Most of the people who do not have curbside services *do* have access to drop box recycling. The state's population is growing, having added one million people since 1999. Ecology believes newcomers, as well as longtime residents need ongoing education and advertising to learn to recycle or continue to do so.

Many curbside programs in the state are changing to commingled or single-stream (mixed) collection systems to reduce costs and increase collection of recyclables. This trend became more evident in 2003, as new sorting facilities and procedures began operation, and has continued through 2012. Some evidence suggests the convenience of not having to sort recyclables leads to more participation in recycling programs. In most cases, programs that changed to commingled collection also increased the range of materials collected; however, the act of mixing or commingling the recyclables can create a higher residual rate because of the difficulty of cleanly sorting the materials. Those residuals are then disposed.

Compared to source-separated collection programs, the commingled programs have collected about ten percent more material. The results are also mixed where end markets are concerned. While the amount by weight collected in the recycling system is staying steady, a June 2010 Ecology report indicates that a certain amount of the residential commingled recycling does not get recycled. Between 5 and 20 percent of some materials may not ultimately be recycled into new products. Such materials are either materials that the market cannot recycle yet and are collected anyway, or do not make it through the sorting system to the appropriate market. See *Beyond the Curb – Tracking the Commingled Residential Recyclables from Southwest Washington* at http://www.ecy.wa.gov/biblio/1007009.html.

Ecology is making an effort to quantify these residuals, and determine the impact on the recycling and diversion data through annual reports from material recovery facilities and the recycling survey. Further studies are needed including sampling at recycling facilities to more accurately determine the level of contaminants in the incoming materials stream and residuals in the outgoing materials stream at recycling facilities.

Measurement Methodology

The Legislature requires Ecology to measure recycling activities each year and report the results. From 1986 until 2002, the only tool used was the annual recycling survey. Beginning in 2003, recycling facilities and intermediate solid waste handling facilities were required to submit annual reports under *Chapter 173-350 WAC, Solid Waste Handling Standards*. Annual reports for facilities are mandatory and they be penalized for not submitting a report.

Recycling facilities, other firms involved in recycling (such as brokers), haulers, and local governments submit information about the types and quantities of recyclable materials they collected. Although the recycling survey is mandatory, there is no penalty for not returning the information, and not all businesses respond. Others respond with estimates of the amount and origin of materials. These factors offer challenges to compiling good county-specific recycling and diversion information.

To fill the gaps on reporting forms, Ecology cross-checks data through phone calls and e-mails to reporting facilities, end-users of the recyclable materials, other recycling facilities, other intermediate collectors of recyclables, and local governments. Other data sources are used to round out data gaps and check reported information, such as the data collected through E-Cycle Washington, the state's electronic waste product stewardship program. The data is also cross-checked with past years' aggregate data by material, county, and individual company.

Ecology also adjusts the collection numbers for materials that are reported as commingled. This practice began with 2009 data by applying a contamination rate based on local government sampling data. This method did not account for the residual material that is not sorted or is sorted incorrectly. For the 2011 analysis, Ecology began using another method to adjust the commingled data based on data from the *Beyond the Curb* report, and other local government and industry data. Ecology estimates how much of the commingled stream is made up of incoming contaminants and residuals left by the sorting systems, and subtracts that from the total amount reported. The adjusted number is then separated by material based on the percentage of material typically found in a commingled system.

Finally, Ecology checks figures against double-counting by verifying exchange of materials between reporting entities. Companies are asked to report the destination of materials and final use on their surveys and forms. This data is verified by correspondence with the reporting facility, destination facility, and local government or industry to the extent possible. The destination data makes it possible to track materials as they move from facility to facility, allowing Ecology to remove instances where the materials are counted more than once.

Ecology bases the reliability of the results on review of draft numbers sent to local governments, comparisons to past recycling, waste characterization and disposal data, and industry and end-user information.

Both the recycling survey and the annual reporting forms are available on Ecology's website. Respondents can print and complete the forms, or download, complete electronically, and e-mail them to Ecology. Ecology maintains a solid waste facilities database as a central location for tracking recycling survey and annual report facilities, contact information, and data.

Results – 2012 MSW Recycling

To consistently compare results from year to year, Ecology includes basically the same materials it has used since 1986 to calculate the MSW recycling rate. These materials originate from the MSW stream Ecology defined when designing the recycling survey in the mid-1980s. Table 4.5 provides tonnage figures for each material that contributed to the MSW recycling rate from 2009-12.

Table 4.5
MSW Recycled Tonnage Reported
MSW Recycling Rates[8] 2009-12

Recycled Materials Reported (MSW)	2009	2010	2011	2012
Aluminum Cans	21,098	13,655	13,115	13,635
Appliances/White Goods	39,777	48,881	44,174	54,578
Batteries – Auto Lead Acid	21,493	26,986	27,297	23,356
Cardboard	491,266	471,477	542,333	520,585
Cartons	5,526	2,763	705	6,139
Container Glass	100,823	109,916	96,145	121,163
Electronics	22,190	25,569	31,148	38,237
Fats and Oils	92,345	91,050	128,511	86,864
Ferrous Metals	998,721	1,332,254	1,458,201	1,370,692
Fluorescent Light Bulbs	1,229	1,087	1,096	1,398
Food Scraps (post-consumer)	77,699	62,041	129,229	65,727
Gypsum	38,662	30,882	39,902	86,902
HDPE Plastics	13,876	18,824	12,475	16,864
High-Grade Paper	47,266	76,667	66,664	39,072
LDPE Plastics	15,407	16,772	27,024	23,375
Mixed Paper	274,982	287,814	280,055	293,424
Newspaper	267,524	233,924	275,025	170,088
Nonferrous Metals	142,931	123,680	146,164	121,711
Other Recyclable Plastics	12,524	13,009	18,194	18,367
PET Plastic Bottles	16,767	15,803	16,986	18,830
Photographic Films	354	433	2,074	117
Rubber Materials	8	10	n/a	n/a
Steel Cans	17,293	15,060	17,975	15,306
Textiles (rags, clothing, etc.)	16,445	24,976	25,580	41,688
Tires (recycled)	35,439	26,775	25,678	25,756
Used Oil	110,038	71,725	76,612	74,114
Wood Waste	200,980	347,137	178,403	244,907
Yard Debris	689,849	537,442	608,947	656,841
Yard Debris and Food (mixed)	n/a	285,965	209,364	261,221
Total MSW Recycled	**3,772,509**	**4,312,581**	**4,499,073**	**4,410,955**
Total MSW Disposed[9]	**4,613,329**	**4,548,275**	**4,377,843**	**4,396,880**
Total MSW Generated	**8,385,838**	**8,860,856**	**8,876,917**	**8,807,835**
MSW Recycling Rate	**44.99%**	**48.67%**	**50.68%**	**50.08%**

[8] Detail may not add due to rounding.

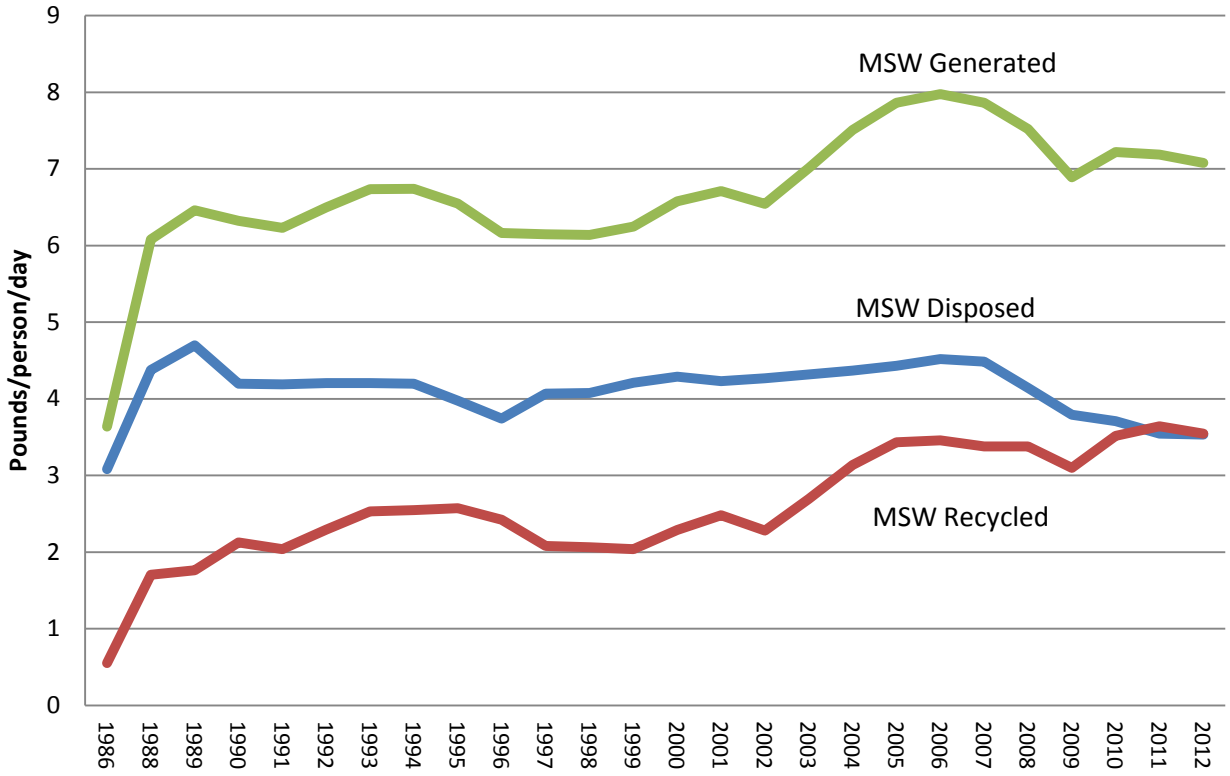
[9] The amount of MSW disposed represents only the quantity defined "recyclable portion" of the waste stream from municipal and commercial sources. It excludes the following waste types reported from landfills and incinerators: demolition, industrial, inert, wood, ash, sludge, asbestos, contaminated soils, tires, medical and other.

Individual Waste Generation for Municipal Solid Waste Stream

Each person contributes to the MSW stream by recycling and disposing of wastes from their household, school, workplace, and anywhere else solid waste is produced. The figures below represent only an average of the total contributions of all residents. Some people may contribute much more or less waste than others. Figure 4.5 shows an average of how each person in the state contributes to the MSW stream. The next section has a discussion of overall waste generation.

In 2012, each resident of the state generated 7.08 pounds of municipal solid waste per day, disposing 3.53 pounds per person. 3.55 pounds per person were recovered for recycling. In 2006, we reached an all-time high of per capita waste generation of 7.97 pounds per person per day. Since then, the waste generation has generally decreased, with only a slight increase from 2009-10 (see Table 4.6).

Figure 4.5
Pounds of MSW Disposed, Recycled
& Generated Per Person/Day
1986 - 2012



Washington residents create, recycle, and dispose of about two pounds of MSW per person above the national averages. We attribute this larger disposal number to Washington's larger amount of yard and wood waste than the national average, as well as our different method of measuring ferrous metals.

Comparing per capita numbers to other states' averages provides a check for Washington's recycling numbers. Additionally, at various points in the data gathering process, Ecology asks county recycling coordinators to check their county recycling and disposal numbers for accuracy. Ecology also checks the end-use information for recovered materials provided on the recycling surveys and annual reports to verify the classification as recycling, diversion, or disposal. This way, Ecology captures and measures any new recycling and diversion that occurs.

Table 4.6
Pounds MSW Disposed, Recycled and Generated Per Person/Day[10]
2001-12

MSW Per Capita	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Disposed	4.23	4.27	4.32	4.37	4.43	4.52	4.48	4.14	3.79	3.71	3.54	3.53
Recycled	2.48	2.28	2.69	3.14	3.43	3.46	3.38	3.38	3.10	3.51	3.64	3.55
Generated	6.71	6.55	7.01	7.51	7.86	7.97	7.86	7.52	6.89	7.22	7.19	7.08

[10] See the *Per Capita Waste Generation* section for per capita numbers that include diversion and all waste types.

Waste Recycled and Diverted from Disposal

Measuring Recycling and Diversion Rates

Since 1986, Ecology has calculated a consistent recycling rate that is comparable to past years by measuring the part of the waste stream known as MSW. Since the mid-1990s, Ecology has noted very large increases of material recovery in non-MSW waste streams. Most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and land clearing debris. The recovery of these materials for uses other than landfill disposal is called diversion.

Increasingly, Washington counties and cities have put efforts into recovering and recycling wastes that are outside the traditional MSW stream. The construction and demolition waste stream provides the best example. We are now recycling many of these materials, including asphalt, concrete, roofing material, lumber, various metals, and others. Knowledge of the non-MSW waste stream is increasing, and more materials are tracked as recyclers are discovering ways to divert this material from landfills.

Measuring diverted materials is as simple as collecting the number of tons of material diverted from landfills from the recycling and diversion facilities. Before 1999, many recycling survey respondents voluntarily listed this information on the recycling survey. In 1999 Ecology began asking recyclers to list and quantify the diverted materials on their reporting forms.

Ecology calculates a diversion rate (or recovery rate) in addition to the traditional MSW recycling rate. Calculating the diversion rate takes two steps. First, we measure non-MSW materials diverted from the waste stream along with MSW recyclables. Ecology then compares the resulting figure to total waste generation (minus a subset of landfilled materials that were not available for recycling or diversion).[11] Washington shows a diversion rate of 55 percent in 2012 (Table 4.7).

Table 4.7
Diversion Rates
1999 - 2012

Year	Diversion Rate
1999	28%
2000	37%
2001	41%
2002	45%
2003	46%
2004	49%
2005	48%
2006	50%
2007	47%
2008	47%
2009	55%
2010	54%
2011	57%
2012	55%

Wood waste makes up a large portion of the recovered materials stream in Washington. A major portion of recovered wood is eventually burned for energy recovery. A percentage of it is also being used in new wood and paper products, as a feedstock in composting operations, and as mulch. Although Ecology asks recycling facilities to report the final use of the material

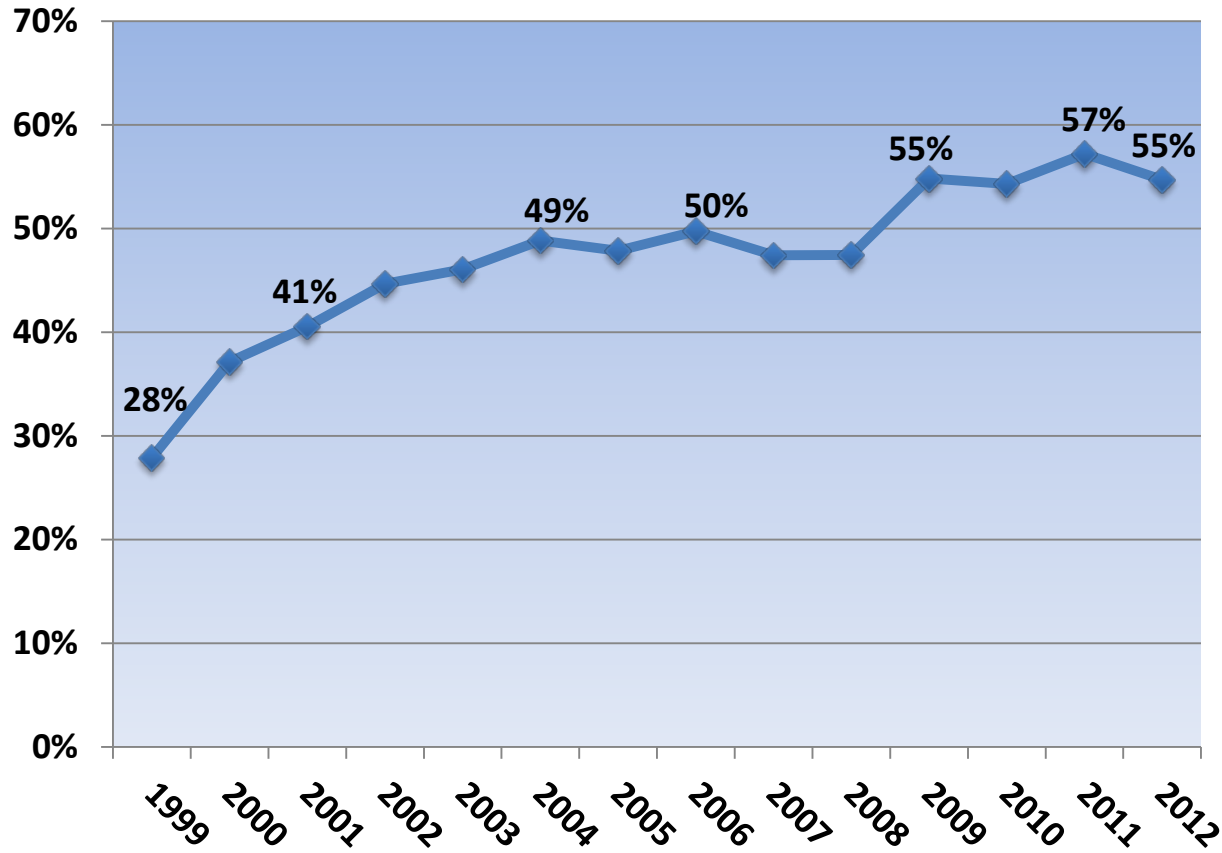
[11] Waste types used to calculate diversion include municipal, demolition, inert, industrial, wood, tires, medical and other. Excludes asbestos, sludge and contaminated soils.

(recycled, composted, burned for energy), facilities may not know the exact final use of the material. Therefore, an undetermined amount of the wood reported as recycled may actually be burned for energy recovery or used as hog fuel.

In agriculture, leftover organic materials are often composted and processed for land application as soil amendments. Ecology recognizes these and other uses of discarded material as potentially beneficial and includes them in the diversion numbers. In addition, waste materials such as manure that are processed by anaerobic digesters are counted as diverted.

Figure 4.6 shows the diversion rate in Washington since Ecology began measuring it in 1999.

Figure 4.6
Washington State Diversion Rates – 1999 to 2012[12]



We need to study the non-MSW waste stream in more detail. We lack information on the total volume of waste created, especially in the industrial sector. If a recycling facility has a solid waste permit or is conditionally exempt from permitting under *Chapter 173-350 WAC, Solid Waste Handling Standards*, they are required to report the annual quantities and county of origin

[12] Diversion rates are adjusted retroactively each year to reflect adjustments in recycling, diversion, and disposal data.

of solid waste recyclables collected or diverted from the waste stream. However, if the facility is not required to have a solid waste permit or conditional exemption from permitting, reports are voluntary, as with out-of-state facilities or recycling haulers with no fixed facility. This makes it difficult to calculate a recycling or diversion rate for many materials.

Results – 2012 Diversion

Diversion is the term used to measure more materials than the traditional MSW recycling rate. It continues to include the same materials used since 1986 to calculate the MSW recycling rate, and also includes the new materials described in the above section on Measuring Recycling and Diversion Rates; for example, construction and demolition debris and wood burned for energy recovery. Table 4.8 provides tonnage figures for each material included in the diversion rate from 2009-12.

Table 4.8
Diverted & Recycled Materials Reported (Tons); Diversion Rates

Diverted & Recycled Materials Reported	2009	2010	2011	2012
Agricultural Organics[13]	45,431	55,689	76,645	102,733
Aluminum Cans	21,098	13,655	13,115	13,635
Antifreeze	5,194	4,783	4,872	6,797
Appliances/White Goods	39,777	48,881	44,174	54,578
Ash, Sand & Dust used in Asphalt Production	344	20,364	-	-
Asphalt & Concrete	2,186,429	2,188,200	2,211,889	1,887,580
Batteries – Auto Lead Acid	21,493	26,986	27,297	23,356
Cardboard	491,266	471,477	542,333	520,585
Carpet and Pad	3,317	3,867	3,653	2,420
Cartons	5,526	2,763	705	6,139
Construction & Demolition Debris	302,836	269,603	271,716	399,209
Container Glass	100,823	109,916	96,145	121,163
Container Glass (used as aggregate)	-	3,212	19,966	20,116
Electronics	22,190	25,569	31,148	38,237
Fats and Oils[14]	92,345	91,050	128,511	86,864
Ferrous Metals	998,721	1,332,254	1,458,201	1,370,692
Fluorescent Light Bulbs	1,229	1,087	1,096	1,398
Food (recovered)	-	402	429	3,684
Food Processing Wastes (pre-consumer)	14,027	27,762	59,220	102,035
Food Scraps (post-consumer)[15]	77,699	62,041	129,229	65,727
Gypsum	38,662	30,882	39,902	86,902
HDPE Plastics	13,876	18,824	12,475	16,864
High-Grade Paper	47,266	76,667	66,664	39,072
Household Batteries	535	458	465	402
Industrial Batteries	99	1	1,620	1,582
Industrial Organics[16]	85,692	83,681	46,544	57,063
Industrial Paper	-	6,476	3,686	-
Land Clearing Debris	162,939	150,287	160,086	171,962
Land Clearing Debris for Energy Recovery	78,018	130,766	125,039	132,473
LDPE Plastics	15,407	16,772	27,024	23,375
Mattresses	-	-	1,213	852

[13] Prior to 2008, included in Other Organics category.
[14] Includes animal fat and used cooking oil collected for rendering or processing in commercial quantities. Prior to 2008, included in Food Scraps category.
[15] Prior to 2008, this category included fats and oils reported for recycling.
[16] Prior to 2008, included in Other Organics category, or classified as Wood Fiber/Industrial Paper.

Diverted & Recycled Materials Reported	2009	2010	2011	2012
Miscellaneous	13	57	510	589
Mixed Paper	274,982	287,814	280,055	293,424
Newspaper	267,524	233,924	275,025	170,088
Nonferrous Metals	142,931	123,680	146,164	121,711
Oil Filters	2,535	1,775	2,229	3,544
Other Fuels (Reuse & Energy Recovery)	-	5	175	-
Other Organics[1]	47,430	145,251	149,510	126,096
Other Recyclable Plastics	12,524	13,009	18,194	18,367
Paint (Reused)	552	207	180	376
PET Plastics	16,767	15,803	16,986	18,830
Photographic Films	354	433	2,074	117
Post-Industrial & Flat Glass	1,750	2,390	1,230	3,661
Post-Industrial Plastics	223	-	-	-
Reuse (Clothing & Household)	22,001	6,164	15,050	5,455
Reuse (Construction & Demolition)	151	8,360	1,839	2,972
Reuse (Miscellaneous)	4,148	5,036	-	-
Roofing Material	10,872	14,518	15,470	13,021
Rubber Materials	8	10	-	-
Steel Cans	17,293	15,060	17,975	15,306
Textiles (Rags, Clothing, etc.)	16,445	24,976	25,580	41,688
Tires (Baled)	9,672	-	4,697	5,135
Tires (Burned for Energy)	10,725	18,121	10,450	10,443
Tires (Recycled)	35,439	26,775	25,678	25,756
Tires (Retread/Reuse)	6,164	10,834	7,813	7,059
Used Oil	110,038	71,725	76,612	74,114
Used Oil for Energy Recovery	177	2,568	2,409	3,432
Wood Waste	200,980	347,137	178,403	244,907
Wood Waste for Energy Recovery	613,888	847,115	626,325	431,260
Yard Debris	689,849	537,442	608,947	656,841
Yard Debris and Food (mixed)	-	285,965	209,364	261,221
Yard Debris for Energy Recovery	49,994	50,452	118,909	129,847
Total Diverted + Recycled Materials	**7,437,668**	**8,370,985**	**8,442,909**	**8,042,755**
Total Waste Disposed[1]	**6,126,660**	**7,043,048**	**6,315,653**	**6,655,937**
Total Waste Generated	**13,564,327**	**15,414,033**	**14,758,562**	**14,698,692**
Diversion Rate	**54.83%**	**54.31%**	**57.21%**	**54.72%**

Waste Diversion Benefits

Waste prevention and diversion from landfill disposal (or recycling) are important strategies to reduce greenhouse gas emissions and conserve energy. Products that enter the waste stream have energy impacts and associated greenhouse gas (GHG) emissions at each stage of their lifecycle: extraction, manufacturing, and disposal.

Decomposing waste in a landfill produces methane, a greenhouse gas more potent than carbon dioxide. Waste prevention and recycling reduce the amount of waste sent to landfills, lowering the greenhouse gases emitted during decomposition. Additionally, transporting waste to a landfill emits greenhouse gases through combustion of fossil fuels.

Fossil fuels are also used to extract and process raw materials necessary to replace those materials disposed with new products. Manufacturing products from recycled materials typically requires less energy than manufacturing from virgin materials. Waste prevention and recycling delay the need to extract some raw materials, lowering greenhouse gases emitted during extraction. Waste prevention means more efficient resource use, and making products from recycled materials requires less energy. Both result in lower greenhouse gas emissions during manufacturing.

As an additional benefit to climate change impacts, waste prevention and diversion can help store carbon. Carbon storage increases when fewer wood products are wasted and more are recycled. Carbon storage also increases when organic materials are composted and added to the soil.

Washington's measured diversion efforts for 2012 reduced greenhouse gas emissions by about 2.6 million tons (MTCE) or 765 pounds per person. The 8 million tons of material diverted from disposal in Washington in 2012 saved more than 128 trillion British thermal units of energy. This is similar to conserving one billion gallons of gasoline – enough to power 1.1 million homes for a year (nearly half the households in Washington). [17]

[17] Figures derived using EPA Waste Reduction Model (WARM), http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html; and U.S. Energy Information Administration, http://www.eia.gov/state/seds/seds-data-fuel.cfm?sid=US.

Waste Disposed in Washington State

Another way to look at waste disposed is to include all waste that goes to landfills or incinerators in the state. This includes waste brought from out-of-state, but does not include waste sent out-of-state for disposal. With all categories included, 6,111,417 tons of waste were disposed in all types of landfills and incinerators in Washington in 2012 (Table 4.9). For total solid waste disposed from 1993 – 2012, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.9
Total Amounts of Solid Waste Disposed in Washington

Disposal Method	2004	2005	2006	2007	2008	2009	2010	2011	2012
Municipal Solid Waste Landfills	5,506,112	5,517,342	5,398,008	5,354,005	5,157,547	4,775,888	4,875,010	4,925,583	4,565,487
Incinerated Waste	327,837	335,533	326,584	312,006	297,832	277,101	288,208	263,812	265,177
Wood waste Landfills[18]	*	*	*	*	*	*	*	*	*
Inert / Demolition Landfills	509,927	1,531,642	1,231,565	1,708,445	1,261,131	693,349	966,184	791,132	562,966
Limited Purpose Landfills	1,075,102	1,387,934	760,088	600,928	623,063	624,575	738,952	644,431	717,787
Total	**7,418,978**	**8,772,451**	**7,716,245**	**7,975,444**	**7,339,573**	**6,370,913**	**6,868,354**	**6,624,958**	**6,111,417**

Municipal Solid Waste Landfills

Amount of Waste Disposed of in Municipal Solid Waste Landfills

In 2012, 15 municipal solid waste landfills accepted waste totaling 4,565,487 tons.[19] Of the 15 landfills, 12 were publicly owned and 3 privately owned.

[18] The category of wood waste landfills is no longer included under *Chapter 173-350 WAC, Solid Waste Handling Standards.*

[19] Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities discussed, source of the waste and purpose of the discussion. For example, the recycling survey only accounts for "traditional" municipal waste in the disposed amount used to calculate the statewide recycling rate.

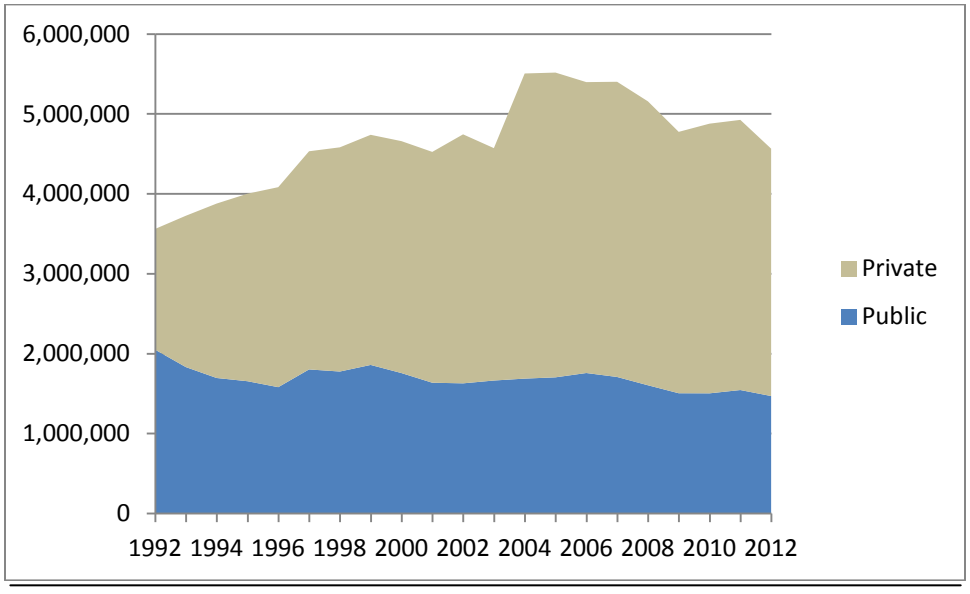
Table 4.10 shows the relationship of waste disposal to public/private ownership. As the table illustrates, 1,470,819 tons of solid waste disposed went to publicly owned facilities (32 percent), with the remaining 3,094,668 tons going to private facilities (68 percent).

Table 4.10
Waste Disposed in MSW Landfills – Public/Private

Ownership	Number of MSW Landfills		Amount of Waste Disposed (Tons)		% Total Waste Disposed	
	1991	2012	1991	2012	1991	2012
Public	36	12	2,696,885	1,470,819	69	31
Private	9	3	1,192,207	3,094,668	31	69
Total	**45**	**15**	**3,889,092**	**4,565,487**	**100**	**100**

The amount of waste disposed in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (Figure 4.7). The trend has continued since 1991, when the state first started tracking this type of information. The amount of waste disposed in the private facilities has increased from 31 percent since 1991 to 69 percent in 2012. The private Roosevelt Regional Landfill in Klickitat County and LRI 304th Street Landfill in Pierce County account for the majority of this increase.

Figure 4.7
Comparison of Waste Disposed in Public and Private MSW Landfills (Tons)



Types of Waste Disposed in Municipal Solid Waste Landfills

Traditionally, many people think of the waste going into MSW landfills as being mostly household waste.[20] Annual facility reports show a much wider variety of waste is disposed in MSW landfills. These wastes need to be considered in terms of remaining available capacity. All landfills reported disposing types of solid waste other than MSW. Demolition, industrial, inert, sludge, asbestos, tires, auto fluff, petroleum-contaminated soils (PCS), and other contaminated soils were the major waste streams.

Most landfills report in only a few categories. This makes knowing exact amounts of specific waste types difficult. For amounts and types of waste individual MSW landfills reported in 2012, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/. Table 4.11 shows changes in waste, types and amounts disposed in MSW landfills from 2003-2012. MSW landfill data from 1992 – 2012 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[20] "Household waste" as defined in *Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills*, means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and day-use recreation areas).

Table 4.11
Waste Types Reported Disposed in MSW Landfills (Tons)

Waste Types	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Municipal / Commercial[21]	3,394,428	3,598,760	3,631,873	3,787,080	3,847,352	3,637,010	3,435,505	3,383,984	3,261,582	3,282,962
Demolition Waste	324,069	366,087	541,945	551,572	532,409	363,343	260,500	254,453	307,815	320,939
Industrial Waste	212,918	1,034,615	624,958	182,661	131,167	130,929	115,390	164,755	102,842	99,569
Inert Waste	2,635	1,705	15,780	15,842	22,491	11,055	6,387	6,672	7,903	4,668
Commercial Waste[22]	93,036	-	-	-	-	-	-	-	-	-
Wood	47,622	25,576	9,896	4,462	71	18	424	206	574	676
Ash (other than SPI)	-	3,444	2,857	2,432	3,959	2,102	1,096	1,907	1,663	1,629
Sewage Sludge	23,435	10,172	12,476	21,303	6,703	7,892	15,732	2,455	2,033	2,544
Asbestos	9,625	12,086	7,943	5,633	5,379	4,308	4,975	4,996	6,574	7,570
Petroleum Contaminated Soils	342,172	279,982	320,283	455,964	326,019	693,719	515,567	476,368	426,085	283,212
Other Contaminated Soils	-	49,454	212,692	224,608	295,930	119,711	232,673	391,868	74,568	91,059
Tires	9,512	7,462	6,942	8,525	11,797	13,162	8,151	9,750	6,413	6,201
Special	-	-	-	-	-	-	-	-	-	-
Medical	2,459	2,565	2,576	2,721	2,805	2,932	2,907	12,109	8,726	10,484
Other [23]	110,364	114,204	127,121	135,206	167,933	171,366	176,581	168,720	718,805	453,972
Total	**4,572,275**	**5,506,112**	**5,577,342**	**5,398,008**	**5,354,005**	**5,157,547**	**4,775,887**	**4,878,241**	**4,925,583**	**4,565,487**

[21] Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.
[22] In 2004, the municipal and commercial categories were combined.
[23] Some of the "other" types of waste reported include auto fluff, special waste, vactor waste, street sweepings, and catchment basin and detention pond sediments.

Future Capacity at Municipal Solid Waste Landfills

As of December 2013, 15 MSW landfills were operating in Washington State. Ecology determined the amount of remaining capacity for them by asking them to report remaining permitted capacity, as well as the expected closure date. In April 2013, the facilities estimated about 278 million tons, or about 61 years of capacity at the current disposal rate, an increase from 2012.

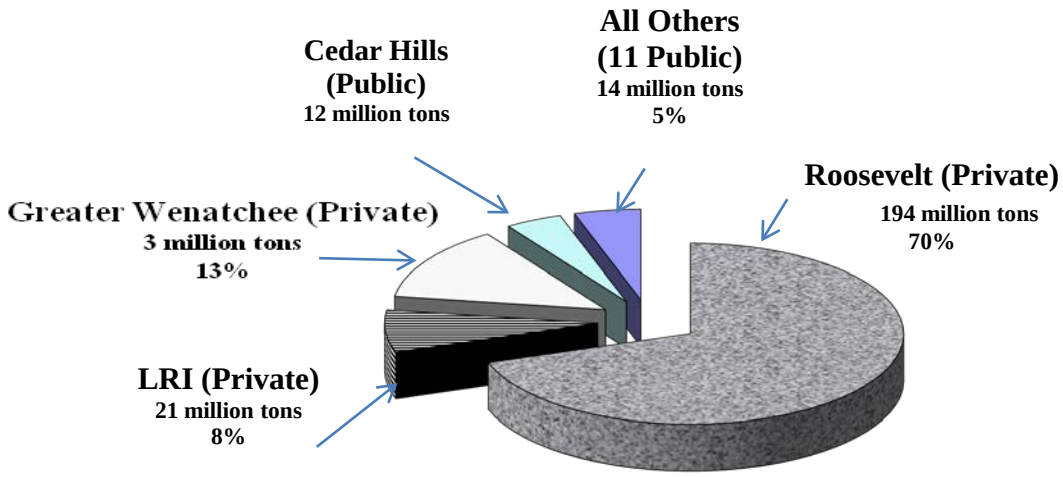
Changes in permit conditions, construction of new landfill cells, and changing volumes affect remaining capacity. Of the 15 currently operating landfills, 12 have more than 10 years of remaining permitted capacity.

Cowlitz County closed their municipal solid waste landfill in late 2013. The county has purchased the Headquarters Road Limited Purpose Landfill from Weyerhaeuser and is in the process of bringing the landfill in compliance with *Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfill Standards* and permitting it as a municipal solid waste landfill. This will increase the available capacity in the state.

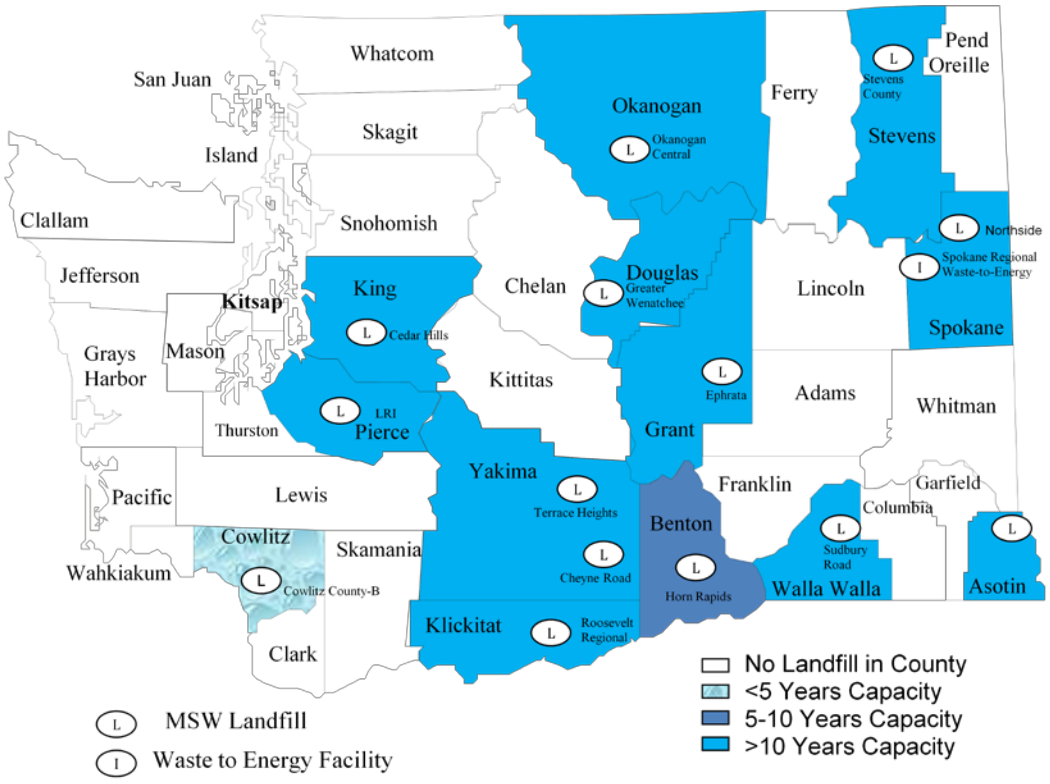
Capacity numbers in 2013 indicated more than 99 percent of remaining capacity was at landfills with more than 10 years before closure. Twelve of the 15 operating MSW landfills are publicly owned, with about 9 percent of the remaining capacity (26 million tons). About 91 percent of the remaining permitted capacity (252 million tons) is at the three privately owned facilities, compared to 73 percent in 1993.

The majority of the capacity, 70 percent of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Two other private landfills have the next largest remaining capacity: Greater Wenatchee (13 percent) and LRI in Pierce County (8 percent). Cedar Hills, a publically owned landfill in King County, has 4 percent of the remaining capacity. The other 11 publicly owned landfills have 5 percent of the remaining statewide capacity (see Figure 4.8). Map 4.A shows the locations and remaining years of capacity of MSW landfills.

Figure 4.8
2013 Remaining Permitted Capacity at MSW Landfills



Map 4.A
Location of MSW Landfills & Energy Recovery Facilities and Remaining Capacity (as of April 2013)



Besides the amount of remaining capacity, availability of that capacity needs to be considered. The Roosevelt Regional Landfill accepts waste from a wide variety of locations (see Map 4.B). In 2012, the facility received some type of solid waste from 26 counties in Washington, including the majority of the solid waste from 13 counties. They also received waste from Alaska, Oregon, Idaho, British Columbia, and a small amount from Guam.

For counties that do not have landfills, Roosevelt or the Oregon landfills have become their disposal option. Other landfills in the state accept the majority of waste from the county where they operate. To reserve capacity for local citizen needs, some are also using regional facilities for some of their non-municipal waste disposal needs.

Ecology bases its 61-year estimate of total remaining permitted capacity on the amount of waste disposed in MSW landfills in 2012. This amount will vary depending on waste reduction and recycling activities, population growth or decline, and the economy. Other contributing factors include the impact of waste imported into the state for disposal, or a shift to in-state disposal of waste currently exported. Cleanup activities, such as dredging contaminated sediments from Puget Sound, will add large volumes to the disposal totals.

Waste-to-Energy/Incineration

The Spokane Regional Waste-to-Energy Facility burned 265,177 tons of solid waste. It is the only incinerator in the state that burns municipal solid waste. For amounts and types of waste incinerated in 2012, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

MSW Landfill Disposal vs. Incineration

Table 4.12 compares the amount of solid waste disposed in MSW landfills, and waste-to-energy facilities and incinerators in 2012.

In 1991, 98 percent of waste was disposed in MSW landfills and 2 percent was incinerated. Twelve percent occurred in 1995, the highest percentage of incinerated waste in the state.

Table 4.12
Waste Disposed in MSW Landfills and Incinerators in 2012

Facility Type	Tons	Percent
MSW Landfills	4,565,487	95%
Incinerators	265,177	5%
Total	**4,830,664**	**100%**

In 2012, only about five percent of the waste stream was incinerated. The amount of waste incinerated will likely remain fairly stable, with only one operating MSW energy-recovery facility and no new facilities planned. See Map 4.A for the locations of MSW landfills and energy-recovery facilities in Washington.

Waste Disposed in Other Types of Landfills

Ash Monofill

Waste-to-energy facilities that generate more than 12 tons per day of MSW must dispose of their ash in a properly constructed ash monofill. *Chapter 173-350 WAC, Solid Waste Handling Standards*, and *Chapter 173-306 WAC, Special Incinerator Ash Management Standards* now regulate these facilities. In 2012, the Spokane Waste-to-Energy Recovery facility, the only facility of this type in the state, sent 73,959 tons of special incinerator ash to the ash monofill at the Roosevelt Regional Landfill in Klickitat County.

Inert Landfills and Limited Purpose Landfills

In addition to MSW landfills, two other types of landfills currently exist in the state: inert landfills and limited purpose landfills. These are regulated under *Chapter 173-350 WAC, Solid Waste Handling Standards*, which took effect in February 2003. The former wood waste landfill and inert/demolition landfill types no longer exist. Inert waste is now narrowly defined for disposal in an *inert* landfill. Demolition waste is no longer accepted at inert landfills. Landfills accepting demolition or wood waste need to be either limited purpose or MSW landfills. The limited purpose landfill permitted under the new rule has increased design and monitoring requirements.

The annual reporting forms for the inert landfills and limited purpose landfills under *Chapter 173-350 WAC* added more categories of waste. For detailed reports for the individual inert and limited purpose landfills, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

For a more consistent look at inert landfills over time, some waste categories were combined for Table 4.13. For inert/demolition landfill data from 1992 - 2003 and inert landfill data for 2004-2012, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.13
Waste Types and Amounts Disposed at Inert Landfills (in Tons)[24]

Waste Types	2004	2005	2006	2007	2008	2009	2010	2011	2012
Demolition	28,967	39,701	89,595	89,457	-	-	-	-	-
Industrial	-	-	-	2,150	1,940	799	945	1930	399
Inert	379,298	944,153	973,855	1,324,663	1,250,973	604,196	929,578	574,291	545,338
Wood	2,526	402	610	-	-	-	-	-	-
Asbestos	-	-	-	-	-	-	-	-	-
Ash (other than SPI)	-	7,989	7,497	7,052	7,680	6,320	5,311	5,029	6,038
PCS	66,260	215,286	91,399	277,812	-	-	-	-	-
Contaminated soils (other)	-	-	-	-	-	81,074	28,363	136,586	10,266
Tires	-	-	-	-	-	-	-	-	-
Other	33,472	324,110	68,609	7,311	538	960	1,951	1,296	915
Total Tons	**509,927**	**1,531,641**	**1,231,565**	**1,708,445**	**1,261,131**	**693,349**	**966,148**	**791,132**	**562,966**

[24] Chapter 173.350 WAC defines inert waste and limits the types of materials disposed in 'inert' landfills. These landfills were formerly permitted as inert/demolition landfills and accepted a wider variety of material. Some landfills reporting under this category are transitioning to a limited purpose permit or will be closing.

Table 4.14 shows waste types disposed in Limited Purpose Landfills. For Limited Purpose Landfill data from 1992-2012, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.14
Waste Types and Amounts Disposed at Limited Purpose Landfills (in Tons)

Waste Types	2004	2005	2006	2007	2008	2009	2010	2011	2012
Demolition	174,519	220,076	215,543	245,604	255,098	254,824	221,043	222,163	260,328
Industrial	262,560	420,285	257,297	173,992	149,978	113,636	157,960	124,392	133,513
Inert	36,155	53,597	39,928	48,784	100,115	27,335	43,322	25,259	21,092
Wood	32266	21,494	19,629	11,702	18,210	11,608	8,823	9,373	23,325
Ash (other than SPI)	533,201	409,376	138,616	77,082	65,117	121,329	180,620	155,923	122,178
Sludge	-	-	-	460	460	460	-	-	-
Asbestos	1,581	1,624	1,420	1,374	1,614	2,313	2,357	1,544	2,038
PCS	20,399	224,064	32,836	20,656	11,398	75,275	96,639	31,390	130,494
Soils (uncont.)	-	13,706	29,006	-	-	-	9,327	53,419	-
Tires	713	690	423	65	35	122	30	128	97
Other	13,708	23,022	25,390	21,210	21,038	17,673	18,830	20,840	24,721
Total Tons	**1,075,102**	**1,387,934**	**760,088**	**600,928**	**623,063**	**624,575**	**738,952**	**644,431**	**717,787**

The wood waste landfill category no longer exists under *Chapter 173-350 WAC, Solid Waste Handling Standards*. For wood waste landfill data from 1992 – 2003, see http://ecy.wa.gov/programs/swfa/solidwastedata/.

Movement of Solid Waste for Disposal

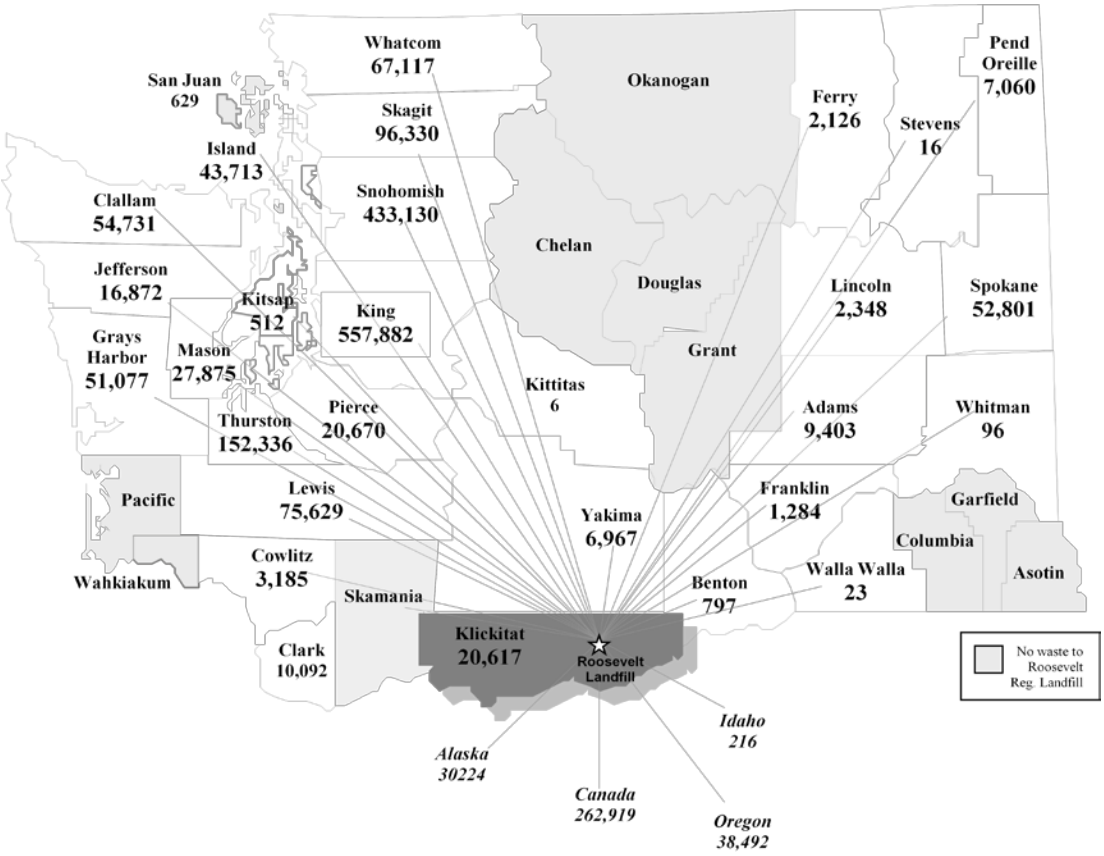
Movement of Waste Between Counties

All landfills and incinerators report the source, types, and amounts of waste they receive from outside their counties. Eight of the 15 active MSW landfills reported receiving solid waste from other counties in 2012.

Some MSW movement was because of closer proximity to a neighboring county's landfill. This was especially true for smaller landfills that received MSW from other counties without their own landfills. Some of the waste from other counties was non-municipal waste such as petroleum contaminated soils, demolition debris, and asbestos.

With closure of many local landfills, Roosevelt Regional Landfill in Klickitat County and Oregon's regional landfills have become the chosen disposal options. The Roosevelt Regional Landfill received some type of solid waste from 26 of the 39 Washington counties and also from out-of-state and out-of-country (Map 4.B).

Map 4.B
2012 Solid Waste to Roosevelt Regional Landfill (in Tons)



For many counties that still have operating MSW landfills, Roosevelt Regional Landfill or Columbia Ridge Landfill in Oregon have become options to dispose of some of their non-municipal waste, thus saving local landfill capacity for future need. Thirteen of the 26 counties rely on Roosevelt for the majority of their MSW disposal.

Twelve counties and the city of Seattle send the majority of their MSW to Oregon facilities (WASCO, Finley Buttes, and Columbia Ridge). Much of the waste that goes to the Columbia Ridge Landfill in Oregon is waste other than MSW.

You can find spreadsheets that identify the disposal location, type, and amount of waste for each county for 2012 (and previous years) at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Waste Imported from Outside the State

Landfills and incinerators also report the source, types, and amounts of waste received from out-of-state or out-of-country. In 2012, a total of 448,611 tons of solid waste, about 7 percent of the waste disposed and incinerated in Washington, was imported from outside the state's boundaries for disposal at MSW landfills and energy recovery facilities.

Table 4.15 shows types of waste received from out-of-state for disposal. The majority of this waste (362,403 tons) went to Roosevelt Regional Landfill. Of that, 262,919 tons came from British Columbia, with the remainder from Alaska (30,224 tons), Oregon (38,492 tons), Idaho (216 tons), and Guam (115)
.

Table 4.15
Out-of-State Waste Disposed in Washington

Type of Waste	2005	2006	2007	2008	2009	2010	2011	2012
Municipal Solid Waste	147,746	166,634	195,056	183,488	210,082	225,899	250,336	262,722
Demolition	2,962	3,212	4,964	3,848	5,846	14,322	68,552	65,742
Industrial	55,085	44,725	41,600	28,601	3,386	19,852	18,740	16,844
Inert	269	65	8	59	90,020	2,563	82,676	-
Woodwaste	-	-	30	5,413	11	-	-	-
Ash (other than SIA)	-	-	-	-	1,271	-	-	-
Sludge	19	10,883	-	-	-	470	1,615	2,065
Asbestos	831	283	354	262	175	532	840	-
Petroleum Contaminated Soils	4,801	3,650	4,954	3,804	3,605	12,554	3,521	72,849
Other Contaminated Soils	-	-	-	-	-	-	14,653	-
Tires	1,813	3,054	3,773	5,458	4,382	7,664	4,867	5,279
Medical	-	-	-	-	-	-	1,835	2,574
Other	1,332	1,585	1,982	1,055	744	3,234	976	2,842
Total	**214,858**	**234,091**	**252,720**	**231,988**	**319,522**	**287,646**	**448,611**	**432,380**

Nez Perce County in Idaho disposed of 31,000 tons of MSW in Washington's Asotin County Landfill. Asotin and Nez Perce counties prepared a joint local comprehensive solid waste management plan to meet the requirements of Washington State statute. They have an agreement for joint use of the landfill.

Graham Road Recycling and Disposal in Spokane County received 77,944 tons and the Weyerhaeuser limited purpose landfill in Cowlitz County received 3,171 tons from other states. For imported totals for 1991 – 2012 see http://www.ecy.wa.gov/programs/swfa.solidwastedata/.

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2011, a total of 1,574,099 tons of waste created in Washington were disposed of in Oregon landfills. Table 4.16 compares the waste amounts and types exported and imported. For exported totals for 1993 – 2012, see http://www.ecy.wa.gov/programs/swfa.solidwastedata/ .

Table 4.16
Comparison of Imported to Exported
Waste for all Solid Waste Facilities

Type of Waste	Imported		Exported	
	1991	2012	1993	2012
Municipal Solid Waste	24,475	262,722	710,515	1,111,219
Demolition	1,412	65,742	2,245	158,944
Industrial	-	16,844	864	54,224
Inert	208	-	-	226
Woodwaste	36	-	-	70
Ash (other than SIA)	-	-	-	1,593
Sludge	-	2,065	-	-
Asbestos	-	-	1,623	3,755
Petroleum Contaminated Soils	-	72,849	22,308	400,685
Other Contaminated Soils	-	-	-	32,560
Tires	-	5,279	-	293
Medical Waste	-	2,574	-	13,896
Other	-	2,842	18,512	87,240
Total	**26,131**	**432,380**	**756,067**	**1,964,705**

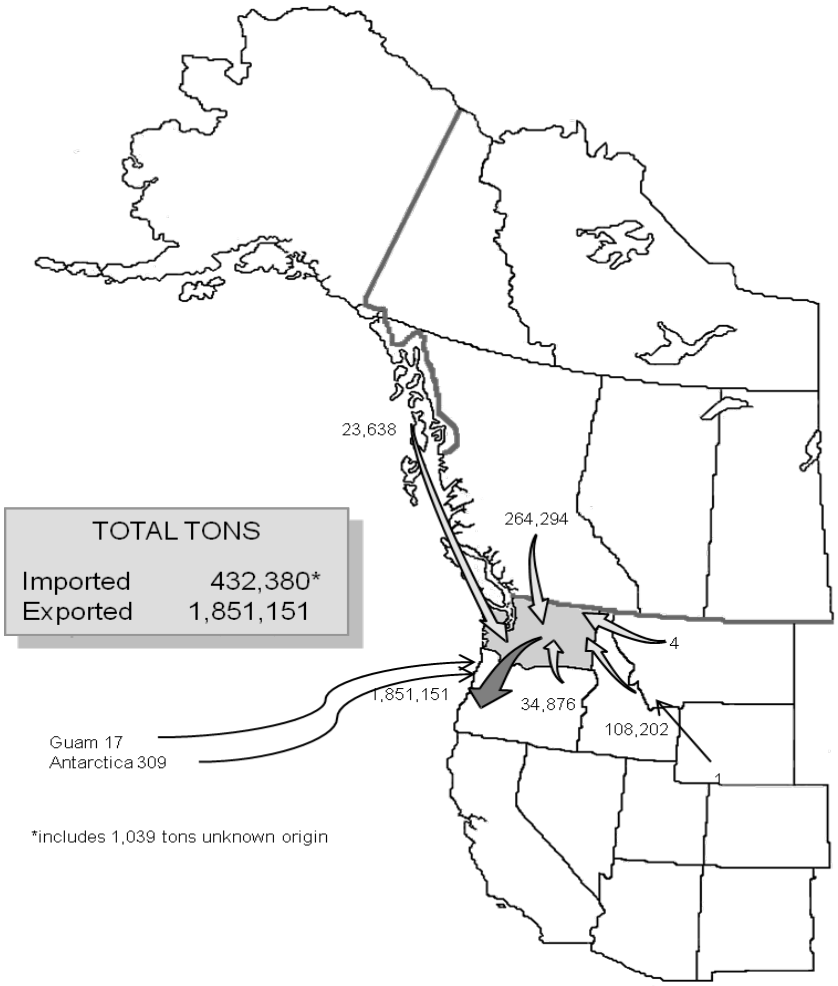
Major exporters of their MSW in Washington included the city of Seattle and Adams, Benton, Clark, Columbia, Franklin, Kitsap, Pacific, San Juan, Skamania, and Whitman counties, along with portions of Clallam, Snohomish, Walla Walla, and Whatcom counties. Reasons to export out-of-state have to do with closure of local landfills and negotiation of favorable long-haul contracts.

Trends in Interstate Waste Movement for Washington

The first significant movement of waste across Washington State boundaries started in 1991. In mid-1991, the city of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington, accepting waste from British Columbia, Idaho and California.

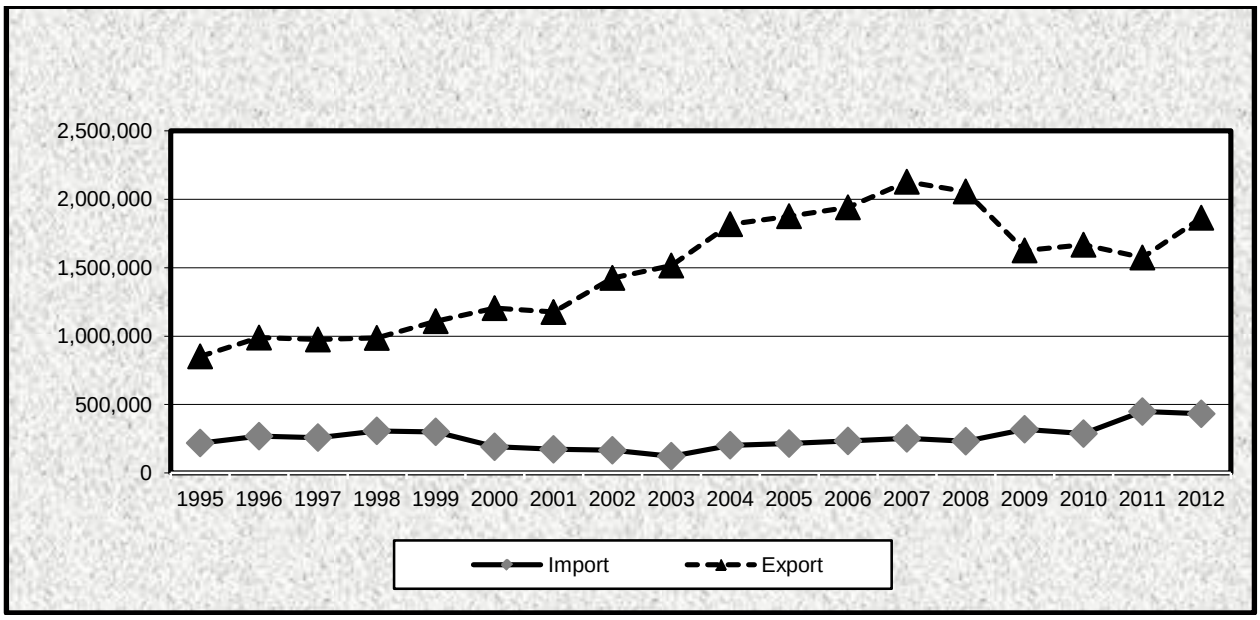
Map 4.C identifies the sources and amounts of waste that were imported and exported in 2012.

Map 4.C
Imported and Exported Waste (2012)

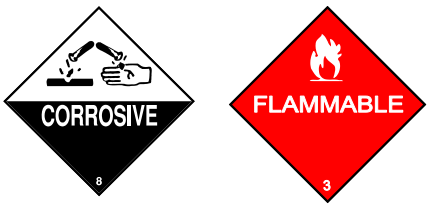


As shown in Figure 4.9, Washington exports have been much higher than imports since 1991. In 2012, about four times as much waste was exported to Oregon's landfills (Columbia Ridge, Wasco, and Finley Buttes) as what was imported to Washington for incineration or disposal.

Figure 4.9
Trend of Imported/Exported Solid Waste



Chapter 5: Moderate Risk Waste Management



The term "moderate risk waste" (MRW) was created by revisions to Washington State's 1986 Hazardous Waste Management Act (RCW 70.105). MRW is a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is waste created in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from state hazardous waste regulations.

- The total MRW collected in 2012 was about 23.1 million pounds.
- The average amount of HHW disposed of per participant was 65.8 pounds, and per capita was 1.76 pounds.
- More than 3 percent of Washington residents used a fixed facility or collection event to remove hazardous waste from their households, about 6.9 percent of all households.
- Counties that publicly collected the most CESQG waste per capita were Lewis, Yakima, Whatcom, Kitsap, and Jefferson.
- Counties that collected the most used oil per capita were Garfield, Stevens, Columbia, Asotin, Cowlitz, and Lincoln.
- Approximately 84 percent of all MRW collected was recycled, reused, or used for energy recovery.

MRW collections started in the early 1980s primarily as HHW-only events, also known as "roundups" or collection events. These events usually happened once or twice a year.

In the late 1980s, permanent collection facilities now known as fixed facilities began to replace collection events to fulfill the need for year-round collection. In addition, collection facilities have further developed with mobile units and satellite facilities. These efforts resulted in a larger number of customers served, decreased costs, and increased reuse and recycling of MRW.

Please note the data in this chapter is only a portion of the MRW waste stream. The MRW data presented here is reported through local governments, with a few private companies also reporting because they have a solid waste permit issued by the appropriate local authority. Chapter 4 includes additional statewide data.

Funding

RCW 70.105.235 authorizes Ecology to provide financial assistance through grants to locals for preparing, updating, and implementing local Hazardous Waste Plans, which detail local MRW programs. Ecology uses the Coordinated Prevention Grants program (CPG) to provide funding

to local governments for these purposes. CPG is funded by the Local Toxics Control Account (LTCA).[1] CPG funding requires a 25 percent match from local agencies.

All local governments in the state of Washington have completed Hazardous Waste (HW) Plans. See Chapter 2 for the status of plans in each county. Every local HW plan must address:

- ✓ HHW collection.
- ✓ Household and public education.
- ✓ Small business technical assistance.
- ✓ Small business collection assistance.
- ✓ Enforcement.
- ✓ Used oil collection and education.

Accuracy of Data Collection

Ecology created and circulates a standard reporting form to all MRW programs. However, the reported data can vary depending on a program's collection process, and how data is reported and interpreted. All programs must provide an individual MRW report. However, some programs do not meet this obligation, which can create gaps in the data.

2012 Data

Chapter 173-350 WAC, Solid Waste Handling Standards, requires local programs to submit MRW report forms annually. Annual reports are required to be submitted by April 1 for the previous calendar year collections. Information received from local programs through MRW annual reports provides Ecology with data on MRW infrastructure, collection trends, costs, waste types received at collection events and fixed facilities, and disposition of wastes collected. Ecology translates this data into the information contained in this chapter, and designs it to be specifically useful to those who operate or work in MRW programs in Washington State.

This year's report focuses on 2012 data with some comparisons to data published in previous years' reports. In an effort to provide useful information for individual programs, data is provided in categories by county size.

In 2012, Adams, Douglas, Mason, and San Juan Counties did not report any HHW or used oil collections. Private collectors provided the numbers shown in this report for these counties. Due to budget constraints, some counties have decided to reduce hours of operations at their fixed facilities, or have discontinued or reduced collection events.

[1] Authorized by RCW 82.21.030 (Chapter 82.21 RCW, Hazardous substance tax -- Model toxics control act).

Permanent fixed facilities now service most of the state. In 2012, Benton, Chelan, Douglas, Ferry, Garfield, San Juan, Skamania, and Wahkiakum counties did not have fixed facilities. Garfield residents can use the facility in Asotin County and Cowlitz County conducts a mobile event in Wahkiakum County. Benton, Chelan, Douglas, Ferry, San Juan, and Skamania counties conduct collection events.

In past reports, Ferry County was shown to have a fixed facility, but the facility is more properly categorized as a limited MRW Facility. Benton County had a permanent fixed facility until about mid-2010 when the facility was destroyed by a fire.

Collection services for CESQGs have leveled off statewide. In 2012, 17 fixed facilities serviced CESQGs, and 3 different counties provided collection events for CESQGs.

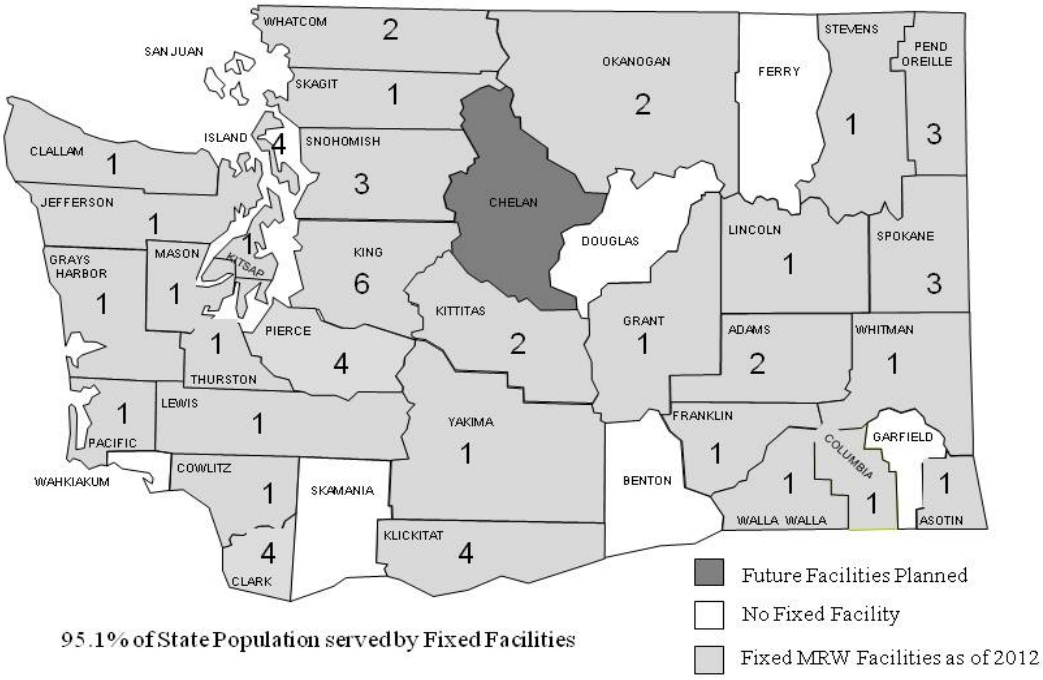
Table 5.1 shows the estimated population (based on data provided by the Office of Financial Management) by size of individual counties. In Washington State there are 42 programs that manage MRW. These programs include all 39 counties.

Table 5.1
Individual County Population by Size (2012)

< 50 K		**50 K – 100 K**		**> 100 K**	
Garfield	2,250	Walla Walla	59,100	Cowlitz	103,050
Wahkiakum	4,025	Mason	61,450	Skagit	117,950
Columbia	4,100	Clallam	72,000	Benton	180,000
Ferry	7,650	Grays Harbor	73,150	Whatcom	203,500
Lincoln	10,675	Chelan	73,200	Yakima	246,000
Skamania	11,275	Lewis	76,300	Kitsap	254,500
Pend Oreille	13,100	Island	79,350	Thurston	256,800
San Juan	15,925	Franklin	82,500	Clark	431,250
Adams	19,050	Grant	91,000	Spokane	475,600
Klickitat	20,600	**50 K – 100 K Total**	**668,050**	Snohomish	722,900
Pacific	20,970			Pierce	808,200
Asotin	21,700			King	1,957,000
Jefferson	30,175			**> 100K Total**	**5,756,750**
Douglas	38,900				
Okanogan	41,425				
Kittitas	41,500				
Stevens	43,700				
Whitman	45,950				
< 50K Total	**392,970**			**State Total**	**6,817,770**

Map 5.A shows which counties have permanent fixed facilities, the number of fixed facilities in each county, and which counties are likely to develop a permanent fixed facility in the future. Six of the fixed facilities represented on the map are owned and operated by private companies, either managing their own wastes from multiple facilities at one consolidation point or only servicing CESQG customers.

Map 5.A
58 MRW Facilities as of 2012



MRW Collected

As shown in Table 5.2, Washington programs collected approximately11.3 million pounds of HHW, 7.4 million pounds of used oil (UO) and 4.4 million pounds of CESQG waste, for a total of 23.1 million pounds of MRW during 2012.

Table 5.2
Total Pounds per Waste Category 2003-12

Collection Year	HHW lbs (no UO)	Used Oil lbs	CESQG lbs	Total MRW lbs
2003	16.0M	11.7M	1.3M	29.0M
2004	15.3M	12.4M	2.4M	30.1M
2005	14.7M	11.3M	6.3M	32.3M
2006	15.2M	10.0M	7.1M	32.3M
2007	14.9M	9.7M	7.6M	32.2M
2008	14,163,842	8,606,794	8,336,030	31,106,666
2009	12,257,316	8,916,633	4,867,334	26,041,283
2010	11,572,466	9,218,395	5,387,903	26,178,764
2011	10,965,429	7,857,614	4,977,625	23,800,668
2012	11,303,293	7,417,694	4,424,536	23,145,523

Collection by Waste Category and Type

As shown in Table 5.3, the waste types of MRW collected most in 2012 were non-contaminated used oil, antifreeze, paint related materials, latex paint, oil-based paint, and electronics. These totals include used oil and antifreeze collected at all collection sites. These six specific waste types accounted for approximately 68 percent of the estimated 23.1 million pounds of MRW collected in 2012.

Table 5.3
Six Most MRW Waste Types Collected in 2012

Waste Type	Total Lbs.
Non-Contaminated Used Oil	7,417,694
Antifreeze	2,537,926
Paint Related Materials	1,691,421
Latex Paint	1,508,477
Oil-based Paint	1,411,845
Electronics	1,194,708
Total	**15,762,071**

Table 5.4 provides summary information on total pounds of MRW collected from HHW and CESQG (publicly and privately collected) categories by waste types. Some waste type categories were changed and a few new ones added to the annual report form beginning in 2007.

Table 5.4
Total Pounds of MRW Collected by Waste Category in 2012

Waste Type	HHW	CESQG	Total
Acids	147,401	15,000	162,401
Acids (Aerosol Cans)	3	0	3
Aerosols (Consumer Commodities)	144,053	20,172	164,225
Antifreeze	626,168	1,911,758	2,537,926
Bases	219,998	17,764	237,762
Bases, Aerosols	205	6	211
Batteries (Auto Lead Acid)	723,712	6,035	729,747
Batteries (Small Lead Acid)	13,649	3,958	17,607
Batteries (Dry Cell)	335,375	25,076	360,451
Batteries (Nicad/NIMH/Lithium)	52,069	12,847	64,916
CFCs	2,384	57	2,441
Chlorinated Solvents	1,235	305	1,540
Compressed Gas Cylinders	282	375	657
CRT's	939,887	2,259	942,146
Cyanide Solutions	18	3	21
Dioxins	9	0	9
Electronics	1,173,439	21,269	1,194,708
Fire Extinguishers	13,779	959	14,738
Flammable Solids	6,258	21,482	27,740
Flammable Liquids	645,518	187,882	833,400
Flammable Liquids, Aerosols	871	0	871
Flammable Liquids Poison	131,789	8,339	140,128
Flammable Liquid Poison, Aerosols	50,796	595	51,391
Flammable Gas (Butane/Propane)	121,993	797	122,790
Flammable Gas Poison	1,798	0	1,798
Flammable Gas Poison, Aerosols	47,937	1,337	49,274
Latex Paint	1,440,105	68,372	1,508,477
Latex Paint, Contaminated	216,330	6,641	222,971
Mercury Compounds (Dental Amalgam)	42	11,062	11,104

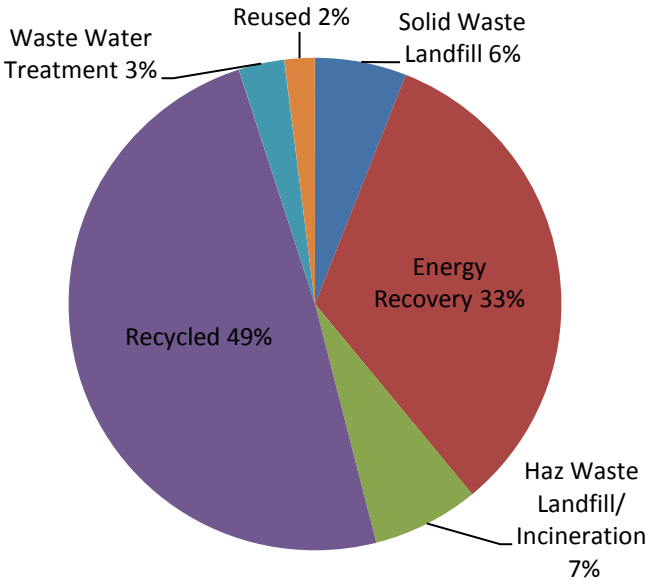
Waste Type	HHW	CESQG	Total
Mercury Containing Batteries (Button, etc)	34	15	49
Mercury Devices (Monometers, Barometers, etc.)	66	108	174
Mercury (Fluorescent Lamps & CFLs)	310,031	149,791	459,822
Mercury (Pure Elemental)	671	89	760
Mercury (Switches & Relays)	2	1	3
Mercury (Thermostats/Thermometers)	2,714	494	3,208
Nitrate Fertilizer	7,038	6	7,044
Non-PCB Containing Light Ballasts	7,227	2,650	9,877
Non-Regulated Liquids	86,797	83,080	169,877
Non-Regulated Solids	160,543	609,463	770,006
Oil-Based Paint	1,258,951	152,894	1,411,845
Oil-Based Paint, Contaminated	45,563	15,051	60,614
Oil Contaminated (oily H2O, oil w/PCB's, etc.)	21,634	116,813	138,447
Oil Filters	173,818	1,802	175,620
Oil Filters Crushed	3,213	0	3,213
Oil Non-Contaminated	7,256,142	161,552	7,417,694
Oil Stained Rags, Absorbent Pads, etc.	2,871	14,703	17,574
Organic Peroxides	882	190	1,072
Other Dangerous Waste	27,968	690,659	718,627
Oxidizers	32,189	2,536	34,725
Paint Related Materials	1,503,324	188,097	1,691,421
PCB Containing Light Ballasts	15,772	11,113	26,885
Pesticide/Poison Liquid	319,469	9,498	328,967
Pesticide/Poison Solid	211,379	15,284	226,663
Photo/Silver Fixer	765	14,002	14,767
Reactives	2,801	195	2,996
Tar and/or Adhesives	13,042	1,652	14,694
Used Cooking Oil	37,426	0	37,426
MRW TOTAL	**18,559,435**	**4,586,088**	**23,145,523**

* These totals do not match the HHW and CESQG totals in Table 5.2 because these contain used oil, which was separated out in Table 5.2. Also, in past reports most of the used oil was included with the CESQG totals. It is impossible to know if used oil collected at facilities such as Jiffy Lube is HHW or CESQG. However, it seems more reasonable that most of it is HHW rather than CESQG. Therefore, since 2008 it has been included with the HHW total in Table 5.4 instead of the CESQG total as in the past. Note: In 2012 MRW facilities recycled 307,012 pounds of materials such as propane tanks, cardboard, paint cans, etc. This number is not included in any of the data in the above table or elsewhere in this Chapter. It is noted here because it is a waste stream that MRW facilities must deal with. The majority of MRW facilities manage these recyclables appropriately.

Disposition of MRW Waste

The disposition of MRW collected is generally well managed. Most MRW is recycled or used for energy recovery. Very little of the MRW collected is safe for solid waste disposal. Seven percent of all MRW is disposed at a hazardous waste landfill or incinerator. Figure 5.1 shows final disposition of MRW between recycled, reused, energy recovery, hazardous waste landfill or incineration, solid waste landfill, and disposal through a wastewater treatment plant.

Figure 5.1
2012 MRW Final Disposition



MRW Data

Table 5.5 shows various data by county. HHW data is based on fixed facility and collection event information, but does not include HHW collected at limited MRW sites, such as used oil sites as participation numbers are not tracked at them. The last column of this table represents all MRW collected in that county, including privately collected CESGQ wastes, used oil, antifreeze, and oil filters collected at used oil sites. This information can be used to evaluate efficiencies within each county by comparing percentage of participants per housing units and costs, and HHW pounds per participant.

Housing units are the number of households in each county. This data is used instead of per capita because participants typically represent a household.

Table 5.5
Various HHW Data by County

County	Housing Units	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil From Limited Sites Total lbs
Adams*	6,327	0	0%	$0	0.00	0	2,376
Asotin	9,922	2,000	20.2%	$57.56	108.96	217,910	219,379
Benton^^	70,764	0	0%	$0	0.00	0	13,855
Chelan	35,743	716	2%	$92.63	105.87	75,801	151,341
Clallam	35,971	604	1.7%	$141.95	75.82	45,793	188,051
Clark	169,665	15,847	9.3%	$43.46	163.14	2,585,241	4,156,377
Columbia^	2,150	0	0%	$0	0.00	15,090	17,607
Cowlitz	43,691	1,959	4.5%	$61.38	407.39	798,084	1,093,003
Douglas*	16,216	0	0%	$0	0.00	0	6,595
Ferry	4,441	14	.3%	$135.71	25.50	357	3,986
Franklin	25,585	334	1.3%	$23.88	8.49	2,834	12,022
Garfield	1,231	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	18,232
Grant	35,736	358	1%	$142.76	127.85	45,772	57,046
Grays Harbor	35,399	1,637	4.6%	$189.73	60.33	98,760	247,759
Island	40,572	1,991	4.9%	$146.80	244.09	485,975	508,693
Jefferson	17,966	974	5.4%	$69.59	36.74	35,786	98,782
King	861,965	69,713	8.1%	$51.15	48.25	3,363,842	6,509,377
Kitsap	107,858	7,768	7.2%	$98.16	89.85	697,942	1,162,962
Kittitas	22,256	337	1.5%	$209.26	177.03	59,660	169,161
Klickitat	9,977	8,425	84.4%	$3.07	12.71	107,062	139,557
Lewis	34,439	1,058	3.1%	$118.21	279.86	296,096	390,148
Lincoln	5,838	300	5.1%	$27.11	133.49	40,046	69,539
Mason*	32,810	0	0%	$0	0.00	0	2,745
Okanogan	22,395	430	1.9%	$143.27	42.86	18,430	61,135
Pacific	15,604	201	1.3%	$122.41	69.53	13,975	47,348
Pend Oreille	7,992	3,287	41.1%	$16.94	11.63	38,244	38,739
Pierce	329,158	9,971	3%	$63.81	59.15	589,738	1,031,285
San Juan*	13,483	0	0%	$0	0.00	0	0
Skagit	51,895	4,290	8.3%	$30.18	22.50	96,529	298,090
Skamania	5,720	207	3.6%	$98.35	128.21	26,539	49,734
Snohomish	290,592	9,544	3.3%	$68.46	64.15	612,264	2,187,850
Spokane	203,882	5,120	2.5%	$60.62	131.96	675,620	1,748,242
Stevens	21,301	183	.9%	$130.93	302.21	55,304	249,776
Thurston	110,368	13,347	12.1%	$27.80	20.55	274,255	594,276

County	Housing Units	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil From Limited Sites Total lbs
Wahkiakum	2,092	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	11,160
Walla Walla	23,850	1,791	7.5%	$89.71	60.85	108,979	111,176
Whatcom	91,682	7,059	7.7%	$47.14	43.11	304,366	482,080
Whitman	19,462	789	4.1%	$68.23	35.14	27,724	45,603
Yakima	86,345	12,238	14.2%	$22.83	16.26	198,993	950,436
STATEWIDE	**2,922,343**	**182,492**	**6.2%**	**$52.02**	**65.83**	**12,013,011**	**23,145,523**

* These counties did not report in 2012 and total pounds shown represents the amount private companies collected from CESQG's in those jurisdictions.
^^ These counties scaled back operations in 2011 and HHW pounds reported represent those collected at limited MRW sites and CESQG amounts reported are from private companies.
^ These counties did not report participation or cost information numbers in 2012

Household Hazardous Waste (HHW)

Participants per Housing Unit

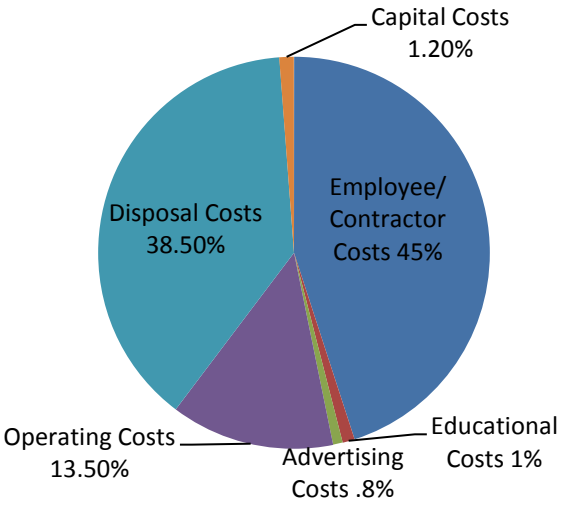
Counties that exhibit ten percent or higher of participants per housing unit provide excellent public education to encourage use of facilities or events, have very convenient locations for their collection facilities, or both.

Cost per Participant and Overall HHW Cost Breakdown

This statistic is hard to compare, because of the many variables in program costs. Some programs record every cost, whether direct or indirect. Others record only the disposal and basic operation costs.

Larger counties have the advantage of efficiency in scale, both in quantities received and in disposition options. Also, there are differences in service levels of the basic program, accounting differences, and errors. However, this data does provide an idea of what is possible and an incentive to contact those counties that seem to operate efficiently. According to annual reports submitted to Ecology, HHW programs spent just under $9.5 million in 2012 statewide (does not include CESQG costs). Figure 5.2 shows the overall breakdown of HHW costs reported to Ecology.

Figure 5.2
2012 HHW Cost Breakdown



HHW Pounds per Participant and per Capita

The average pounds collected statewide per participant for HHW was 65.83. Table 5.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2010-2012. Statewide, HHW pounds per capita collected was 1.76 pounds.

Table 5.6
High Collections of HHW (No Used Oil Sites)
Pounds per Capita by County in 2010-12

HHW 2010		
County	**Size**	**Lbs**
Thurston	>100K	7.68
Cowlitz	>100K	6.65
Clark	>100K	5.15
Lincoln	<50KK	4.67
Klickitat	<50K	4.25

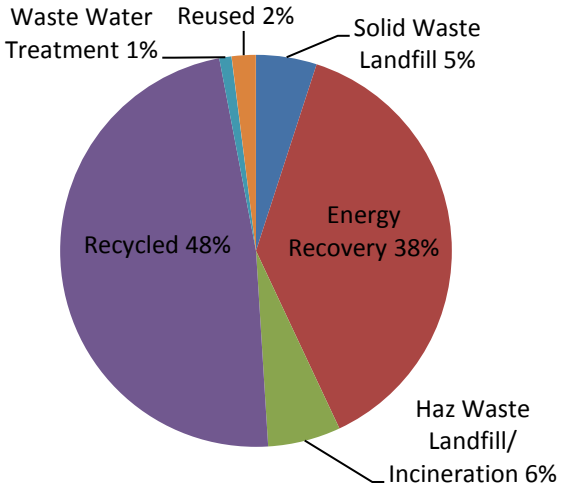
HHW 2011		
County	**Size**	**Lbs**
Pend Oreille	<50K	7.30
Asotin	<50K	6.65
Island	50-100K	6.32
Lincoln	<50K	4.84
Clark	>100K	4.80

HHW 2012		
County	**Size**	**Lbs**
Cowlitz	>100K	7.75
Asotin	<50K	6.98
Island	50-100K	6.12
Clark	>100K	6.00
Klickitat	<50K	5.20

HHW Disposition

Figure 5.3 shows the final disposition of all HHW collected throughout Washington State in 2012.

Figure 5.3
2012 HHW Final Disposition



Conditionally Exempt Small Quantity Generator (CESQG)

Nineteen local MRW programs collected CESQG wastes in 2012. The City of Tacoma* (Pierce County) offers CESQG's collection assistance for fluorescent lights only. San Juan County sponsored a CESQG collection event in the past and may have in 2012, but San Juan County did not provide an annual reports for 2012. Counties that sponsored CESQG waste collections are:

Asotin	Jefferson	Pacific	Yakima
Chelan	King	Pierce*	
Cowlitz	Kitsap	Skagit	
Grant	Kittitas	Snohomish	
Grays Harbor	Lewis	Thurston	
Island	Okanogan	Whatcom	

The top five counties that publicly collected the most CESQG waste per capita in 2012 were:

- Lewis
- Yakima
- Whatcom
- Kitsap
- Jefferson

Table 5.7 shows the total amount of CESQG waste collected publicly and privately in each county. When we take into account both public and private collection numbers, the top five counties for CESQG collections per capita in 2012 were:

- Clark
- Spokane
- King
- Lewis
- Columbia

Table 5.7
2012 Washington State Public and Private CESQG Collections in Pounds by County

County	Publicly Collected CESGQ Waste	Public CESQG Waste Collected/Capita	Privately Collected CESGQ Waste	Total CESQG Waste Collected	Total CESQG Waste Collected/Capita
Adams	0	0	2,376	2,376	.13
Asotin	472	.02	997	1,469	.07
Benton	0	0	1,799	1,799	.01
Chelan	9,808	.13	11,922	21,730	.30
Clallam	0	0	2,519	2,519	.04
Clark	0	0	1,499,983	1,499,983	3.50
Columbia	0	0	2,517	2,517	.61
Cowlitz	11,152	.11	7,767	18,919	.18
Douglas	0	0	6,595	6,595	.17
Ferry	0	0	0	0	0
Franklin	0	0	9,188	9,188	.11
Garfield	0	0	232	232	.10
Grant	730	.01	10,544	11,274	.12
Grays Harbor	19,028	.26	4,504	23,532	.32
Island	20,543	.26	2,175	22,718	.28
Jefferson	9,625	.32	953	10,578	.35
King	91,361	.05	1,402,722	1,494,083	.76
Kitsap	87,216	.34	16,113	103,329	.41
Kittitas	2,934	.07	2,257	5,191	.13
Klickitat	0	0	675	675	.03
Lewis	39,283	.52	8,149	47,432	.62
Lincoln	0	0	3,262	3,262	.31
Mason	0	0	2,745	2,745	.05
Okanogan	8,224	.20	3,608	11,832	.29
Pacific	2,478	.12	555	3,033	.15
Pend Oreille	0	0	495	495	.04
Pierce*	3,491	.01	173,824	177,315	.22
San Juan	0	0	0	0	0
Skagit	15,555	.13	18,581	34,136	.30
Skamania	0	0	1,395	1,395	.12
Snohomish	94,417	.13	81,884	176,301	.24
Spokane	0	0	592,182	592,182	1.25
Stevens	0	0	3,090	3,090	.07
Thurston	30,155	.12	12,843	42,998	.17
Wahkiakum	0	0	0	0	0
Walla Walla	0	0	2,197	2,197	.04
Whatcom	92,365	.45	27,785	120,150	.60
Whitman	0	0	7,385	7,385	.16
Yakima	109,787	.45	11,646	121,433	.49
Statewide Totals	**648,624**	**.10**	**3,937,464**	**4,586,088**	**.67**

* City of Tacoma's CESQG program collects fluorescent lighting only.

Table 5.8 shows the total amount of CESQG waste collected publicly and privately by waste type. Excluding the "Other DW" category, the top five CESQG waste types collected in 2012 were:

- Antifreeze
- Non-Regulated Solids
- Paint Related Materials
- Flammable Liquids
- Mercury Collections

Table 5.8
Washington State Public and Private CESQG Collections for 2012 in Pounds by Waste Type

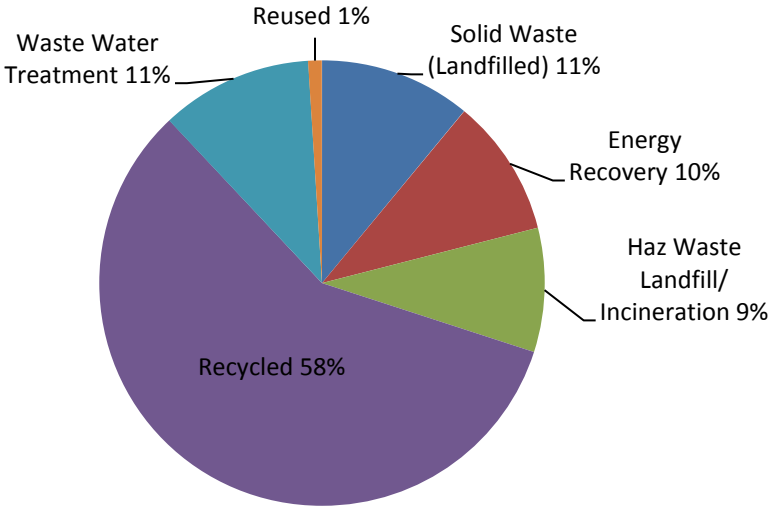
Waste Type	Public Collections	Private Collections	Totals
Antifreeze	13,458	1,898,300	1,911,758
Other DW	7,765	682,894	690,659
Non-Regulated Solids	5,823	603,640	609,463
Paint Related Materials	18,952	169,145	188,097
Flammable Liquids	100,414	87,468	187,882
Mercury Collections	100,910	60,650	161,560
Used Oil - Non-Contaminated	28,817	132,735	161,552
Paint - Oil Base	123,402	29,492	152,894
Used Oil-Cont. (oily water, etc)	8,430	108,383	116,813
Non-Regulated Liquids	29,257	53,823	83,080
Paint – Latex	58,684	9,688	68,372
Batteries - Alkaline/Carbon	15,007	10,069	25,076
Flammable Solids	2,331	19,151	21,482
Electronics	0	21,269	21,269
Aerosols - Consumer Commodities	3,314	16,858	20,172
Bases	16,704	1,060	17,764
Pesticides - Poison/Solids	15,284	0	15,284
Paint - Oil Base –Contaminated	14,861	190	15,051
Acids	13,931	1,069	15,000
Oil Stained Rags, Absorbent Pads, etc.	5,634	9,069	14,703
Photo/Silver Fixer	5,984	8,018	14,002
Batteries-Nicad/Lithium	6,075	6,772	12,847
PCB Containing Light Ballasts	10,829	284	11,113
Pesticides - Poison/Liquid	8,407	1,091	9,498
Flammable Liquid Poison	8,339	0	8,339
Paint - Latex Contaminated	6,641	0	6,641
Batteries – Auto Lead Acid	4,137	1,898	6,035
Batteries - Small Lead Acid	2,486	1,472	3,958
Non-PCB Containing Light Ballasts	2,440	210	2,650
Oxidizers	2,430	106	2,536
CRT's	0	2,259	2,259
Oil Filters	1,802	0	1,802
Tar/Adhesives	1,652	0	1,652
Flammable Gas Poison – Aerosols	1,337	0	1,337
Fire Extinguishers	959	0	959
Flammable Butane/Propane	777	20	797
Flammable Liquid Poison – Aerosols	595	0	595
Compressed Gas Cylinders	325	50	375
Chlorinated Solvents	180	125	305
Reactives	188	7	195
Organic Peroxides	41	149	190
CFC's	7	50	57
Nitrate Fertilizer	6	0	6
Bases - Aerosols	6	0	6
Cyanide Solutions	3	0	3
Totals	**648,624**	**3,937,464**	**4,586,088**

CESQG Disposition

Sixty-eight percent of all CESQG waste collected in 2012 was either recycled or used for energy recovery. See Figure 5.4 for the complete disposition of CESQG wastes in 2012. There are several differences between final disposition of HHW and CESQG wastes worth noting:

- 38 percent of HHW was sent for energy recovery versus 10 percent of CESQG wastes.
- More CESQG waste is disposed via the waste water treatment process (11%) compared to only 1% of HHW.

Figure 5.4
2012 CESQG Final Disposition



Collection/Mobile Events

Table 5.9 represents the number of mobile and collection events held statewide from 2010-12. The number of events increased over the previous 2 years.

The amount of waste collected through these types of events was approximately 1.8 million pounds in 2012, which is approximately 8 percent of all MRW collected in 2012. The Waste Mobile in King County conducted 73 mobile events, including a weekly event at the Auburn Supermall that collected a little more than 1 million pounds of MRW in 2012.

Table 5.9
2010-12 Collection/Mobile Event Collection Amounts

Type of Event	Number of Events			Pounds Collected		
	2010	2011	2012	2010	2011	2012
Mobile	79	73	80	1,606,286	1,130,122	1,217,135
Collection	46	47	69	439,572	876,410	637,664
Totals:	**125**	**120**	**149**	**2,045,858**	**2,006,532**	**1,854,799**

Used Oil Sites

In 2012, facilities and collection sites reported collecting a total of 7,417,694 pounds of used oil. Used oil collection peaked statewide (12.4 million pounds) in 2004 and has mostly steadily declined over the years. Used oil collections need to be continually monitored. There are more cars on the road than ever, so one would expect this category to keep increasing. The recent trend to change oil every 5,000 miles compared to 3,000 miles and less do-it-yourself oil changers may be impacting this category. Table 5.10 shows the six counties with the highest collections in pounds per capita by county size for 2010-12.

Table 5.10
Used Oil High Collection Counties - Pounds per Capita by County Size
Collected at Facilities and Used Oil Collection Sites 2010-12

Used Oil Sites - 2010			Used Oil Sites - 2011			Used Oil Sites – 2012		
County	Size	Lbs	County	Size	Lbs	County	Size	Lbs
Garfield	<50K	7.8	Garfield	<50K	8.0	Garfield	<50K	8.0
Skamania	<50K	4.1	Stevens	<50K	4.2	Stevens	<50K	4.3
Stevens	<50K	4.0	Skamania	<50K	4.0	Columbia	<50K	3.2
Lincoln	<50K	3.8	Columbia	<50K	3.4	Asotin	<50K	3.1
Wahkiakum	<50K	3.5	Lincoln	<50K	3.3	Cowlitz	50-100K	2.5
Cowlitz	50-100K	2.9	Wahkiakum	<50K	3.1	Lincoln	<50K	2.4

Statewide Level of Service

The Washington State Office of Financial Management reported that as of 2012, Washington State had an estimated 2,922,343 housing units[2]. MRW Annual Reports revealed there were 182,492 participants who used the services of either an MRW collection event or MRW fixed

[2]This information was downloaded from http://ww.ofm.wa.gov/

facility. The actual number of households served is larger, because most used oil sites do not record or report numbers of participants. The actual number of households served is also larger, because some participants counted at events or by facilities bring HHW from multiple households.

One way to estimate the approximate number of households served is to add ten percent to the participant values. This method gives an estimate of 200,741 participants served in 2012. This number represents 6.9 percent of all households in Washington State. Table 5.11 shows the percent of participants served statewide since 2001.

Table 5.11
Percent of Participants Served Statewide

Year	Percent Participants Served	Year	Percent Participants Served
2001	6.1	2007	9.1
2002	6.8	2008	8.7
2003	8.9	2009	8.3
2004	8.9	2010	7.9
2005	9.0	2011	7.8
2006	8.6	2012	6.9

Trends in Collection

The majority of counties in Washington State have at least one fixed facility. Collection events can be a useful strategy to supplement collection services for residents inconveniently located from fixed facilities.

Overall, MRW collections leveled off between 2005 and 2007. 2008-12 saw a significant reduction in the amount of MRW collected, with the biggest drops in 2009 and 2011. This is likely due to local policies of no longer collecting latex paint, a decrease in CESQG antifreeze collections by private companies, and the overall state of the economy.

Product Stewardship

Some other methods of managing MRW are gaining wider acceptance in Washington State and across the country. Product stewardship efforts have resulted in the statewide electronics recycling program. In 2010, the Washington State Legislature passed a product stewardship bill for mercury-containing lighting products. Paint and rechargeable batteries legislation was introduced in the 2012 Legislative Session, brought back again in the 2013 Legislative Session, and paint is scheduled to be introduced again in 2014.

It remains to be seen what role MRW facilities will play in the future as product stewardship becomes more widespread. Will MRW facilities continue to collect products, but be reimbursed by industry for management of their products, or will MRW facilities choose to let industry find alternative locations and personnel to manage their programs?