Solid Waste in Washington State

20th Annual Status Report

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State of Washington

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Solid Waste in Washington State

Twentieth Annual Status Report

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Chapter 1: Issues Facing Washington State

Budget

Impacts to Ecology's Waste 2 Resources Program from the Waste Reduction, Recycling and Litter Control Account Reductions and Proviso Language for Fiscal Year 2012-13

Ecology's funding from the Waste Reduction, Recycling, and Litter Control Account (WRRLCA) was reduced by $7 million. Proviso language placed limitations on how the Waste 2 Resources Program (W2R) can spend the remaining funds:

> *"(5) The department may not spend waste reduction, recycling, and litter control account funds to support the following activities: The beyond waste plan, work on national solid waste recycling issues, work on construction and demolition recycling and green building alternatives, education programs including the green schools initiative, and management of the 1-800-recycle hotline and database on school awards. Waste reduction, recycling, and litter account control funds must be prioritized to support litter pickup using correctional crews, regulatory programs, and technical assistance to local governments."*

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 in WRRLCA.

Following are descriptions of some of the suspended and delayed work:

Impacts to Litter Pickup and Prevention

- Ecology Youth Corps reductions resulting in 300,000 pounds less litter pickup and 80 fewer youths hired.
- State agency and Community Litter Cleanup Program (CLCP) reductions resulting in dirtier parks, public lands, county roads and more illegal dumps.
- No State Patrol secured load emphasis patrols resulting in increased injuries and accidents.
- No prevention campaign. According to surveys, the campaign reduced litter by 25 percent.

- No 1-866-Litter1 Reporting Line, which is a lost educational opportunity. Ninety-two percent of people who received a litter letter said they would not litter again.

Construction and Demolition Recycling and Green Building Alternatives Reductions

- Construction and demolition debris makes up a third of our waste stream that is landfilled, leading to increased greenhouse gases.

- Reduced staffing to work with construction and demolition recycling facilities.

- Fewer trained building staff and ultimately fewer green buildings.

- Additional costs for state agencies that need assistance with meeting RCW 39.95D.

Reduced Activities Promoting Beyond Waste Organics Work Related to Food Waste and Composting

- Organic waste represents the single largest component in our waste stream. Once in the landfill, organic waste decomposes anaerobically in uncapped cells, releasing methane gas.

- Reduced management strategies related to food waste, which is a major contributor to greenhouse gas emissions in the state.

- We are experiencing significant waste management problems at compost facilities in Western Washington. Reducing funding for composting required us to reduce staffing by 0.5 for composting. This will lead to further delays in the compost rules, and reduced ability to respond to citizen complaints and concerns.

Unfunded Regional Facility Specialist Positions

- Reduced staffing for biosolids permitting and compliance issues.

- Reduced staffing for compliance issues such as odor at compost facilities.

Suspended Enforcement and Oversight Related to Recyclable Materials -Transporter and Facility Requirements *(Chapter 173-345 WAC*)

- This reduction resulted in:

    - No record checks at registered transporters of recyclables.

    - Limited ability to keep registration list current on the website.

- No random checking loads of recyclables to see if they end up at recycling facilities (or landfills).

Unfunded Vacant Electronics Recycling

- Reduced staff to track down orphan brand owners illegally selling products in the state.
- Reduced staff to ensure E-Cycle facilities are in compliance with requirements.
- Less staff to perform enforcement actions.

Reduced Contract and Staffing Funds for the Waste to Fuels Technology Program

- Current technology is not sufficient to manage the volume and types of landfilled organic materials. New technologies are essential to turning organic wastes into resources, such as soil amendments, and stable carbon, electricity and transportation fuels.
- An overburdened compost industry is creating odor problems and excess product supply. There will be delays in the program research and development of other technologies that are better equipped to manage the broader range of organic waste types collected. These technologies also mitigate climate change.
- Only $250,000 was available for funding this biennium. Washington State University estimates the $400,000 Ecology provided in the 2009-11 Biennium allowed them to obtain matches of $13 million in federal and private grant dollars.
- The growth of the anaerobic digestion industry in Washington is a direct result of the basic research and development work performed early under the program.
- No staff resources to obtain grants to expand the scope of organics management technologies in Washington.

Reduced Staff and Contract Funds to Provide Data and Information Sharing with Local Governments

- No funding for a Waste Characterization Study.
    - The study plays an important part in waste prevention and management in Washington State.
    - Information gained in waste characterization studies allows regulators to set safe, effective standards for treatment and disposal of wastes.

  - Waste characterization studies are critical when planning and implementing programs intended to reduce the volume and toxicity of wastes, and recycle, properly dispose of, and treat waste.

  - Most local governments do not have the funding to do their own studies. They depend on the waste characterization studies to provide data they need for planning purposes, developing local programs, communicating with commissioners on issues, and evaluating the effectiveness of recycling, diversion or waste reduction programs.

- Reduced staff and computer support for the Solid Waste Information Clearinghouse used by local governments to share information about programs and report on their Coordinated Prevention Grants outcomes and results.

- Suspension of the Closed-Loop Scoop, an online newsletter for local governments and other stakeholders that shares information about their innovative programs around the state.

- Delay of improvement to the Solid Waste Database for on-line reporting by solid waste facilities, which would reduce paperwork and improve efficiency of required reporting.

1-800-RECYCLE Hotline

- Because of reduced staffing over the last 2 biennia, the hotline has become an inefficient operation. It is not being maintained or staffed as it needs to be.

- The W2R Program is looking for a purchaser to provide funds to Ecology for rights to the hotline name and number.

Future Regulatory Changes in Washington

Children's Safe Product Act

The state's Children's Safe Product Act (CSPA - *Chapter 70.240 RCW, Children's Safe Products*) was signed into law in 2008. Since then, Ecology worked with our partners -- product manufacturers, nonprofits, consumers, environmental and health organizations, and other state agencies -- to develop the needed guidance to carry out this groundbreaking law.

Ecology completed rulemaking in 2011 on the rule to implement the CSPA and adopted *Chapter 173-334 WAC, the Children's Safe Products Reporting Rule*. The final rule is the culmination of a process to develop the rule dating back to 2009. After hearing from a Governor-appointed advisory group, Ecology launched a pilot rule process in January 2010, working with children's product-makers and others to learn how best to structure the chemical reporting process under the law.

Supplemental Public Comment Period

Ecology solicited a second round of public comment on the CSPA reporting rule before adoption. Ecology made a number of changes in response to comments received during the first public comment period, which closed in January 2011. The supplemental public comment period ran from May 4 through June 15, 2011.

A number of definitions were added to clarify concepts requested by commenters. Reporting triggers were adjusted and a distinction was made for the purposes of reporting between intentionally added chemicals and chemical contaminants. Ecology also clarified how it will approach enforcement of the reporting requirement.

Final Chemical Reporting List

The final list of chemicals for reporting, which was developed in consultation with the Department of Health, contains 66 chemicals or classes of chemicals that manufacturers must report on. The list can be found in the rule, as well as on Ecology's CSPA website (Children's Safe Product Act web page). The list of chemicals is dynamic. Ecology may change the rule to update the list in the future as new information becomes available.

As required by the law, all of the chemicals on the list are toxic and have either been found in children's products or have been documented to be present in human tissue (blood, breast milk, etc.). However, just because a chemical is present in a product does not mean that children are exposed to it or harmed by it. Children's products are just one way that children might be exposed to a harmful chemical.

Understanding How Chemicals are Used

Manufacturers of children's products must report to Ecology if their products contain any of the chemicals on the reporting list. The CSPA rule applies to companies that make children's products like toys, cosmetics, jewelry, baby products and car seats. The largest manufacturers that make products likely to be placed in a child's mouth or on their skin, or mouthable products for children age three and under must report first. Other manufacturers would report according to the phased-in schedule in the rule. The first reports under the law will arrive in August 2012.

Retailers who only sell – but do not make or import – children's products are not subject to the rule.

Rather than looking at just one chemical at a time in an individual product, Ecology will collect information that will help us understand how chemicals are being used in a wide range of product categories. Reporting on the use of toxic chemicals is the first step toward getting safer products for children. Reports under this law will help policy makers decide if further actions are needed.

For more information, see the Children's Safe Product Act web page.

Solid Waste Handling Standards Rule Update

In May 2009, the W2R Program began the process to update *Chapter 173-350 WAC, Solid Waste Handling Standards*. This rule sets minimum functional performance standards for the proper handling and disposal of solid waste originating from residences, commercial, agricultural and industrial operations and other sources. The rule has not been updated since 2005 and some requirements are outdated.

In 2010, *Chapter173-350 WAC, Solid Waste Handling Standards*, was put on the moratorium list to delay rule making. However, in March 2011, it was determined through public comments Ecology's Director received that we would proceed with revisions to the composting standards section, *WAC 173-350-220.*[1]

Through several public meetings, stakeholders identified major issues associated with the compost standards. These issues include:

- ✓ Add the anaerobic digester exemption from RCW 70.95.330; consider adding a section for anaerobic digester facilities that do not meet the exemption from RCW 70.95.330.
- ✓ Explore additional exemptions to recover/recycle more organic materials.
- ✓ Address the regulation of composting odors within Ecology's delegated solid waste management - reduction and recycling authority.
- ✓ Eliminate duplicative recordkeeping and reporting requirements.
- ✓ Clarify existing rule language, process and control requirements, permitting exemptions, and definitions.
- ✓ Ensure consistency with other compost-related rules, laws and policy decisions.
- ✓ Address other issues such as definitions of feedstock types related to Section -220, Composting Facilities.

Evaluating Compost Facility Emissions

Odor at compost facilities has been an issue in several areas of the state. They often result in complaints from surrounding citizens. Compost facilities from each side of the state participated in the emission studies. Staff coordinated scopes of work for three collaborative studies, including:

[1] More information about the rule, including the timeline and listserv signup, is available at http://www.ecy.wa.gov/programs/swfa/rules/rule350.html.

- Working with Washington State University (WSU) to collect emission and feedstock samples. An Interagency Agreement amendment to facilitate WSU's role in collecting and evaluating feedstock and emission samples.

- A new Interagency Agreement with Puget Sound Clean Air Agency to demonstrate a mobile gas chromatograph – mass spectrometer to evaluate emissions.

- A plan to collect emission samples renting existing EPA approved equipment and to develop the capacity for Ecology's Eastern Regional Office staff to sample emissions using their own equipment.

The resulting studies have provided preliminary data about volatile organic compounds and odors released from various locations at compost facilities. Ecology, WSU and Puget Sound Clean Air Agency will distill their data into final summary reports, which may inform the compost rule revision.

More information about the rule, including the timeline and listserv signup, is available at http://www.ecy.wa.gov/programs/swfa/rules/rule350.html.

Criteria for Municipal Solid Waste Landfills Rule Update

Ecology is amending *Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills*. This rule was identified in 2011 by the Director as a rule that will proceed.

EPA amended the federal rule (40 CFR Part 258) that allows states with approved state programs to provide variances from certain criteria for municipal solid waste landfills (MSWLF) to issue Research, Development and Demonstration (RD&D) permits for new and existing MSWLF units and lateral expansions. Ecology needs to adopt these federal regulations in order for Washington to achieve full approval of our solid waste program. The anticipated revisions will impact all municipal solid waste landfill facilities in the state.

The rule making will propose amendments to:

- Adopt new federal regulations and allow for issuance of Research, Development and Demonstration (RD&D) permits. It implements 40 CFR Part 258.4, allowing introduction of water or other liquid wastes.

- Eliminate equivalent and arid design for landfills. The current requirements are a standard design (geomembrane with 2-foot compacted clay) or an "equivalent" design that apply to non-arid locations, and a performance standard that applies to aid locations. The proposed requirements align with 40 CFR Part 258.40 with a composite liner (identical to current "standard design"), or an "alternative" design meeting performance standards that apply to all locations. The approach for the alternative design is very similar to the existing arid design standard.

- Extend greater flexibility for alternate liner designs consistent with federal regulations.

- Address "general housekeeping" issues such as providing clarifications, making formatting changes, and ensuring that the rule is consistent with *RCW 173-350 WAC, Solid Waste Handling Standards.*

Ecology held two informal public workshops where interested persons asked questions about the rule revision and comments on the rule. The first workshop was held in Lacey July 12, 2011 and the second in Moses Lake on July 19, 2011. Based on feedback received by the public, Ecology is revising the rule. Proposed language and public hearings are planned for spring 2012. Ecology will finalize the rule-making order in summer 2012.

Updating Solid Waste Laws

In 2009, Ecology started a process to analyze how best to improve the state's solid waste management laws. While there are about 80 laws that address solid waste management in some way, the main law is *Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling*. This process, while focused chiefly on *Chapter 70.95 RCW*, will also consider other solid waste laws to ensure an effective, coordinated statewide solid waste management program.

Originally passed in 1969 and amended 29 times since then, *Chapter 70.95 RCW* has greatly improved the way we manage our waste. It has helped our state become a national leader in waste management. Waste collection is available for all who want it. Thanks to significant recycling revisions in the law, Washington's 49 percent recycling rate (54 percent recycling/diversion rate) is one of the highest in the country. And this law places waste reduction as the highest priority for waste management in Washington State.

However, while our waste management laws are good, they have not fully kept up with changes in the waste stream. Waste reduction remains our biggest challenge. How do we not make the "waste" in the first place? How do we fund our waste management system as we successfully reduce waste when the main source of funding is based on the amount of waste disposed? For these reasons and more, Ecology recognized our laws need to better address current waste management challenges and help move us "beyond waste."

Ecology developed a multiple-step process to propose updates to state solid waste laws:

1. Identify problems.

2. Prioritize problems.

3. Find solutions.

4. Propose changes.

Of course, each step involves many smaller steps. This will not be an easy process, and we expect it will take a number of years.

In 2010, Ecology met with the public and staff to gather significant input on problems with current solid waste management laws. The thousands of comments received from stakeholders were crafted into one document called *Summary of Problems with Solid Waste Laws in Washington* and is available at: http://www.ecy.wa.gov/biblio/1107018.html. Eleven themes and 79 subthemes were identified and are detailed in the summary document.

Themes of Problems with Solid Waste Laws

- Financing
- Enforcement
- Infrastructure and Materials Markets
- Public Awareness and Education
- Waste Reduction
- Packaging and Products
- Government "Walk the Talk"
- Definitions
- Measurement
- Roles and Responsibilities

Because this list was too large to undertake all at once, a prioritization survey was developed. Based on input from both staff and external stakeholders, we selected a shortened list of problems. This prioritization does not imply that the other issues are not important; it merely directs the initial focus of this project.

The subthemes prioritized through this process come from 6 of the 11 themes (Financing, Enforcement, Public Awareness and Education, Waste Reduction, Packaging and Products, Definitions and Roles and Responsibilities). The full list of selected subthemes is available on the website.

Ecology will evaluate work to date internally. Future stakeholder work is limited because of legislative restrictions and budget constraints.

Where We Want to Go

- In 1989, the Waste Not Washington Act established waste reduction as the highest waste management priority, followed by recycling. Our state has made many accomplishments in waste management, but we have not yet achieved the waste reduction and recycling envisioned in this Act and written into law.

- In 2004 and 2009, Ecology worked with stakeholders to create and then update the Washington's Solid and Hazardous Waste Plan (the Beyond Waste Plan), for managing solid and hazardous wastes. It set a 30-year vision to eliminate most wastes and toxic substances, and use any remaining wastes as resources.

The world of waste is changing. The importance of reducing waste and using waste as a resource – a priority for 22 years in our state - is only increasing, as are calls for policies and programs toward these ends. The goal of the solid waste laws update process is to anticipate these changes and plan proactively. Updating our solid waste laws can help eliminate waste wherever possible, reduce product toxicity, recycle more materials, and safely dispose of residuals. This is our ultimate goal for the law update process.

Anyone interested in this process should sign up on the Solid Waste Laws Update listserv to receive email updates. Additional information on this process is available at http://www.ecy.wa.gov/programs/swfa/7095/.

Current Materials Management Issues

Product Stewardship Programs in Washington

> *"Product stewardship is a policy that ensures that all those involved in a product share responsibility for reducing its health and environmental impacts, with producers bearing primary financial responsibility." (From Product Stewardship Institute). Product Stewardship does not dictate who collects and transports the waste product.*

Product stewardship is common in most developed countries and rapidly growing in use in the United States. Reasons for its popularity include:

- Internalizes the external costs of disposal and recycling that have been historically born by local government and ratepayers. In doing so, it reduces local government cost burdens for collection and recycling products. Instead, those costs are born by producers and direct consumers.

- Encourages producers to design less wasteful, less toxic products.

- Capitalizes on industry's efficiencies at providing services.

Washington now has two product stewardship programs: one for electronics that started in 2009, and one still in development for mercury-containing lights.

The "E-Cycle Washington" (RCW 70.95N) Program provides manufacturer paid-for recycling of TVs, computers, monitors, laptops and e-readers. This program, which started collection in January 2009, has now surpassed the 100 million pound collection mark with no sign of slowing.

The Mercury Lights Program (RCW 70.275), which passed in 2010, will provide collection of mercury containing bulbs used in households, such as compact fluorescents and four-foot tubes. This program is scheduled to start collecting lights in January 2013.

The 2011 Legislative Session saw four more product stewardship bills introduced by a variety of parties, none of which passed. For the third time, the Northwest Product Stewardship Council introduced a bill for pharmaceutical product stewardship. They will return with this bill for the 2012 Legislative Session.

Waste Management introduced a bill in support of product stewardship for medical sharps. One interested senator, after learning of successful recycling efforts in other states, introduced a bill for carpet product stewardship, which may also return this year. Also in 2011, there was a bill to add additional items to the current electronics program. This bill may return in 2012 as well. In addition, we expect a bill for paint and perhaps one for rechargeable battery product stewardship in the 2012 Legislative Session, both introduced from industry.

Although no bills have been or are anticipated to be introduced, there have been local, regional and national discussions on product stewardship for packaging and printed materials. See Chapter 2 for additional information on both programs.

Sustainable Building Materials

Construction and demolition (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, creates a better and higher use for the material rather than disposal and creates needed jobs and economic stimulation. In addition, Ecology is focusing on sustainable building materials involving 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 debris.

Haulers of recyclable materials, including C&D debris, are required to register with Ecology under the *Recyclable Materials -Transporter and Facility Requirements (Chapter 173-345 WAC)*. Those haulers are to transport only materials that are recyclable to a recycling facility.

There are issues surrounding recycling of some construction and demolition debris. In some instances, when this material is taken to a recycling facility there is a certain amount of other waste included that is disposed. There have also been instances where the C&D debris has been taken directly to a disposal facility. Materials that are taken for disposal are to be transported by a regulated waste hauler. Movement outside of their franchise system takes resources away from those companies.

Reductions in funding have limited the staff available at Ecology to follow up on the violators of the recyclable materials transporter requirements, but we do have limited staff to try and assist with compliance.

Managing to Keep Organic Materials Out of Landfills

Organic materials equal about 55 percent of all materials disposed in landfills, and include yard debris, food waste, woody debris, paper packaging, and paper products. Of the material not disposed, composting currently represents the main method of managing organics. And while we will continue to support traditional collection and composting programs, we are also focusing on new organic waste prevention programs and processing technologies.

Ecology invests in WSU's Center for Sustaining Agriculture & Natural Resources (CSANR) supporting research to improve technologies such as high solids anaerobic digestion and pyrolysis. See Chapter 2 for additional information about this research.

These technologies may better manage materials that can be problematic for composting (i.e. food waste) while also enabling the recovery of energy and improved capture and recycling of carbon and nutrients. Developing multiple options for managing organic material will play a key role in solving future energy, climate, and sustainability challenges.

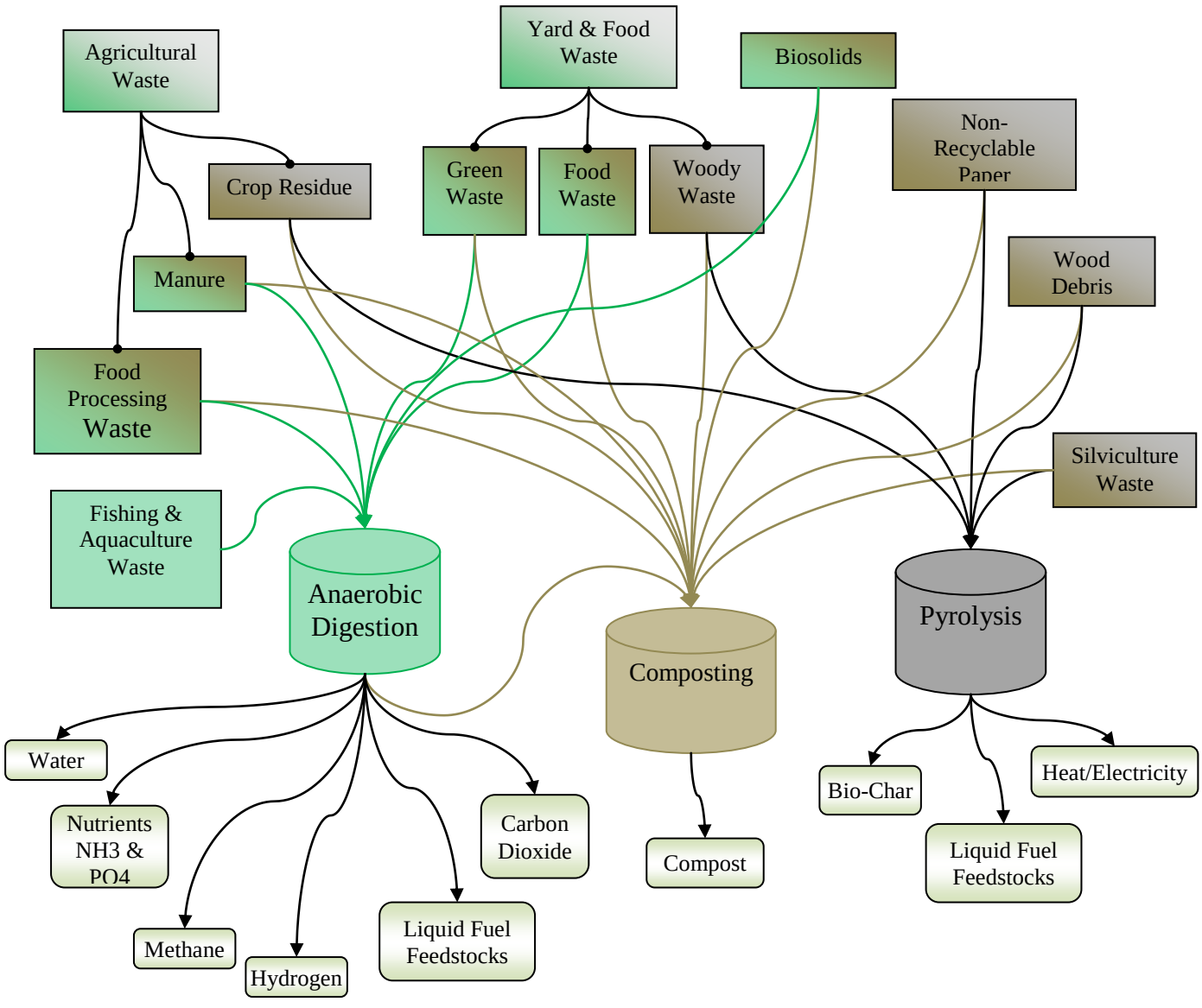
If the discarded organic wastes were recycled using the technologies in Figure 1, instead of landfilled, they could annually:

- Produce an equivalent of 3 million barrels of oil and 300,000 tons of bio-char by pyrolysis (0.8 million tons of CO_2); or

- Produce 6 billion cubic feet of methane by anaerobic digestion; or

- Supply a 65 MW generating facility (Spokane WTE = 22MW) by anaerobic digestion.

Figure 1.1
Technologies for Managing Organic Wastes



Chapter 2: Partnering for the Environment

Building strong partnerships underlies the success of Ecology's Waste 2 Resources (W2R) Program. The W2R Program has worked hard to cultivate 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.

The State Solid Waste Plan (Beyond Waste) – Partners and Progress

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. The first five-year update was completed in October 2009. The vision and goals were developed with the input of numerous stakeholders and partners.

Beyond Waste involves a fundamental shift from managing wastes and toxics to preventing them from generation in the first place. Any wastes that cannot be eliminated can become resources for closed-loop recycling systems.

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.

The plan focuses on hazardous materials and wastes, organic materials, and green building practices. The plan also addresses current solid and hazardous waste management systems.

Implementation of the State Solid Waste Plan

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. The 2010 Legislature reduced W2R's funding from the Waste Reduction, Recycling, and Litter Control Account (WRRLCA) by $7 million and added proviso language that placed limitations on how we can spend the remaining funds. Because of this, Ecology is limited on directly coordinating and implementing portions of the Beyond Waste Plan for this biennium.

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

Because Ecology cannot implement the state plan alone, we rely on the work of our many partners. The vision and goals were developed with stakeholders and partners; many are continuing the work.

Prior to the funding reductions and proviso restrictions effective on July 1, 2011, Ecology was implementing many aspects of the state plan (Beyond Waste). Many activities will be suspended this biennium as discussed in other portions of this report. Some highlights of implementation last fiscal year are listed below each initiative.

- **Reducing Small Volume Hazardous Materials and Wastes**
    - Environmentally Preferable Purchasing (EPP) requirements were added to Ecology's grant programs.
    - The paint industry worked with staff and other Washington stakeholders to bring paint product stewardship legislation to Washington in 2012.
    - E-readers, such as "Kindles" and "Nooks" are now covered items in the E-Cycle Washington product stewardship program.
- **Increasing Recycling of Organic Materials**
    - Started stakeholder and rule revision work to address statutory and regulatory barriers to closed loop organics recycling.
    - Held another popular, successful compost operator training course.
    - Continued research efforts on alternative uses for organic materials, but at a reduced rate due to budget cuts.
    - Increased focus on food waste prevention.
- **Making Green Building Practices Mainstream**
    - Focused this initiative on construction and demolition debris, and toxic building products.
    - The number of certified green buildings continues to increase. More state buildings are reaching higher average certification levels.
    - The first Living Building is under construction in Washington State.

- **Current Issues with Solid Waste**

  - Solid waste financing issues were researched by Washington State University (WSU) and University of Washington Evan's School of Public Policy. Washington State participated in a national dialogue of sustainable financing for municipal recycling.

  - Continued evaluating solid waste laws and regulations in relationship to the changing waste management system.

  - Formed an agency product stewardship team to strategize for the increased focus on this waste management policy approach. Product stewardship bills introduced by others in the 2011 Legislative Session included carpet, increased electronics, pharmaceuticals and sharps.

- **Measuring Progress on the State Plan (Beyond Waste)**

  - Updated and improved the Beyond Waste Progress Report, which provides important performance measures for our program, local government, industry and others.

    - The Beyond Waste Progress Report now contains 7 primary indicators (one for each initiative), and 15 related indictors that track effects of reducing wastes on our environment, economy and society. Each indicator contains a graph, a link to detailed data sets, an analysis of the trend and related links.

    - The primary indictors include: solid and hazardous waste generated and recycled; organic materials recycled and disposed; green building market share; and climate change and ecosystem toxicity indices.

    - Many of the data sets include alternate looks, such as both tons and per capita. Case studies are a new feature of the improved report as well.

    - Some of the new related indicators include: waste composition; population with access to curbside recycling; and construction and demolition materials generated and recycled.

  - The Progress Report is available at http://www.ecy.wa.gov/beyondwaste/bwprog_front.html.

The work of our partners is vital to the success of the state solid waste plan. The plan provides direction for much of the work of our program. It also provides direction for local government's solid waste planning and programs, and others involved in the many aspects of solid waste management.

Ecology will continue to work with our partners to meet regulatory requirements and funding obligations. More information on the state solid waste plan is available at www.ecy.wa.gov/beyondwaste/.

Partnering for the Environment through Sustainable Building Practices

Before July 1, the W2R Program worked to implement one of the key initiatives in the state's solid and hazardous waste plan, Beyond Waste, with an emphasis on "green" or more sustainable building.

The goal was to make green building mainstream in Washington State, thereby saving significant amounts of energy, water and material resources over the life of such buildings. Green buildings lessen the damage to site hydrology from hardscape and storm water, and prompts people to live more sustainably. They also lower the amount of solid and hazardous waste generated by construction. At approximately 40 percent, construction and demolition debris (C&D) is our largest landfilled waste stream category by weight.

The growth of green building in our state is already demonstrating it promotes a healthy economic future, as well as a healthful lifestyle in Washington.[1]

This report summarizes some of the work that was completed in the previous year to help implement the Green Building (GB) Initiative.

Note that the 2011 Legislature reduced funding and placed limitations on our work with proviso language. Several positions previously working on this were not funded. Remaining W2R staff 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.

Making Green Building Practices Mainstream Initiative

During the first five years, seven of the eleven original green building milestones in the Beyond Waste Plan were met. As this period ended in 2009, W2R worked with stakeholders to update this initiative and set new goals for the next five years. These new milestones were intended to be more measurable, integrate with other Ecology priorities, and further work in those areas already identified where greater success could be achieved. The milestones are:

[1] A study by Green Works Realty working with Built Green and King County on certified green homes showed that even in an economic slump, these homes hold their value better than conventionally-built houses, selling "faster for more value (http://greenworksrealty.com/e-cert_report/e-cert_report.php?t=e-cert_report).

- Washington continues to be a leader in green building.
- All new state-funded buildings continue to meet or exceed green building requirements.
- Government continues to identify and remove regulatory barriers to green building.
- Green buildings occupy 15 percent of the total market share for new construction in Washington.
- Ten percent of all certified green building projects achieve credits for use of existing building stock, use of salvaged materials and/or at least 75 percent waste diversion during construction.
- Washington offers degree and certificate programs in green building related trades statewide.
- At least five buildings are built to the Living Building standard in Washington.
- At least 50 percent of all local governments in Washington have adopted green building policies and/or incentives.
- A certification system for green building materials effectively provides verification that products are manufactured in compliance with product stewardship and sustainability principles.
- Authorities adopt policies that require low-impact development (LID) strategies to be integrated into building design and maintenance.
- Energy use in public buildings meets or exceeds Architecture 2030 goals.

Partnering with Others for Waste Prevention

Since it has been shown that *waste prevention* results in significant time and money saved, and since prevention requires demonstrating better methods than those previously used, there are three major areas in which we work:

1. Public involvement and education.
2. Public support.
3. Public service**.**

Public Involvement Presentations/Outreach

Staff were available to give presentations to groups region-wide and at conferences; facilitate public involvement meetings; and develop workshops to train organizations and individuals new to C&D and effective materials management. Because of funding reductions and budget proviso limitations, this work will shift and focus on reduction of the amount of waste from building and the toxicity of materials that go into building.

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

- *C&D Needs Scoping Session*: Convened county and city officials from western Washington to exchange construction and demolition (C&D) program information, and develop a list of needs.

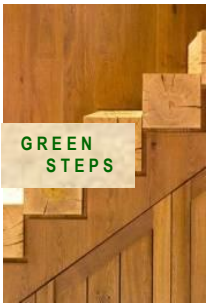
- *Advancing Construction and Demolition Material Diversion in Central and Eastern Washington, Yakima and Spokane.* Facilitated a workshop of county recycling coordinators and other interested parties to begin to devise a materials management strategy for C&D materials in the central and eastern portions of the state.

- *Green Building Jobs Stakeholders Meetings.* Convened two statewide meetings of employment counselors, placement officers, and green skills trainers to coordinate and centralize green job information. While many excellent ideas were exchanged, the work needed to be suspended due to budget cuts.

- *SWANA (Solid Waste Association of North America) Symposium.* Created intensive workshop on the charrette process called "Collaboration, Consensus and Creativity Quickly."

- *King County GreenTools and Built Green's Government Confluence:* Designed and delivered a two-hour workshop to teach facilitation basics jointly with O'Brien and Company staff. The workshop was called "Eco-Charrettes for Affordable Housing."

- *Habitat for Humanity International* ***Green Steps*** *Conference*. Worked with HFHI, Oregon's Earth Advantage Institute, and King County Green Tools to organize a two-day regional conference which included five progressive 1 ½-hour panels of experts.



- *Sustainable Building Advisor Institute Coursework.* Led design of a new Lead Instructor training with its Executive Director and national committee members. Also revised the SBA certifying examination as the Chair of the Board of Directors Curriculum and Testing Committee, and wrote segments for and edited curriculum chapters on the Integrative Process, O&M, Design for Disassembly, and construction waste recycling and salvage.

Public Support

Staff participated as members of nonprofit organizations aligned with our goals; collaborated with business in finding ways to establish a triple-bottom line; and gave technical assistance on Public Participation Grants, green products and procedures to the public requesting help with green goals. This work was suspended this biennium because of funding reductions and proviso limitations.

Technical Assistance to Individual Citizens

As an ongoing service, staff responded to numerous requests for information, ranging from code assistance to what types of previous pavements exist during the reporting period. The website at http://www.ecy.wa.gov/programs/swfa/greenbuilding/ continues to provide general information.

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. Click on the links provided for more details about each of these partners.

- Built Green® Washington and local Built Green chapters. Served on Executive, Steering, marketing, and checklist revision committees in various chapters. http://www.builtgreenwashington.org/

- Habitat for Humanity. Provided technical assistance to the East King County Affiliate; also completed support for a feasibility study of a new Habitat Store proposed in Bellevue. http://www.habitatekc.org/. Assisted in regional conference development for Habitat International. http://www.habitat.org/

- Northwest EcoBuilding Guild. Served as advisory Committee member and technical assistance provided for the Yakima Chapter. Participating Member of the Inland Chapter. http://www.ecobuilding.org

- Green Building Councils:

    - United States Green Building Council (USGBC). Participating member. http://www.usgbc.org/

    - Cascadia Region Green Building Council. Branch steering Committee member, technical assistance. http://cascadiagbc.org/

    - LEED® User Groups. Participating members.

Issaquah's zHome achieved 95% construction waste diversion

- Sustainable Building Advisor Institute. Board Vice President, Committee Chair. http://sbainstitute.org/

- Washington State Recycling Association. Board member. http://www.wsra.net/.

Demonstration Projects and Other Public-Private Sector Efforts

Ecology staff participated in many activities to foster collaboration among sectors that wider adaption of all aspects green building requires. In essence, these outreach activities provide many concentrated, one-on-one opportunities to give brief technical assistance and targeted education, as well as to encourage greater private investment in sustainable strategies, practices and products.

- Built Green Booth at the Seattle Home Show.

- Low Impact Development (LID) Display Garden at the Northwest Flower and Garden Show at the Washington Trade and Convention Center.

- Zero Energy Idea House.

- zHome.

- Spokane Green + Solar Home Tour.

- City of Bellingham/Sustainable Connections "Poticrete" Installation.

Ship's ladder (top) and SIPs (bottom) used in the Idea House

Public Service

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. Because of funding reductions and proviso limitations, some of this work has been suspended for this biennium.

Reducing Barriers

Reducing barriers to high-performance building is one of the toughest, yet most important aspects of our work. It requires the focused, collaborative efforts of and partnerships among public, non-profit and private entities. Also, preventing problems is harder to measure, yet far less costly than regulating once problems have occurred.

This year a number of important advances were made in policy and code that smooth the way for more environmentally-friendly building, particularly regarding energy and water resources.

- With the Department of Health as the lead, *Chapter 246-274 WAC* was established, a new rule that sets requirements for using grey water for irrigation purposes. The rule became effective July 31, 2011. http://www.doh.wa.gov/ehp/ts/ww/greywater/greywater.htm

- Washington's Plumbing Code *WAC 51-56-1600* has revisions proposed to it as to piping systems and signage regarding reuse of reclaimed, grey, and rainwater. http://apps.leg.wa.gov/documents/laws/wsr/2011/18/11-18-087.htm

- Washington has a new, stricter energy code (*WAC Chapter 51-11*) that, after a delay of about six months, went into effect January 1, 2011. It requires a 15 percent reduction in consumption beyond federal requirements for new construction. http://www.energy.wsu.edu/BuildingEfficiency/EnergyCode.aspx. https://fortress.wa.gov/ga/apps/sbcc/default.aspx has additional information on this change.

- The city of Seattle enacted an energy disclosure law requiring nonresidential and multi-family building owners to annually report and disclose energy benchmarking data and performance ratings when requested to any current or prospective buyer, lease agent, tenant, lending agent, etc. Enforcement begins this fall for nonresidential buildings 50,000 sq. ft. or larger, and in April 2012 will include both nonresidential and multifamily residential buildings 10,000 sq. ft. or larger. http://www.seattle.gov/dpd/greenbuilding/ourprogram/energybenchmarkingdisclosure/faqs/default.asp

- Although targeted for release in early 2012, work spearheaded by the Puget Sound Partnership is well underway on a full revision of the LID Technical Manual for Western Washington. Initially published in 2005, a number of local and county jurisdictions have adopted portions of this manual into local ordinances. http://www.psp.wa.gov/LID_manual.php

- We recently identified a rather critical barrier in common contract language that makes it difficult to salvage or recycle building materials, and in some cases prohibits these actions altogether. We will report progress on elimination of this barrier next year.

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

Chemicals permeate every aspect of our lives. Some chemicals, such as those found in medicines, greatly enhance the quality of our lives. Others can have negative impacts on our health and the environment.

Because of their pervasiveness and potential harm, reducing small-volume hazardous materials and wastes is a primary initiative in the Beyond 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, along with any associated hazardous wastes. The state classifies this type of hazardous waste as moderate risk waste (MRW). More information is in Chapter 5 of this report.

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. However, collecting, processing and providing disposition for MRW is expensive. And 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. It would be better to prevent creation of these wastes in the first place.

Ecology is engaged in the following activities to eliminate use of toxic substances in products, making products "greener," thereby preventing the generation of small volume hazardous wastes:

- Work to develop safer alternatives assessment guidance;
- Collaborating with other states to influence regulatory reform at the federal level;
- Work on specific chemical bans such as Bisphenol A and PBDE flame retardants;
- Creation of chemical action plans; and
- Development of environmentally preferable purchasing policies and programs.

Another approach known as "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. Not only does product stewardship shift the burden of end-of-life management from local governments to product manufacturers, it increases recycling of products, which reduces waste. Ultimately product stewardship can lead to product redesign, eliminating the use of toxic substances or making a product more recyclable.

In 2011, Ecology shifted its strategic focus from managing MRW through traditional infrastructure to exploring how to increase the use of product stewardship approaches. Ecology is currently responsible for implementing two product stewardship initiatives: E-Cycle Washington for electronics, and a program for mercury containing lights, due to start January 2013. Product stewardship approaches for management of other MRW items including paint and rechargeable batteries intensified at year's end, with the possibility of industry sponsored legislation in 2012.

In late 2010, Ecology successfully applied for and was awarded Lead Organization status by the EPA for prevention and reduction of toxics and nutrients in Puget Sound, as part of the National Estuary Program (NEP). With this status, Ecology is responsible for administering up to $48 million over six years for projects to prevent and/or reduce toxics and nutrients loadings to the Puget Sound. Ecology received an initial two-year installment of $8.6 million and is now in the process of putting those funds to work. About half of the funding is geared toward toxics projects, and represents significant new resources for this important work.

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. The following pages will discuss some of this work in more detail to explain how we will limit the amount of toxic substances put into the environment.

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. 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 priority initiative and a fundamental principle of the state solid and hazardous waste plan (Beyond Waste).

This 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 and mercury.

In addition, the Children's Safe Products Act was passed in 2008. That law, which envisions a more comprehensive approach to reducing the use of toxic chemicals in children's products, requires manufacturers to disclose their use of certain chemicals.

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 is working 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. Without this data it is difficult to evaluate risk.

- *Understanding how to consider lifecycle impacts*. Back-end consequences such as cleanup or disposal costs are usually not factored into front-end design decisions. As a result, costs for cleanup and disposal 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*. States need 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).

- Work collaboratively with other states to develop consistent approaches to alternatives assessment.

- Continue to focus on persistent, bioaccumulative and toxic chemicals (PBTs) and implementing the PBT rule.

- Continue to develop and implement strategies to reduce diesel emissions and wood smoke.

- Develop a toxics reduction strategy to protect Puget Sound.

Significant Accomplishments in the Last 12 Months to Reduce Toxic Threats

Children's Safe Products Act

Rules to implement the Children's Safe Products Act (CSPA) were adopted in July 2011 (Chapter 173-334 WAC). The rule identifies 66 chemicals of high concern for children and phases in the reporting requirements over a period of years. The reporting schedule is based on both the type of product and size of the manufacturer.

The largest manufacturers will report in August 2012 on their use of the 66 chemicals in products designed for children under 3 years of age, or products designed to be placed in the mouth or rubbed on the skin. The list can be found in the rule, as well as on Ecology's CSPA website (Children's Safe Product Act web page). Ecology will use this data to determine whether additional programs or strategies are needed to protect children.

Ecology developed an online database to make reporting easier for manufacturers. It also makes the data easier to evaluate. The database is almost ready for beta testing, and a number of manufacturers have indicated a willingness to test it.

Many manufacturers of children's products are based out-of-state or overseas, particularly in Asia. We are conducting webinars to help these manufacturers understand the reporting requirements and the database.

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. Key sources of toxics include roofing materials, creosote treated wood, wood smoke, vehicle exhaust, petroleum drips and leaks and urban pesticides. Actions to reduce these sources are being developed.

EPA awarded Ecology $8.6 million to serve as the lead organization to prevent and reduce toxics and nutrients in Puget Sound. As the lead organization, Ecology developed priorities for funding and is in the process of putting those funds to work. Projects include:

- A Request for Proposals to reduce PAH sources such as creosote pilings and wood smoke.
- Preparing guidance for alternatives assessments to assist decision makers in finding safer alternatives to chemicals of concern.
- Adding services to our local source control program which addresses issues pertaining to small businesses that use toxic chemicals.
- Enforcing current product bans.
- Working with tribal interests to develop a realistic fish consumption rate that can be used to establish standards for certain toxic chemicals.

- Evaluating state-of-the-art storm water controls for their ability to reduce toxic loadings.

- Developing a landscaper certification program to reduce impacts from landscaping practices.

Chemical Action Plans for PBTs

The process of developing a Chemical Action Plan (CAP) for polycyclic aromatic hydrocarbons (PAH) began in 2010 and will be completed in early 2012. An advisory committee is being formed which will provide input on the work done to date, as well as recommendations for additional actions to reduce uses and releases of PAHs in Washington.

Work also continues to implement the lead, PBDE, and mercury CAPs. Staff applied for and received funding to develop enforcement procedures for the growing number of consumer product laws. Funding has also been obtained from a grant opportunity provided by the Washington State Office of the Attorney General that will expand our ability to test products.

In future years, we expect to develop a chemical action plan 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 is working with other states 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.

Ecology, in partnership with Boeing, WSU and others, convened a meeting of a broad array of stakeholders to discuss how green chemistry could be advanced in our state. We are currently developing a green chemistry roadmap to create solutions to address the problems posed by chemicals used in products today.

TSCA Reform

Washington continues to provide leadership to states interested in reform of federal toxics policy. Ecology is working with a contractor through funding provided by the Bullitt Foundation to create a consistent, coordinated state voice in federal policy reform efforts. Ecology coordinated a states' response to Senator Lautenberg's TSCA reform bill and on EPA's request for input on how chemicals should be prioritized for action. We also worked with the Environmental Council of the States to bring together state and federal officials, as well as NGOs and industry representatives to discuss issues of mutual interest regarding TSCA reform.

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).[2] 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 three years of program operations (2009-11), all manufacturers participated in the Standard Plan administered by WMMFA. Independent manufacturer plans were proposed in each of the last two years, 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.

[2] *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 recycled *38.5 million pounds* of TVs, monitors and computers.

- In 2010, E-Cycle Washington collection sites took in *39.5 million pounds* of TVs, monitors and computers for recycling.

- 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 5.9 lbs/capita average in 2010.

- More than 270 collection sites and services have been established across the state. Drop-off sites and services are available in every county and every 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 reported that in 2010 approximately 40,000 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.

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 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

In 2010, the Washington State Legislature passed a law that requires producers of mercury-containing lights sold in or into Washington State for residential use to fully finance and participate in a product stewardship program (*Chapter 70.275 RCW, Mercury-containing lights – proper disposal*).

> *"Mercury-containing lights" include lights, bulbs, tubes or other devices that provide functional illumination in homes, businesses, and outdoor stationary fixtures.*
> RCW 70.275.020

Mercury-Containing Lights Product Stewardship Program

The Mercury-Containing Lights law establishes a producer-financed product stewardship program for the collection, transportation and recycling of mercury-containing lights. We are required by law to have this program up and running by January 1, 2013.

Product stewardship is an environmental management strategy that 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 life of the product.

A core principle of product stewardship is the producer's responsibility for their product extends to the post-consumer management of that product. This includes the responsible management of the product and its packaging at the end of its useful life.

Ecology supports product stewardship as a way to:

- Reduce overall human health and environmental impacts from the manufacture, use and disposal of products;
- Increase reuse and recycling;

- Reduce the use of toxics;
- Reduce waste generation;
- Reduce resource consumption;
- Reduce greenhouse gas generation; and
- Shift the cost of managing waste products at the end of their useful life from government to those who produce and use the products.

Mercury-containing lights were chosen for product stewardship 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.

Important dates identified for this program include the following:

- ✓ June 30, 2012 - The sale or purchase of bulk mercury is prohibited.
- ✓ January 1, 2012 - Mercury-containing lights producers submit a product stewardship plan to Ecology for review and approval.
- ✓ January 1, 2013 - Mercury-containing lights product stewardship program fully implemented.
- ✓ January 1, 2013 - No producer may distribute, sell, or offer for sale mercury-containing lights for residential use in Washington unless they are participating in a product stewardship program.
- ✓ January 1, 2013 - All users must recycle mercury-containing lights.
- ✓ January 1, 2020 - Achieve statewide goal of recycling all end-of-life mercury-containing lights.

Mercury-Containing Lights Rule Making Process

In October 2011 the Department of Ecology (Ecology) began the rule-making process for a new mercury lights product stewardship program. Chapter 70.275 RCW requires Ecology to establish rules to implement this program. This rule is needed to clarify product stewardship program requirements.

More information on the rule development process can be found at http://www.ecy.wa.gov/programs/swfa/mercurylights/rulemaking.html.

This rule making implements state law passed by lawmakers in the 2010 legislative session, the rule will:

- Establish the responsibilities of producers, wholesalers, retailers, distributors, and electric utilities to safely manage mercury-containing lights sold in or into Washington State.
- Establish program requirements, such as developing a product stewardship plan, outreach and education efforts, and annual reporting requirements.
- Establish requirements for collecting, transporting, processing and recycling mercury-containing lights.
- Establish how producers will fully fund the product stewardship program.
- Include other requirements necessary to implement the program such as definitions.

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 waste plan (Beyond Waste) encourages state government to increase purchases of environmentally preferable goods and services. Ecology's EPP team includes staff from the W2R and Hazardous Waste and Toxics Reduction (HWTR) programs. 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, protecting Washington waters, and facing climate change.

Laws and Directives

State government is directed through laws and directives to make progress on EPP. Executive Orders 02-03 and 5-01 direct state governments 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 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 2011, the EPP Team responded to more than 80 technical assistance requests from state agencies, local governments, businesses and other entities.

During 2011, Ecology expanded and updated the environmentally preferable purchasing section of the Beyond Waste website (http://www.ecy.wa.gov/programs/swfa/epp/). The website includes:

- ✓ Fact sheets on how to purchase greener electronic products, cleaning products, vehicles and automotive products, office products, building materials, and landscape management services.
- ✓ Information on how green products and services can help agencies save money. Green products often cost the same or less than conventional products. Green products frequently help agencies avoid costs through savings in energy and water use, maintenance, and durability.
- ✓ How to identify rigorous environmental performance levels using standards and certification programs.
- ✓ EPP related laws and directives in Washington State.
- ✓ EPP resource guides on starting an EPP program, life cycle assessment, and green meetings.

In 2010, Ecology established a Green Purchasing listserv to provide another route of communication with interested stakeholders. To join the listserv, visit the EPP website at http://www.ecy.wa.gov/programs/swfa/epp/.

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 Environmentally Preferable Purchasing to align with agency priorities on climate change, reducing toxic threats and resource conservation. Ecology's actions will also help address the Governor's mandate that Ecology lead the way in moving state government to carbon neutrality.

The EPP policy applies to development of agency grants and contracts. In 2011, the Public Participation Grant (PPG) Program incorporated green office and sustainability elements into the 2011-13 Guidelines, PPG application and grant scoring process. All PPG grants scored in 2011 were partially scored on the potential recipient's description of their green office and sustainability efforts.

Ecology also applied the EPP policy to the Coordinated Prevention Grant (CPG) Program for local governments. EPP language was approved and included in the 2012-13 CPG agreement template. An EPP category was added to the Solid Waste Information Clearinghouse as part of final performance analyses (FPAs) so that recipients can include narrative information on their EPP efforts. EPP project ideas were included into the 2012-13 CPG guidelines.

Ecology also developed sample EPP language that agency planners can recommend to local governments to be included in their hazardous waste and solid waste plans.

In 2011, Ecology offered training on green office products and the new EPP policy to agency purchasing coordinators and other purchasing staff. The training promoted reuse of office supplies, and explained how to identify and purchase green office products.

During the training, purchasing coordinators explain that when they get a purchase request from staff, they visit the Reuse Center at Ecology Headquarters before placing an order. Frequently they find the item in the Reuse Center and avoid the cost of a new one.

Reuse Center at Ecology Headquarters

This also saves the cost of the procurement process and avoids many environmental impacts of new items. Since the Reuse Center is located in the shipping and receiving warehouse, warehouse staff does not have to maintain a separate reuse area.

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 closed-loop organics management system where markets for organic-based products are robust, and business thrive by creating new products from wasted organic materials. Through partnerships with other agencies and organizations, the vision for a closed-loop organics management system is becoming clearer.

Partnering with Local Governments and Washington State University to Address Compost Odor Issues

Ecology's Water Quality Program chipped in to help the W2R Program fund several compost facility emission studies. Compost facilities from each side of the state participated in the emission studies, while staff coordinated scopes of work for three collaborative studies, including:

- ✓ Working with WSU to collect and evaluate feedstock and emission samples;
- ✓ Partnering with Puget Sound Clean Air Agency to demonstrate a mobile gas chromatograph – mass spectrometer to evaluate emissions; and
- ✓ Developing a plan to collect emission samples and building the capacity for Ecology's Eastern Regional Office staff to sample emissions using their own equipment.

The resulting studies have provided preliminary data about volatile organic compounds and odors released from various locations at compost facilities. Ecology, WSU and Puget Sound Clean Air Agency will distil their data into final summary reports. These reports will provide baseline information to help us understand the cause and points of generation for compost facility emissions.

Partnering with Washington State Department of Agriculture and Industry to Address Pesticide Contamination Issues

Farmers and gardeners in Whatcom County started to see their crops wither in the field after applying manure and manure based compost. Tests of the soil and plants showed a persistent pesticide used to control broadleaf weeds, *aminopyralid*, was the culprit. Aminopyralid clung to the hay fed to dairy cows and was passed through their systems into the manure. Because this was linked to compost, Ecology worked with the Washington State Department of Agriculture (WSDA) and other stakeholders to create a communication plan. A "first responder" point person at WSDA established a process to answer questions about aminopyralid, its uses and persistent nature in manure and manure based composts.

Aminopyralid did not enter the commercial compost stream through yard debris composting, as it is primarily an agricultural pesticide and was not available to residential consumers. Education and outreach to dairies has effectively contained aminopyralid.

Aminocyclopyrachlor (MAT 28) is a DuPont ingredient in the broadleaf pesticide Imprelis that has also shown persistence through the composting process. When questions about its use and availability to general consumers arose, Ecology worked with the same stakeholders who addressed the clopyralid issue in early 2000: WSDA, WSU, compost facilities and local governments.

Similar to clopyralid, MAT 28 had the potential to enter the residential compost stream through yard debris collected at the curb. Early composting tests of organic matter contaminated with MAT 28 showed that it did not break down in the compost process. This could result in significant plant damage or death, leading to expensive losses for farmers and gardeners using compost. WSDA invited DuPont to meet with the stakeholders, and in response to concerns DuPont agreed to continue research on MAT 28's persistence in compost. While research is ongoing, the Environmental Protection Agency issued a "stop sale" and ordered a recall of Imprelis, based on its link to evergreen tree deaths.

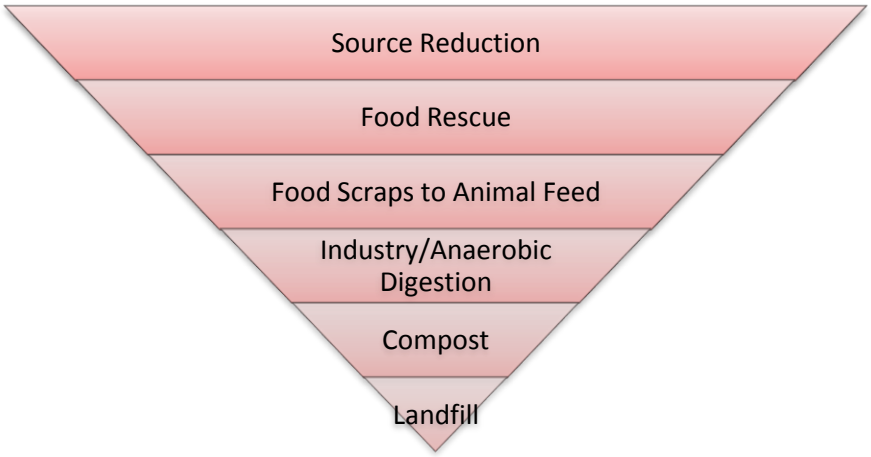
Partnering with Local Governments and Washington Universities to Focus on Organic Waste Reduction and New Processing Technologies

The Organics Initiative milestones reflect an increased emphasis on ensuring adequate infrastructure, accompanying the push for increased organic material collection. And while we will continue to support the viable, traditional collection and composting programs, we are also focusing on new organic waste prevention programs and processing technologies.

Focus on Food Waste

In Washington, we compost a very small portion of the food waste generated. And, as indicated by the 2009 Washington Statewide Waste Characterization Study, food waste represents almost 18 percent of all material disposed of in landfills. The disconnect between processing technology and volumes of food waste generated is apparent.

The focus on food waste includes embracing the Environmental Protection Agency's food waste management hierarchy:



Source reduction, meaning creating less waste that must be rescued, recycled or disposed of, is a priority. Hoping to curb wasteful habits, we are working regionally to identify successful programs that change the way we consume food.

New Organics Processing Technologies

Ecology supports development of new organics processing technologies through Organic Waste to Fuels grants to Washington research universities (see next discussion). WSU is currently developing high solids anaerobic digestion (HSAD) and pyrolysis technologies.

HSAD research may deliver a process that economically treats yard and food waste to recover both methane for fuel or energy, and a soil amendment. Similarly, the pyrolysis process may result in multiple end products, such as biofuels and soil amendments that sequester carbon.

Waste to Fuels Technology

In 2006, the Washington State Legislature directed Ecology to form a partnership with 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. And we continue working 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.

High Solids Anaerobic Digester Project

Capital costs associated with anaerobic digestion are high for constructing large tanks, and ancillary pumps and piping. In addition, day-to-day expenses can be high for operations and maintenance. To address these cost issues, two approaches on HSAD are being evaluated for applicability and scale-up to pilot a commercial scale design:

1. A moderate high solids (10-15% solids) *moderate solids* reactor.

2. An upper high solids (25-40% solids***)*** *leach bed* reactor.

The basis of the WSU HSAD approach is to maintain the pH of the solids in the digester within a range of 6-7 to maximize bacterial breakdown of the material to acids and ultimately to methane. The rapid conversion of organic wastes to acids during anaerobic digestion drives the pH down. However, by transferring acidic liquids from the primary solids reactor to a high rate Up-flow Anaerobic Sludge Blanket (UASB) liquid reactor, a more consistent pH is maintained. Digested liquid leaving the second high-rate reactor is recycled to the solids digester, where it helps maintain near neutral pH and optimum microbial conditions.

Neutral pH allows for methane formation in both reactors. The process eliminates the need for dilution or other forms of pH control to the high rate reactor, improving process efficiency and simplicity.

While the two HSAD designs are distinguished through a neutral operating pH within the primary solids and secondary UASB digesters, both HSAD concepts also emphasize low-energy solids mixing or leaching, minimize recycled solids required for microbial seeding of new solids, and provide for nitrogen and phosphorus fertilizer recovery in the future. Process flowcharts for both designs are shown in Figures 2.1 and 2.2.

Figure 2.1
Flowchart of Pilot Scale Moderate Solids Anaerobic Digester System

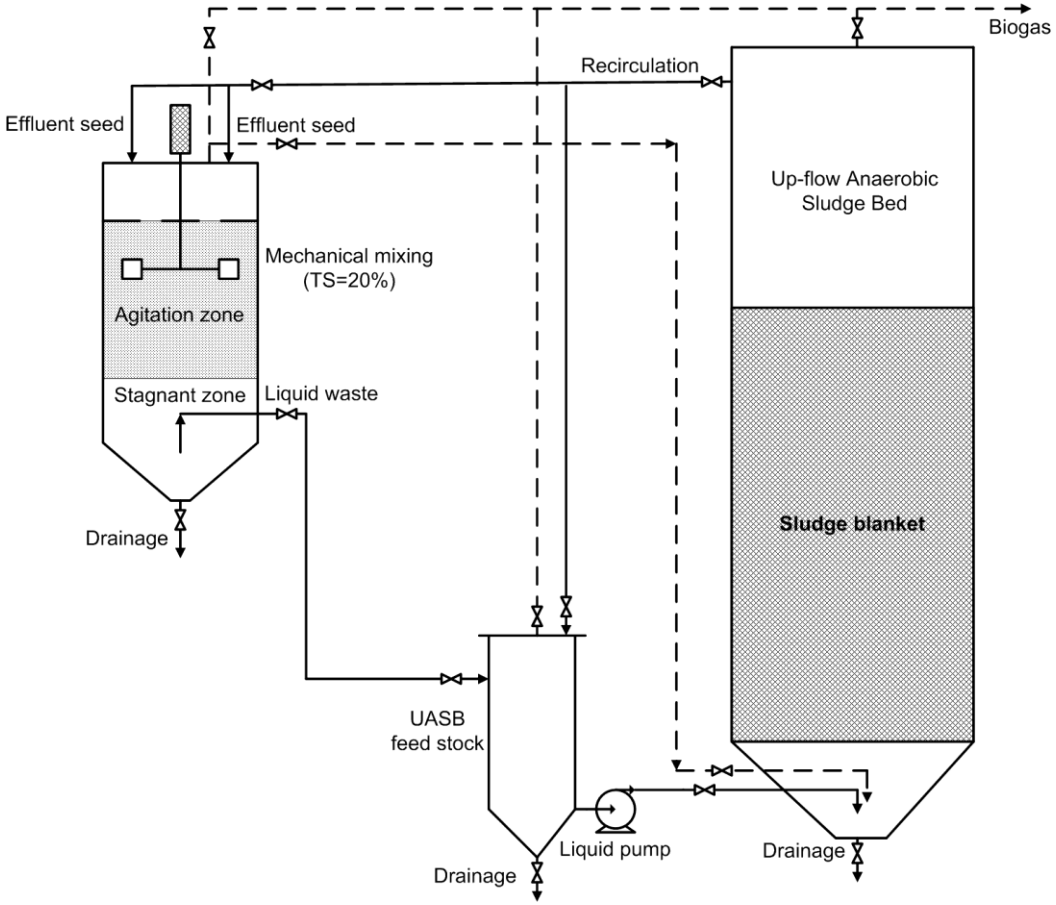
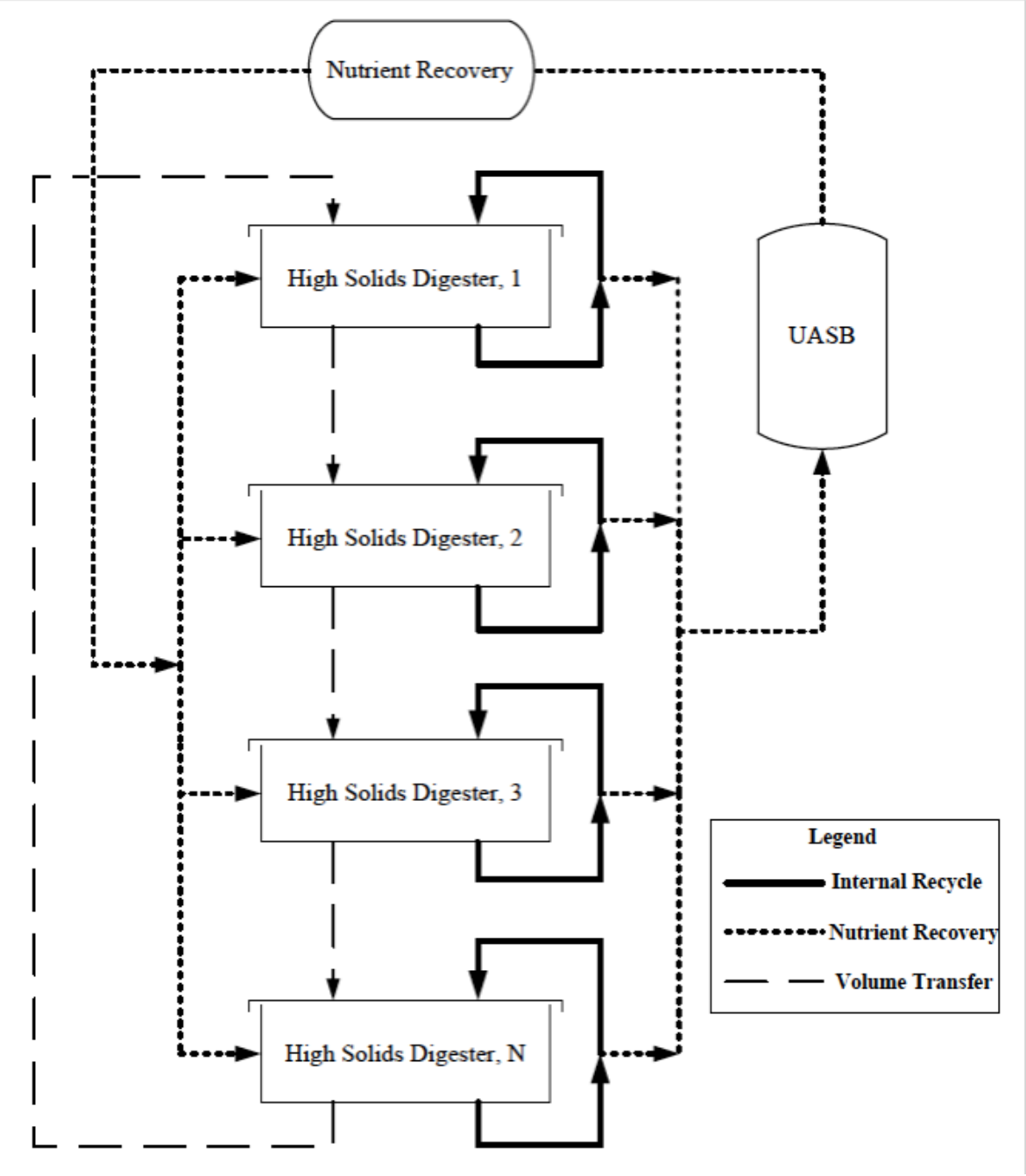


Figure 2.2
Schematic, Flow Pattern and Design Approach of New Batch LBR +UASB System



Final reports from operation of these systems at floor scale are in draft form. Key points include:

- Both moderate solids and leach bed reactors were demonstrated under continuous operation.
- Near neutral pH (6-7) was achieved over extended time periods.

- Near neutral pH operation produced stable high-rate digestion.

- Mixing in the moderate solids design and leaching bed in the high solids design were effective, low operational cost strategies.

- UASB reactors were stable and produced liquids that were further treated to recover ammonia and phosphorous.

- Removing fertilizer ammonia and phosphate from the leachate cleans up the liquids, creating a recycle loop for water reuse.

Pyrolytic Production of Fuels and Biochar

Progress continues on a set of literature review reports that will lay the framework for developing a flexible pyrolysis design capable of running as a slow or fast pyrolysis reactor. Some reviews of historical charcoal production have been completed. But, we are not aware of a comprehensive review completed of pyrolysis from the beginning materials sources through end of process oil condensation and biochar. WSU researchers have completed a review of historic reactor design called *Methods for Producing Biochar and Advanced Biofuels in Washington State Part 1: Literature Review of Pyrolysis Reactors, Ecology Publication Number 11-07-017, Garcia-Perez M., T. Lewis, C. E. Kruger.*

This is the first of a series of reports exploring the use of biomass thermochemical conversion technologies to produce energy, fuels and industrial chemicals and sequester carbon in biochar. The report conducts a comprehensive review of historical pyrolysis reactors and technologies including:

- Criteria to select a reactor type.

- Reviews of historical kilns, retorts, converters and current fast pyrolysis designs.

- Vehicle gassifiers.

- Brief introduction on environmental and safety concerns for woody biomass pyrolysis.

Work is near completion on *Methods for Producing Biochar and Advanced Biofuels in Washington State Part 2,* a review of biomass supply chain handling, drying, and sizing equipment, methods and objectives. Following that will be Part 3, a review of pyrolysis oil condensation, partitioning, and preparation methods for fuel processing, biochar uses and activation processes and regulations in thermochemical production. Part 4 will review the business models for financial, environmental, and social sustainability in the design of pyrolysis systems. Final reports for all these are in draft and near completion.

Organic Waste to Resources

With staff from other agencies on the State Bioenergy Team and Northwest Environmental Business Council, supported directly with funds to the WSU Extension Energy Office, W2R staff assisted in planning and completing the second annual Washington Future Energy Conference. The conference was held in Seattle at the Washington Trade and Convention Center October 18-19, 2011.

Washington Department of Commerce led this conference with the W2R Program's support; the departments of Agriculture and Natural Resources; WSU; University of Washington; and Battelle Pacific Northwest Laboratories.

About 450 people attended the future energy conference. Planning staff are assessing feedback, but good evaluations indicate an ongoing interest in this annual future energy conference for Washington and the Pacific Northwest region. Also, staff anticipates that we need to follow the first year (2010) format that featured a symposium with the conference, which will require additional work.

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. Working with state government, we are suggesting changes to compost specifications and purchasing policies. The changes will increase compost purchases made by government agencies.

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 all things organic.

Each year, WORC hosts Compost Facility Operator Training (CFOT). Students from around the state (and region) gather for one week of lecture and hands-on training at the WSU Puyallup Research Station. Instructors include Ecology and WSU staff, compost engineers/consultants, and compost facility operators.

This training program provides an invaluable opportunity for students and instructors to learn and share ideas on proper operation and regulation of compost facilities in Washington. More than 465 students have completed the training since 1995. This year's training was held October 17-21 with 35 students, 6 instructors and 11 guest presenters/panelists. Since it is the only training of its kind in the state and surrounding area, it attracted students from Hawaii, Oregon, and Maryland.

The training included lectures, fieldwork and field trips. Instructors were compost facility operators, compost consultants, WSU scientists and Ecology representatives. 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 compost and use it. The training also included compost facility tours. Tours included GroCo (Kent), Lenz Enterprises (Stanwood), and Bailey's Compost (Snohomish).

As a result of the training, operators and regulators learn about compost operation challenges, increasing compliance and product quality at compost facilities.

2011 WORC Compost Facility Operator Training

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

Ecology views commercial composting as a key element in the closed-loop organics recycling system. To build consumer confidence, 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.

Composting facilities are regulated under C*hapter 173-350 WAC, Solid Waste Handling Standards*. The composting standards include design and operating requirements for permitted facilities. In addition, testing criteria must be met for the final product to be considered "composted material." *WAC 173-350-220, Composting Facility Standards,* also offers several categories of composting activities that are exempt from solid waste permit requirements. The exemption categories were designed to "promote composting while protecting human health and the environment."

In 2010, 47 (up from 44 in 2009) compost facilities were operating with a solid waste handling permit or conditional exemption for permitting. When biosolids regulated facilities are included, the total facilities that produced compost in 2010 increased to 61. The total materials composted listed in Table 2.1 includes all 61 facilities.

A variety of organic materials were composted and diverted. Table 2.1 highlights some of these materials along with totals for all materials. The total material processed for composting resulted in 1,446,713 cubic yards of finished product. This was up from 1,163,539 cubic yards in 2009.

Table 2.1
Organics Recovery Comparison (tons)

	2009	2010
Composted		
Crop residue	45,171	55,662
Yard debris with food (mixed residential)	5,978	324,493
Food waste, all other	85,216	93,083
Landclearing debris	22,949	44,090
Yard waste	621,421	376,895
Wood waste, all other	15,634	46,959
Other materials composted	99,539	248,432
Total materials composted	895,908	**1,189,614**
Diverted		
Land Clearing Debris	162,989	150,287
Wood for Energy Recovery	613,888	947,177
Yard Waste for Energy Recovery	79,061	37,590
Other diverted materials	192,580	234,589
Total Diverted Materials	1,048,518	**1,369,643**
Total Recovery (Compost + Diverted)	1,944,426	**2,559,257**

Food waste was composted at 17 compost facilities throughout the state (same amount as 2009). Although the amount of facilities accepting food waste remained the same as in 2009, facilities accepted more types of food waste. Food categories include pre-consumer vegetative, food processing waste, yard debris/food scraps and post-consumer food scraps.

Of these facilities, 11 accepted pre-consumer vegetative food scraps, 6 accepted food processing waste, 8 accepted post-consumer food scraps, and 9 accepted other categories of food waste (includes yard/food scraps).

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). Ecology published guidelines to help digester operators manage the additional organic materials (such as food waste) and the resulting digestate under conditions of the permit exemption (Ecology Publication 09-07-029). 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 in pastoral bliss, spreading manure (or *nutrients* as some farmers like to say), effectively fertilizing the lands 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 causes serious 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. EPA estimates 126 of the 65,000 dairy farms in the U.S. use manure digesters (for more information see the EPA's AgSTAR website at http://www.epa.gov/agstar/projects/index.html).

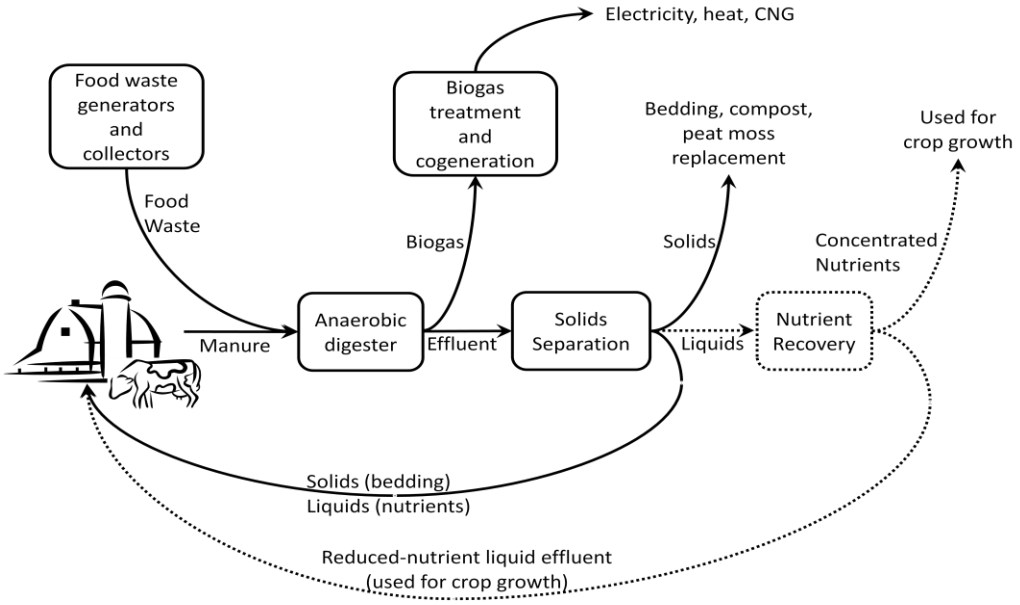
Washington State is just starting to dip its toe into the world of anaerobic digestion of manure with four operating digesters. The Climate Action Team Study estimated that 135 of the 500 dairies in this state could manage manure in an anaerobic digester (dairies with more than 500 cows).

Four manure digesters in Washington are concrete structures 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 or fruit 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 is used to keep the digester warm and can offset fuel purchases on the farm. Excess electricity is 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.



Dairy Digesters in Washington

Today, a handful of dairy farms in Washington use anaerobic digesters to put their cow manure to work generating renewable energy. In 2009, three manure digesters in Washington operated under the conditions of the solid waste handling permit exemption.

Table 2.2 summarizes the energy produced by co-digesting manure and organics in the three operating dairy digesters. The 18,451 megawatt-hours (MW-h) produced in 2010 is enough to power 17,000 average homes in Washington.

Table 2.3 lists the operating digesters and some planned dairy digesters. The W2R Program provided oversight of anaerobic digesters that co-mingle manure and other organics.

The Washington State Department of Agriculture (WSDA) continues to oversee dairies as required under the Dairy Nutrient Management Act. The W2R Program and WSDA collaborate on inspections, record reviews and annual reports. At the end of 2009, operators reported volumes of organics and manure digested. Table 2.2 lists the power produced and volumes of manure and organics digested by the three permit exempted digester operations since 2009. Table 2.3 provides a list of the active dairy digesters in Washington. Map 2.1 shows where these dairy digesters are located around the state.

Table 2.2
Dairy Digesters Total Manure and Organics Processed

Year of Operation	Number of Digesters	Power Produced	Manure Digested	Co-digested Organics
2009	3	7,536 MW-h	44,161,895 gal	9,497,119 gal
2010	4	18,451 MW-h	99,877,150 gal	16,865,223 gal

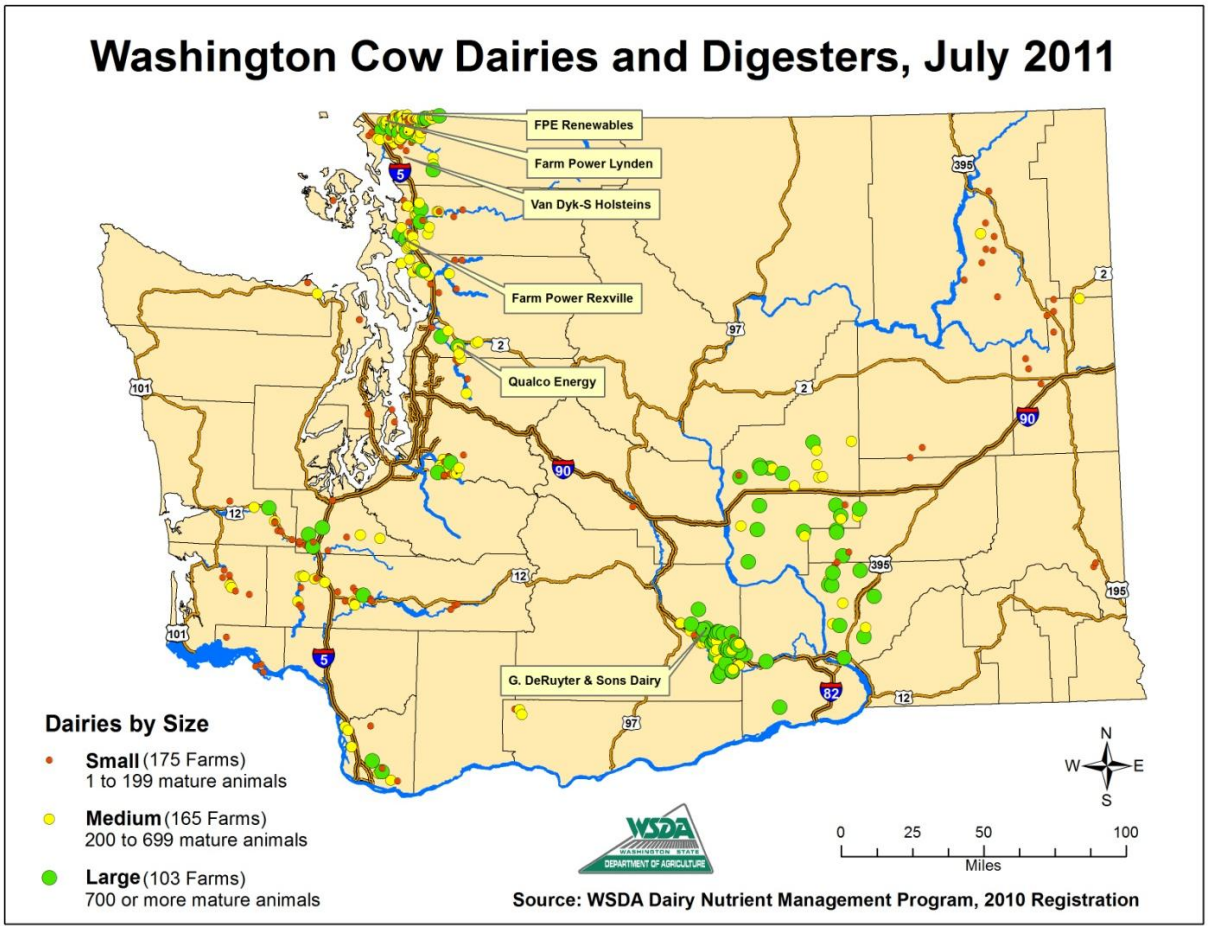
MW-h = megawatt-hours

Table 2.3
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

PSE - Puget Sound Energy
kW - kilowatt

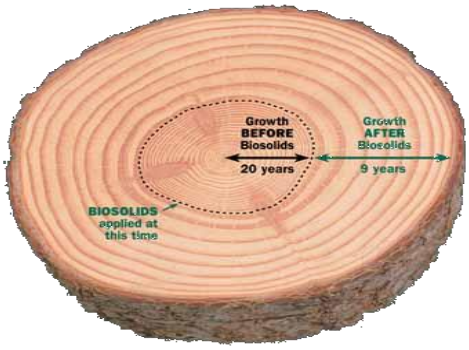
Map 2.1



Partnering for the Environment through Biosolids Recycling and Beneficial Use

Managing biosolids by recycling/beneficial use is the main choice in Washington. 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 2010 approximately 92,000 dry tons of biosolids were managed. Of this amount approximately 80 percent was land applied and 20 percent incinerated; less than 0.3 percent was landfilled. The following photos represent just some of the many uses of biosolids.



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.

All permittees submitted permit applications in late 2010/early 2011. By streamlining the permitting process through changes to the state biosolids rule and the Biosolids General Permit and making greater efforts toward getting necessary information from all permittees, we expect the rate of final approvals provided during the current permit cycle to be much higher than during the previous permit cycles.

Ecology charges a fee to permittees to support the state biosolids program. Currently, the permit fee brings in about $925,000 and supports about 6.0 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)

Beyond Waste is the state plan for managing hazardous and solid waste. This 30-year plan has clear, simple vision: Eliminate wastes whenever we can and use the remaining wastes as resources. The goal of the fifth initiative, *Measuring Progress*, is to help Ecology and its partners make the transition to a long-term data tracking system that measures progress toward the overall vision as well as individual initiatives.

Partnering for the Environment through Waste Tire Prevention

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 is used to prevent and remove illegal tire piles. Funds in this account come from a $1 fee charged on each new replacement tire sold in Washington. Ecology receives a biennial budget of $1 million from the WTRA. These funds are allocated to local governments for tire related efforts across the state.

The projects using these funds in 2010 are listed in Table 2.4. The projects requesting these funds in 2011 are listed in Table 2.5. Ecology plans to continue funding local government waste tire projects with WTRA funding.

Table 2.4
Waste Tire Projects Completed in 2010

Public Entity	Project	2010 Cost
Benton County Mosquito Control	Amnesty collection	$24,882
Colville Confederated Tribe	Amnesty collection	$78,625
Grays Harbor County Health	Amnesty and enforcement	$3,118
Jefferson County Health	Amnesty collection	$6,126
King County Solid Waste	Tire vouchers	$2,385
Kitsap County Solid Waste	Amnesty collection	$42,556
Lewis County Solid Waste	Amnesty collection	$2,996
Mason County Health	Shoreline tire cleanup	$4,020
Moses Lake Irrigation District	Shoreline tire cleanup	$1,616
Skagit County Public Health	Tire vouchers	$6,543
Skamania County	Amnesty collection	$15,000
Snohomish Solid Waste	Amnesty collection	$21,208
Spokane Tribe	Amnesty collection	$4,999
Walla Walla City/County	Amnesty collection	$5,060
Whitman County Solid Waste	Amnesty collection	$5,759
WSU Civil Engineering	Tire shred study	$18,800
TOTAL 2010 FUNDING		**$243,694**

Table 2.5
Waste Tire Projects Completed in 2011

Public Entity	Project	2011 Estimate
Benton County Mosquito Control District	Amnesty collection	$25,025
Clallam County Code Enforcement	Amnesty collection	$30,000
Colville Tribe	Tire pile removal	$91,900
Grays Harbor Public Health	Amnesty collection	$13,950
Jefferson County Public Health	Amnesty collection	$25,000
Kitsap County Solid Waste	Amnesty collection	$45,000
Lewis County Public Health	Tire pile removal	$21,475
Lewis County Solid Waste	Amnesty collection	$2,660
Lincoln County	Tire pile removal	$23,263
Pierce County Public Works	Tire pile removal	$99,000
Rockford Town	Amnesty collection	$5,012
Skagit County Public Health	Voucher for nuisance sites	$10,000
Skamania County Public Works	Amnesty collection	$32,000
Snohomish County Public Works	Amnesty collection	$28,578
Spokane Tribe of Indians	Amnesty collection	$3,645
Walla Walla Community Development	Amnesty collection	$28,465
Wenatchee City	Tire removal and education	$13,950
Whitman County Public Works	Amnesty collection	$9,500
Yakama Nation	Tire removal and education	$14,816
Yakima City	Tire removal and education	$18,637
TOTAL 2011 FUNDING		**$541,876**

Partnering for the Environment through Financial Assistance

Grants to Local Governments - Coordinated Prevention Grants

Coordinated Prevention Grants (CPG) were historically funded by the Local Toxics Control Account (LTCA).[3] However, the 2009-11 funding comes from the State Building and Construction Account (SBCA). LTCA funds were transferred to the General Fund to help balance the state budget. SBCA is funded through bonds that are sold by the state treasurer. Ecology must provide estimates of the cash flow needs for the account. Therefore, using SBCA funding requires development and monitoring of spending plans.

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 greatly reduce contamination of the environment.
- Provide funding assistance to local governments for local solid and hazardous waste planning and for carrying out some 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.

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

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).

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. However, bonding authority through the SBCA provides funding for the 2009-11 Biennium.

Awards

The CPG Program awards funds in two 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 that no one spent during the regular cycle ("unspent" funds). Funds can also come from any special legislative appropriation. Ecology awards offset cycle funds through a competitive process. There was no offset cycle for 2009-10 because of a lack of funding.

The 2009-11 Legislature switched the funding source for CPG to the State Building Construction Account (SBCA). The CPG Program received $10 million for the 2009-2011 Biennium. The $10 million included both the regular cycle projects and Beyond Waste projects:

- $6 million for the regular cycle to help local governments carry out their solid and hazardous waste management plans including recycling, household hazardous waste collection and solid waste enforcement.

- $4 million for grants to fund new organics composting and conversion, green building and moderate risk waste initiatives described in the state's solid waste plan, Beyond Waste. Both regular cycle and Beyond Waste projects began January 1, 2010. CPG identified projects within regular cycle agreements that qualified for Beyond Waste proviso funds totaling $4 million.

The $10 million appropriation was enough to fund estimated spending between January 1 and December 31, 2010, according to spending plans submitted with CPG applications. CPG used unspent funds from the 2009-10 offset cycle and reappropriated LTCA funds to cover costs from January 1 through June 30, 2011. The remaining costs from July 1 through December 31, 2011, were paid out of the 2011-13 appropriation from the Legislature.

In the past, CPG received a full two-year allocation of approximately $21 million and reappropriated unspent funds at the end of the biennium to continue to fund existing agreements that crossed the biennial line. This resulted in substantial funds crossing the biennial line and Ecology decided to end that practice.

Ecology awarded 118 grants to Washington counties, cities, and health agencies totaling $14,773,590 during the regular cycle between January 1 and June 30, 2011.

Table 2.6
CPG Funds Distribution for Each Project Category

	Regular Cycle 1/1/10 – 12/31/11
Organics	$1,506,907
Moderate Risk Waste	$6,595,684
Waste Reduction and Recycling	$4,115,366
Solid Waste Enforcement	$2,434,465
Green Building	$40,192
Other	$80,976
LTCA Funds	**$14,773,590**

Local Government Efforts Implementing Beyond Waste Vision Using CPG Funds

Local governments are carrying out programs that support the Beyond Waste vision. Examples of current projects are described below, highlighting efforts in Green Building, Recycling of Organics and Reducing Threats from Small-Volume Hazardous Wastes. Local government projects that Ecology typically funds include:

- **Organics.** Local governments are helping communities reduce waste from organic materials. Local governments are building or expanding regional composting facilities, setting up commercial and residential food waste collection programs, and offering yard waste chipping options. They are also educating citizens and businesses on options to reduce waste. These options include food rescue programs, and home/onsite composting.

Lewis County Solid Waste Utility (G1000500) used CPG funds to expand recycling and create a composting demonstration site at their Central Transfer Station and coordinate with WSU Cooperative Extension to manage the local Master Recycler Composter (MRC) volunteers. Volunteers assist with community outreach activities.

- **Green Building.** "Green Building" as defined by the U.S. Green Building Council is *". . . design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas: sustainable site planning; conservation of materials and resources; energy efficiency and renewable energy; safeguarding water and water efficiency; and indoor air quality."* Local governments are encouraging construction of high-performance "green" buildings. They educate builders and give public recognition to those who "build green." Local governments also help builders reuse materials and construct demonstration buildings.

- **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 state solid waste plan (Beyond Waste), and increase Washington's recycling rate.

Lincoln County Public Works (G1000461) used CPG funds to fund their Solid Waste Coordinator, Rory Wintersteen. They collected household hazardous waste and recyclables from residents and businesses. They also provided education and outreach to the public. Pictured here, Rory stands next to plastic ready to be baled, bundled and recycled.

- **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.

- **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.

Example Projects

To view details of projects funded in 2010, visit the Solid Waste Information Clearinghouse at https://fortress.wa.gov/ecy/swicpublic/. Select "CPG" and 1/1/2010 in the "Dates Project Active" fields.

Grants to Citizens - Public Participation Grants (PPG)

Purpose

Washington's *Chapter 170.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act* provides for a Public Participation Grant (PPG) Program. Public Participation Grants 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. 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 community oversight of the Hanford, Duwamish River, and Spokane River cleanups.

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

    - Providing information on recycling and sustainability to low-income communities.

    - Providing information for homeowners about the dangers of pesticides and hazardous household products.

    - Educational campaigns to keep toxic materials out of Puget Sound.

Fiscal Year 2011

PPG concluded the 2009-11 funding cycle. In spite of receiving only half of the dedicated funding, PPG successfully completed 32 education and outreach projects. PPG received additional funding from U.S. Department of Energy, encouraged project collaboration between recipients, eliminated duplicative and nonproductive outreach methods, and increased project monitoring. The combination of those factors allowed PPG to complete all 32 projects and responsibly spend 93 percent of project-dedicated funds.

PPG originally received full funding for the 2011-13 funding cycle, which totaled $2.5 million. Due to the decreased funding during the 2009-11 Biennium, many prior applicants opted not to apply for PPG funding. As a result, PPG received only 77 applications for the 2011-13 funding cycle. This represents a 36 percent decrease. Of the applications received, PPG selected 40 for funding. Further budget reductions threaten the majority of 2011-13 PPG funding. The program's current and future status is uncertain.

Table 2.7
Sample PPG Projects for 2011

Organization	County	Purpose	Funding Awarded
Habitat for Humanity of East King County	King County	Divert 400 tons of construction waste in East King County from the landfill.	$80,000
YMCA of Pierce and Kitsap Counties	Puget Sound Basin	Allow 1,000 low-income children to attend YMCA's three-day Outdoor and Environmental Education program.	$75,000
Sustainable Connections	Whatcom	Advance green building in housing and industry and reduce/reuse construction waste.	$75,000
Washington Physicians for Social Responsibility	Statewide	Promote citizen involvement in the Hanford cleanup process. Educate Washingtonians on past, present and future Hanford cleanup developments.	$120,000
Puget Sound Restoration Fund	Whatcom	Engage the public to reduce pollution in order to restore and protect marine waters.	$75,000
Port Townsend Marine Science Center	Puget Sound Basin	Increase citizen participation involving plastics cleanup around the Puget Sound Basin and study plastics accumulation in Puget Sound.	$50,000
Puget Sound Carwash Association	Puget Sound Basin	Provide public education designed to alter current behaviors and prevent carwash contaminants from entering Puget Sound.	$23,000
Facing the Future	Statewide	Complete an environmental sustainability curriculum that reaches 10,000 students.	$75,000
Washington Lodging Association	Statewide	Increase environmental awareness and reduce waste in Washington hotel industry.	$85,000
Olympic Environmental Council	Clallam	Engage citizens in Rayonier Mill cleanup and restorations.	$50,000
Skykomish Environmental Coalition	King	Engage citizens in BNSF cleanup and restorations in the town of Skykomish.	$25,000
The Lands Council	Spokane, Stevens, and Lincoln	Involve ethnically diverse members of the public on Spokane River cleanup and restoration.	$42,000
Yakima Valley Habitat for Humanity Store	Yakima	Increase the operation level of construction material reclamation by at least 12 percent (120 tons).	$75,000
Neighborhood House	King	Provide waste reduction education to economically disadvantaged neighborhoods.	$45,000
Institute for Neurotoxicology and Neurological Disorders	King and Snohomish	Identify sources of potentially unhealthful toxics and odor from large-scale compost operations.	$48,000

Organization	County	Purpose	Funding Awarded
Spokane Neighborhood Action Partners	Spokane, Stevens, and Pend Oreille	Educate Eastern Washington citizens on waste reduction and household toxics elimination.	$40,000
Northwest Straits Marine Conservation Foundation	Puget Sound Basin	Reduce the number of derelict crab pots and inform the public of the environmental damage caused by abandoned crab pots.	$58,000
Salish Sea Expeditions	Puget Sound Basin	Educate Washington middle school and high school students on the environmental health of Puget Sound.	$65,000
White River Valley Museum	Pierce and King	Educate adults and children on waste reduction on small farms.	$45,000
Heart of America NW	Statewide	Provide information and citizen participation opportunities focused on the cleanup of Hanford.	$120,000
Heart of America NW Research Center	Benton	Provide information and citizen participation opportunities focused on the cleanup of low-level radioactive waste at the state-leased US Ecology site.	$40,000
Brackett's Landing Foundation	Snohomish	Encourage community involvement in cleanup decisions at the UNOCAL/Chevron site.	$40,000
Adopt-A-Stream Foundation	King and Snohomish	Encourage citizens to adopt procedures that reduce North Creek water pollution, and engage watershed schools to monitor North Creek.	$80,000
Lake Roosevelt Forum	Lincoln, Stevens, Ferry, and Grant	Improve community engagement and understanding of Lake Roosevelt RI/FS	$45,000
Spokane River Forum	Spokane, Stevens, and Lincoln	Increase community awareness regarding toxics entering the Spokane River and developing community hazardous waste reduction strategies.	$45,000
Stilly-Snohomish Fisheries Enhancement Task Force	Snohomish and Island	Educate students on the Puget Sound watershed, water quality, storm systems, and non-point source pollution.	$75,000
People for Puget Sound	Snohomish	Provide education and outreach regarding the Port Gardner Bay cleanup to community members.	$70,000
WSU Foundation	Pierce, King and Thurston	Educate businesses on stormwater pollution sources and prevention methods.	$70,000
Duwamish River Cleanup Coalition	King	Provide education and outreach regarding the Duwamish River cleanup to community members.	$95,000

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*, C*hapter 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*, C*hapter 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 Beyond Waste Plan 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. Table 2.8 lists local solid waste plans and hazardous waste plans for each county and one city (Seattle) that do individual plans.

Table 2.8
Current Status of Solid & Hazardous Waste Plans
in Washington as of November 2010

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. Hazardous Waste Plan (HW) is joint with Adams, Lincoln and Grant Counties.
Asotin	1998	26% by 1997	1993	No	Preliminary Plan review completed. Awaiting final draft for plan dated April 2010.
Benton	2007	50% by 2020	1991	Yes	Drafting for new CSWMP will begin January 2012
Chelan	2007	25% recycling rate by 2010 5% reduction from the current waste stream by 2010	1990	Yes	CSWMP updated April 2007.
Clallam	2007	30% in next 5 years, 40% long-term goal	2007	No	Drafting for new CSWMP will begin January 2012 starting SWAC review of plan(s).
Clark	2008	50% WRR by 1995	2008	Yes	CSWMP approved.
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	2008	50% WRR by 1995	1993	Yes - See comments	CSWMP approved. Scheduled to update the hazardous waste plan as a chapter within the CSWMP during 2010-11. Preliminary Draft submitted to Ecology September 2011.
Douglas	2010	10% residential recycling, 10% commercial recycling, and 20% public sector recycling by 2015	2010	Yes	CSWMP approved October 2010.
Ferry	2011	35% WR/R by 1995 50% WR/R by	2011	Yes	Plan completed and approved.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
		2013			
Franklin	1994	35% R by 1995 5% WR by 1998	1993	No	Preliminary plan reviewed. Adoption of final plan expected in first quarter 2011.
Garfield	2008	26% WR/R by 1997	1992	No	CSWMP approved September 2008.
Grays Harbor	2007	50% WRR by 1995	1991	No (see comments will be Yes)	As of November 2011, SWMP w/HWP in final internal review-ready to submit for Ecology review by December 2011.
Island	2008	Assist the State in achieving its goal of 50%	2008	Yes	Plan approved April 1, 2008.
Jefferson	2008	At 46.1% using state definition, goal of 50%	1991	No	Considering a review of HW plan.
King	2002	50% residential by 2006 43% nonresidential by 2006	2010	No	Latest CSWMP calls for targets to be evaluated every 3 years as new data becomes available. CSWMP draft update went out for public comment on October 8, 2009. The preliminary draft will be submitted to Ecology in December 2010. Because the city of Seattle and King County have independent CSWMPs, the HW plan remains independent. The HW plan was approved on July 8, 2010.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
King - Seattle	2005	Overall recycling rate by 2015: 55% Overall recycling rate by 2020: 70%	2010	No	Latest CSWMP approved May 10, 2002. 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 on July 8, 2010. CSWMP update began in 2006. The draft update was released for public comment from October 8 - February 4, 2010. The preliminary draft was submitted to Ecology on April 1, 2011. Ecology submitted comments on the preliminary draft on August 1, 2011.
Kitsap	2011	Supports the state goal of reaching 50% recycling.	2011	Yes	The final draft of the combined CSWMP/HWMP update was submitted on May 5, 2011 and approved by Ecology on June 14, 2011.
Kittitas	2003	50% by 2008	1991	Yes	CSWMP currently in drafting and approval process. Completed SEPA checklist, currently awaiting public comments before submitting preliminary draft.
Klickitat	2000	50% diversion	2000	Yes	Final chapters are being reviewed and the last SWACs before submission are coming up.
Lewis	2008	18% WRR by 1995, no goal	2008	Yes	
Lincoln	1999	35% WR/R by 1997	1992	No	Preliminary plan review completed. Awaiting final draft submission.
Mason	2007	Mentions state goal of 50% by 2007	1991	Yes	Currently in review to update both SW & HW plans.
Okanogan	2006	Supports the state goal of reaching 50% recycling	2006	Yes	Currently in the process of producing an initial CSWMP draft for 2012.
Pacific	2006	At 14.4% in 2005, goal to reach 25%	1990 – 2000 Operations	Yes	HW plan will be chapter to next SW update Update to start early 2012

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
			Plan		
Pend Oreille	2002	45% WR/R by 2015	1993	No	Preliminary plan review completed. Awaiting final draft for review.
Pierce	2008	50% WRR by 1995	1990	No	Updating a separate HW plan during 2010-11. HD dragging review and submittal of HW plan.
San Juan	1996	50% by 1995	1991 (with 1998 update that includes used oil plan)	No	Has begun plan update, and is combining HW and SW plans. Plan completion possible in 2012.
Skagit	2005 (amended 2008)	50% diversion	1992	No	Has just started update process for SW plan. No plan to update HW plan. Possible completion 2013.
Skamania	2001	40% WRR by 1998 50% long range goal	2001	Yes	Ecology started update of plan in September 2011.
Snohomish	2004	Supports the state goal of reaching 50% recycling.	1993	Partially	The 2001 CSWMP is intended to begin consolidation of the HW Plan to update but not replace it. The CSWMP was updated in 2004 to include replacement of two solid waste facilities and include the city of Everett under the county's solid waste system. The County began updating the CSWMP and HWMP in 2009. The public comment draft of the plan update was posted October 2011.
Spokane	1998	50% recycling by 2008	1993	No	Final CSWMP draft adopted by County Commissioners and circulated to local governments for adoption. Expect completion by end of 4th quarter 2010.
Stevens	2008	36% WR/R by 2012	1993	No	CSWMP completed and approved in July 2008.
Thurston	2001	Increase recycling rate by 2.5% by 2005	1993	No	County and HD dragging review and submittal of drafts.
Wahkiakum	2007	20% WRR by 1996	2001	No	Will not have a county hazardous waste plan. Wahkiakum service is

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
					included in the Cowlitz County plan update start in 2012.
Walla Walla	1994	40% by 2002	1991	No	City of Walla Walla by inter local agreement assumed responsibility for preparation of CSWMP. New staff hired. SWAC reconstituted. Consultant RFQ under preparation. Waiting for new CPG funding cycle to qualify for planning grant.
Whatcom	2010	50% diversion	2010	Yes	New combined SW-HW plan approved 2010, but dated 2008. Note: This new plan is to be read concurrently with the previous SW and HW plans (3 books at once). We don't allow this practice anymore.
Whatcom	1999	50% diversion	1991	No - Soon.	County currently updating CSWMP. Received draft in November 2008, and it is almost in final form. The city of Bellingham is no longer the lead on MRW, and the county has combined SW and HW plans.
Whitman	2006	40% WR/R by 2001	1992	No	Plan approved and current. Plan revisions currently under consideration.
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.

Partnering for the Environment through Outreach, Assistance and Information Sharing

Washington State Solid Waste Information Clearinghouse

The year 2011 marked the second anniversary the completed site was in use (https://fortress.wa.gov/ecy/swicpublic/). As of October 2011, the site had 209 registered users and contained 917 projects, 877 resources, 250 solid waste staff contacts and 101 health department staff contacts.

Now that the site is fully functional, the main challenge is getting the local city and county profiles populated with data. This relies on a partnership between Ecology and local governments, as each is responsible for updating various pieces of the profiles. Ecology will put more emphasis on marketing the site in the coming year, and will continue to maintain the site to ensure it becomes the resource local governments envisioned nearly a decade ago.

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 lessons learned with others statewide. This helps all recipients to strengthen their programs. The site also contains information on Public Participation Grant (PPG) projects, as well as non-grant funded projects submitted by local governments. The system will collect and maintain information about county and city programs, and facilitate sharing tools and resources.

The main audience for this site is local government solid and hazardous waste and health department staff. The site became accessible to the public in late 2008. The Information Clearinghouse includes:

- State Profile
- County and City Profiles
- Local Projects
- Outreach Materials & other Resources
- Calendar of Events
- Classified Ads

To learn more 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 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 2010, there were 181 active certifications for landfill operators and 68 active certifications for incinerator operators.

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 technical 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.

Recognizing Waste Reduction and Recycling Efforts: Terry Husseman Sustainable School Award Program

Ecology's School Awards Program recognizes Washington's primary and secondary schools for developing and managing environmental education and sustainability programs. Both public and private schools are eligible to apply. Schools are selected for creative features of their programs and ability to promote sustainable behavior change by reducing waste, increasing recycling, and conserving resources. The program rewards schools for developing innovative environmental curriculum or operating successful programs that inspire a sense of environmental stewardship in students.

Because of proviso limitations and funding reductions passed by the 2011 Legislature, the W2R Program suspended the Terry Husseman Sustainable School Awards for 2012 and 2013. The funding reductions also resulted in the 2011 recipients receiving their awards through the mail instead of being honored at the traditional awards ceremony.

Awards are presented in three categories:

1. The *Seed Award* assists schools with costs of starting waste reduction, recycling and sustainability programs. In 2011, 13 schools received Seed Awards ranging from $150 to $2,300.

2. The *Sustainable School Award* helps schools continue and expand ongoing programs that focus on waste reduction, recycling and sustainability. In 2011, 18 schools received Sustainable School Awards ranging from $500 to $1,000.

3. The *Environmental Curriculum Award* encourages schools to develop original curricula to teach environmental awareness in Washington schools. It should introduce students, teachers, staff and administrators to concepts of sustainability including social, economic and environmental relevance. In 2011, no schools submitted an application in this category.

Table 2.9 lists the 2010-11 winners of the Terry Husseman Sustainable School Awards.

Table 2.9
2010-11 Terry Husseman Sustainable Public School Award Recipients

School	School District	County	Award Amount
Seed Awards			
North Olympic Peninsula Skills Center	Port Angeles	Clallam	$1,700
Lakes Elementary	North Thurston	Thurston	$1,600
Olympia High School	Olympia	Thurston	$1,500
East Omak Elementary	Omak	Okanogan	$2,300
Twin River Community Facility	Richland	Benton	$600
Tri Tech Skills Center	Kennewick	Benton	$1,000
Inglemoor High School	North Shore	King	$804
Explorer West Middle School	Private	King	$1,100
Green Gables Elementary	Federal Way	King	$1,500
St Edward Parish School	Private	King	$2,000
Explorations Academy	Private	Whatcom	$800
Stanwood Middle School	Stanwood-Camano	Snohomish	$150
Edison Elementary	Burlington-Edison	Skagit	$500
Sustainable School Awards			
Creston School	Creston	Lincoln	$1,000
Washington-Hoyt Elementary	Tacoma	Pierce	$1,000
Eagle View Christian School	Yelm	Thurston	$500
Methow Valley Elementary and Liberty Bell High School	Methow Valley	Okanogan	$1,000
Southridge High School	Kennewick	Benton	$500
Camelot Elementary	Federal Way	King	$1,000
Somerset Elementary	Bellevue	King	$1,000
The Overlake School	Private	King	$1,000
West Sound Academy	North Kitsap	Kitsap	$1,000
St Alphonsus Parish School	Private	King	$1,000
International School	Bellevue	King	$1,000
Villa Academy	Seattle	King	$1,000
Orca School	Seattle	King	$1,000
Crosspoint Academy	Crista Ministries	Kitsap	$1,000
Samantha Smith Elementary	Lake Washington	King	$500
Creekside Elementary	Issaquah	King	$500
Woodinville Montessori School	Private	King	$500
Northshore Christian Academy	Northshore	Snohomish	$500

The Closed-Loop Scoop Newsletter

The W2R Program published a quarterly newsletter called *The Closed-Loop Scoop*. The newsletter shared important information among public works departments, health districts, private recyclers, Ecology, and other clients and stakeholders. The editor encouraged all interested parties to contribute articles to update readers on legislative matters, solid waste program successes and ideas, and upcoming meetings. More than 700 individuals and

organizations across the state subscribed. Because of budget reductions, the Closed-Loop Scoop Newsletter is not being continued. Past issues of *The Closed-Loop Scoop* are available on the Ecology W2R Program Publications and Forms website at http://www.ecy.wa.gov/programs/swfa/nav/publication.html.

Recycling Information Line

The W2R Program operates a 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 a first contact for many. Ecology's statewide hotline can also provide callers with information on 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 the public to local electronics recycling locations. It will also be part of the new mercury lamps program under development. The information line is also a source for locations to recycle wood stoves for programs implemented by Ecology's Air Quality Program.

Information line operators use a database to direct callers to locations for safe disposal of household hazardous waste, in addition to recycling facilities across the state. Information on a wide variety of recyclable materials including construction, demolition and land clearing debris, used motor oil and electronics is available. The information line also lists companies that offer commercial pickup for business recycling and residential curbside haulers. Budget reductions have greatly reduced the number of hours the information line is staffed by live operator.

With reduced resources to staff the information line, an alternate source of recycling information is the database available on the information line's website at http://1800recycle.wa.gov. Ecology staff maintains the database by periodically contacting all recyclers to determine commodities handled, location (or areas served) and hours. This website also provides links to other online databases and material exchanges, along with local government and recycling organization websites. Reduced resources have affected updating this website, but efforts continue to maintain it as best as possible.

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. In 2010, work on litter control and litter prevention activities was significantly reduced due to budgetary constraints. We were unable to fund a litter prevention campaign or conduct a litter survey. Funds for litter pickup efforts were reduced. With limited funding, Ecology put forward the following efforts in litter control and pickup:

- Helped coordinate reduced litter pickup activities. Managed allocations from the Waste Reduction, Recycling and Litter Control Account (WRRLCA) for other state agencies.
- Deployed 27 summer Ecology Youth Corps (EYC) litter cleanup crews statewide. Also deployed 6 Ecology median crews in spring and fall.
- Administered a reduced Community Litter Cleanup Program (CLCP).
- Maintained productive partnerships with other state agencies and local governments.

The 2011 Legislature again reduced funding to WRRLCA for the 2011-13 Biennium. Funding for litter pickup for this biennium is being directed to the Department of Corrections (DOC) and EYC. 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 2010 or early 2011. There is no funding or staff for a prevention campaign for the 2011-13 Biennium.

Secured Load Materials and Website

There was no secured loads campaign in 2010 or early 2011 other than the enforcement activity described below. There is no funding for a secured loads campaign in 2011-13. 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, the Washington State Patrol (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.

Because of the budget reduction to WRRLCA for 2011-13, WSP is not receiving any funding for the biennium from Ecology for litter enforcement patrols.

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, 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.

Litter Program Fund Allocation

WRRLCA supports a variety of programs. The legislation (*Chapter 70.93 RCW*) directs fund allocation as follows:

- 20 percent to local government programs (CLCP).
- 30 percent to waste reduction and recycling efforts within Ecology.
- 50 percent to litter cleanup and prevention efforts, as well as administrative costs.

The Legislature suspended the allocation formula for the 2009-11 Biennium. In 2009 there was a $4.4 million cut to the Litter Account, and an additional $2.09 million cut taken in 2010 (approximately $6.5 million for the biennium). This was more than one-third of the entire WRRLCA budget for 2009-11.

The Legislature cut the 2011-13 WRRLCA budget by $7 million and again suspended the 20/30/50 allocation requirements for FY 2011-13.

Funding for 2011-13 is as follows:

- $2.2 million to Local Government Funding Programs.
- $3.5 million to Waste Reduction & Recycling Activities.
- $4.99 million to Litter Cleanup & Prevention.

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 cut funding completely to WSDOT, WDFW, and Parks. Only DOC saw their funding remain the same.

Ecology Youth Corps

2011 marked the 36th year of operation for the Ecology Youth Corps (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 2,000 youths from across the state apply annually for approximately 300 positions. Youth crews generally work two four-week

summer sessions with a complete turnover of crews occurring mid-summer. In 2010, funding cuts prevented us running summer EYC crews. We were able to return to operating youth litter crews in summer 2011, although it still was a reduced effort compared to past years.

During the 2011 EYC crew season, litter on state highways was collected in the following counties:

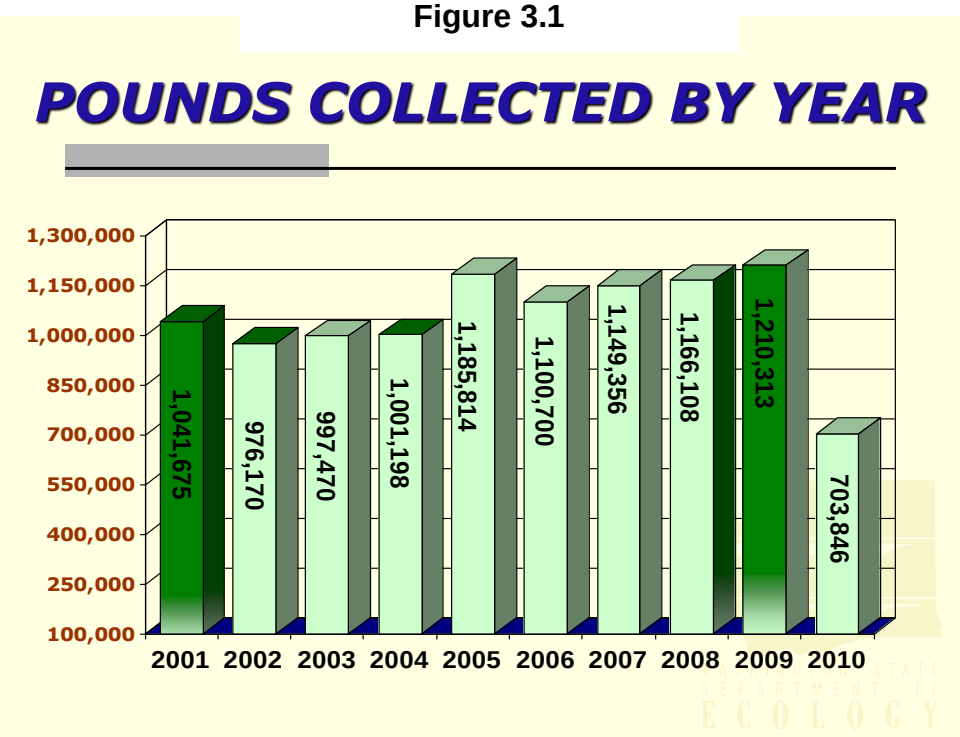
- ✓ Central Region (CRO): Benton, Kittitas, and Yakima.
- ✓ Eastern Region (ERO): Adams, Asotin, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens and Whitman.
- ✓ Northwest Region (NWRO): King, Skagit, Snohomish, and Whatcom.
- ✓ Southwest Region (SWRO): Pierce, Thurston, Grays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

The most recent totals for the EYC program are for the 2010 crew season. The comparison with 2009 is shown in Table 3.1. The inability to run summer crews in 2010 is reflected in the reduced number of pounds collected in comparison to previous years, as also shown in Figure 3.1.

Table 3.1
Ecology Youth Corps Program Outputs
2009 and 2010

	Jan-Dec 2009	Jan-Dec 2010
Total Hours Worked (Supervisor + Crew)	71,351	34,778
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,210,313	703,846
Miles	5,313	2,747
Acres	475	423
Number of Illegal Dumps Cleaned	157	163

Figure 3.1



Ecology continues to operate the EYC in partnership with WSDOT. WSDOT hires the crew supervisors, and Ecology manages all other aspects of the program. The interagency agreement covering this arrangement between Ecology and WSDOT expires in June 2013.

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. Because of the budget reduction to WRRLCA for 2011-13, there is no funding to conduct a litter survey in 2011 or 2012. 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.

For the budget cycle that began in July 2009, Ecology awarded $2.685 million in CLCP funding. All 39 counties applied for and received funds. However, due to budget cuts in 2010, Ecology had to later cut the awards the counties received in half to $1.36 million.

Table 3.2 highlights the work accomplished through CLCP for 2009 and 2010. Because of the budget reductions in 2010, the numbers were significantly reduced. In 2010 there were approximately 73,000 fewer hours worked, resulting in more than 1.2 million less pounds of litter picked up.

Table 3.2
Community Litter Cleanup Program Outputs

	Jan–Dec 2009	Jan-Dec 2010
Total Hours Worked (Supervisor + Crew)	166,701	93,335
Total Pounds Collected (Litter + Illegal Dump + Recycled)	3,078,546	1,826,822
Miles	24,794	18,647
Acres	2,179	978
Number of Illegal Dumps Cleaned	3,149	2,367

The CLCP does have $2.2 million available for the 2011-13 Biennium, which is slightly less than past normal years.

Litter Cleanup by Other State Agencies

Because of Legislative reductions to the WRRLCA for 2009-11, state agencies saw a decrease in funding from previous years. Additional budget reductions to WRRLCA for 2011-13 have further impacted state agency litter pickup budgets. WDFW, WSDOT, and Parks were eliminated from the budget. DNR was reduced to $320,000. Only DOC kept their same level of funding. Table 3.3 shows the budget for three biennia.

Table 3.3
Ecology Interagency Agreements for Litter Activities
July 1, 2009 – June 30, 2011

	07-09 Biennium	09-11 Biennium	11-13 Biennium
Department of Corrections	$625,000	$620,000	$620,000
Department of Fish and Wildlife	$ 27,500	$2 0,000	0
Department of Natural Resources	$520,000	$415,000	$320,000
Department of Transportation	$ 88,000	$ 85,000	0
Parks and Recreation Commission	$ 75,000	$ 40,000	0
Total	$1,335,500	$1,180,000	$940,000

Parks and Recreation Commission

The Parks and Recreation Commission (Parks) traditionally uses litter funds for waste reduction and recycling efforts, as well as litter and illegal dump cleanup. Park rangers, park users and volunteers do most litter collection. For information on Park's accomplishments, see the "Parks" section on the litter website at http://www.ecy.wa.gov/programs/swfa/litter/who.html#a7.

For the 2009-11 Biennium, Parks' litter funding was reduced by $35,000, bringing the interagency agreement total to $40,000. Parks cleaned up litter and illegal dumps, and increased recycling in parks statewide. Their limited funds supported enforcement projects such as purchasing surveillance cameras and additional signs. In 2010 they picked up 54,395 pounds of litter.

Because of the budget reduction to WRRLCA for 2011-13, Parks is not receiving any funding for the biennium.

Department of Fish and Wildlife

The Department of Fish and Wildlife (WDFW) receives funding through Ecology to support volunteer efforts to pick up litter through their Adopt-an-Access Program. Funds also support purchase of litterbags, signs, volunteer mileage, gloves, hats, dumpster rentals, WCC crew time, and tipping fees. Table 3.4 summarizes WDFW's litter removal efforts for 2010.

Table 3.4
Department of Fish & Wildlife Litter Removal Activity
January 1 – December 31, 2010

Total Hours Worked (Supervisor + Crew)	684
Total Pounds Collected (Litter + Illegal Dump + Recycled)	51,040
Acres	226
Number of Illegal Dumps Cleaned	Unknown

Because of the budget reduction to WRRLCA for 2011-13, WDFW is not receiving any funding for the biennium.

Department of Corrections

The 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 Walla Walla. Table 3.5 summarizes DOC's litter crew activity in 2010.

Table 3.5
Department of Corrections Litter Removal Activity
January 1 – December 31, 2010

Total Hours Worked (Supervisor + Crew)	47,666
Total Pounds Collected (Litter + Illegal Dump + Recycled)	836182
Miles	2 ,710
Acres	672
Number of Illegal Dumps Cleaned	9

DOC will receive the same funding for 2011-13.

Department of Natural Resources

The 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 2009-11 Biennium, DNR's litter funding was reduced by $105,000 to $415,000. Table 3.6 summarizes DNR crew activity in 2010.

Table 3.6
Department of Natural Resources Litter Removal Activity
January 1 – December 31, 2010

Total Hours Worked (Supervisor + Crew)	26,871
Total Pounds Collected (Litter + Illegal Dump + Recycled)	290,953
Miles	1,212
Acres	203
Number of Illegal Dumps Cleaned	741

Because of the budget reduction to WRRLCA for 2011-13, the DNR's funding was reduced to $320,000.

Department of Transportation

The 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 2010, WSDOT crews removed and disposed of 3,621 tons of litter from state roadways (roughly seven million pounds).

Because of the budget reduction to WRRLCA for 2011-13, WSDOT will not receive any funding for the biennium.

Looking Ahead

The 2011-13 Biennium is as challenging as it was in 2009-11. Coordination of the 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 Beyond Waste, the state's solid and hazardous waste plan. Recognizing we will continue to generate many wastes, the Beyond Waste Plan also calls for valuing these materials as resources, and moving them into closed-loop recycling systems or diverting them for other uses instead of disposing of them.

To measure progress, a record of the amount and types of waste generated is essential. To determine the amount of waste generated in Washington State, Ecology uses the amount of materials disposed each year, plus the amount of materials recycled and diverted from disposal. The way we calculate this number has changed 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. Recent drops from 2006-09 may indicate we are on our way to improving this trend. The recent recession may have played a part in reducing our waste generation as well.

Washington State's population has continued to grow since Ecology began to track disposal and recycling. Population growth rates in Washington have averaged 1.8 percent per year from 1988 to 2010, with the total population increasing more than 2.3 million during that period.[1]

With an increase in population often comes an increase in waste generation, and this has certainly been true in Washington. However, the amount of waste disposed of, as well as the amount recycled and diverted, has increased faster than the population, resulting in an increase in waste generation in the last decade (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 four percent. The total amount of waste generated annually since 1994 has increased by more than nine million tons.

Since we began measuring disposed solid wastes back in 1994, Washington citizens have generated more than 210 million tons of solid waste. This is roughly equal to about 84 percent of the total solid waste generated in the United States in 2010, and weighs about the same as disposing of 105 million cars in a landfill.[2]

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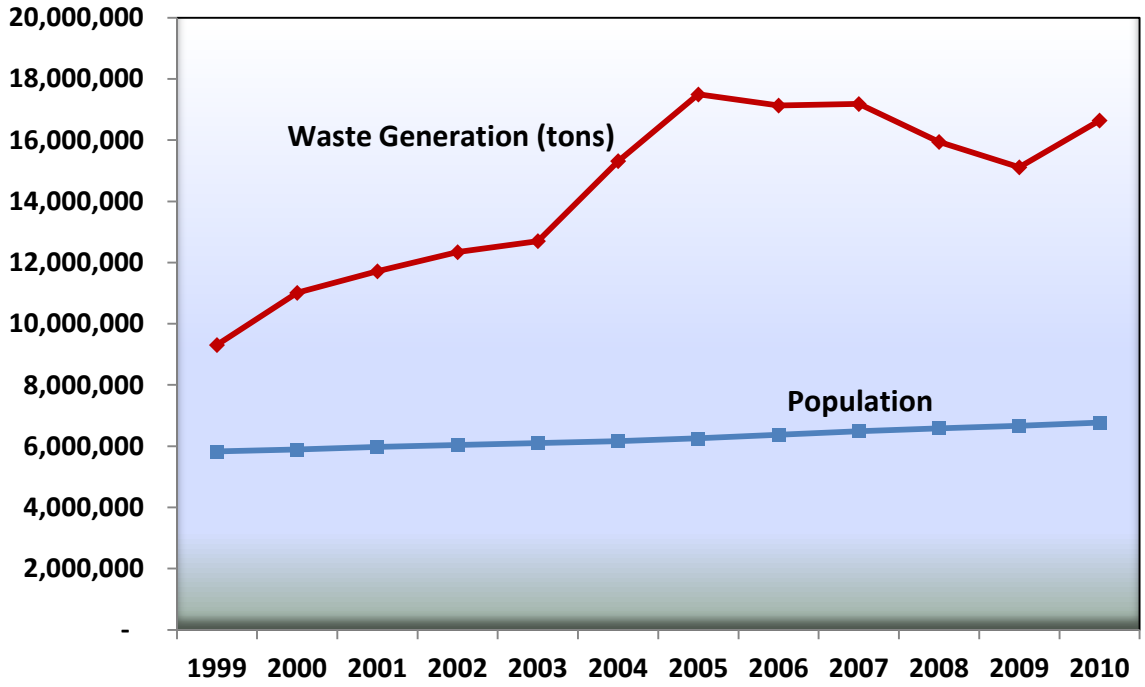
[1] Population figures from Office of Financial Management at http://www.ofm.wa.gov/

[2] U.S. Environmental Protection Agency: http://www.epa.gov/otaq/cert/mpg/fetrends/420r10023.pdf.

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 we dispose of in landfills and incinerators are considered part of our "waste." However, materials we separate from disposal for recycling, or some other useful activities other than disposal 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 these materials will be put toward 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.

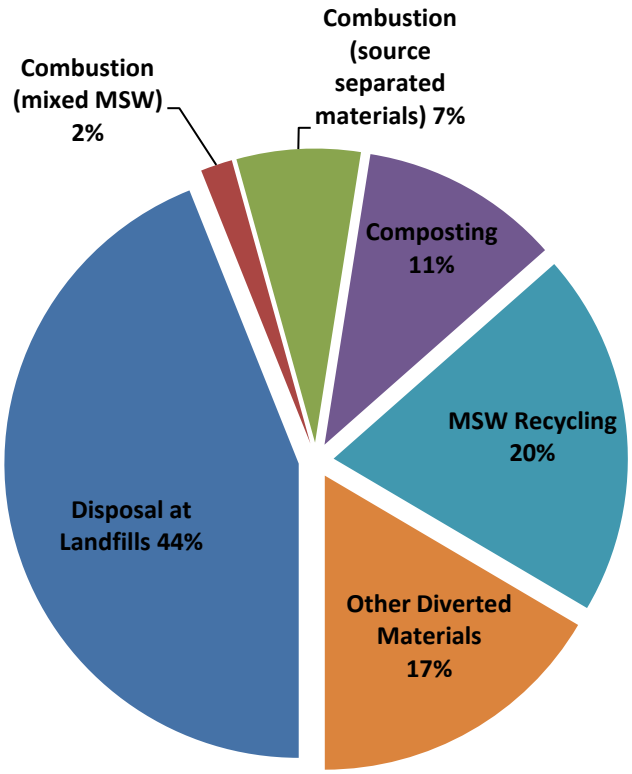
4. Composting in regulated facilities.

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 2010.

Figure 4.2
Waste Management Methods 2010



Some material types have one unique final use, such as aluminum cans that are recycled back into more aluminum cans rather than composted or burned for energy. 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. As recyclers develop systems to track this type of information, data quality is improving.

The largest measured part of Washington's waste generation number is the disposed waste stream. This number has increased over the long-term, but decreased in recent years. The overall long-term increase could be occurring for several reasons. In some cases, we are simply throwing away more. In addition, because of reporting requirements in *Chapter 173-350 WAC*,

Solid Waste Handling Standards, we are getting more details from facility annual reports on wastes we dispose of. We are also getting information on waste disposed of in other states (for example, waste tires generated in Washington that are disposed in Oregon and some other states).

We 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.

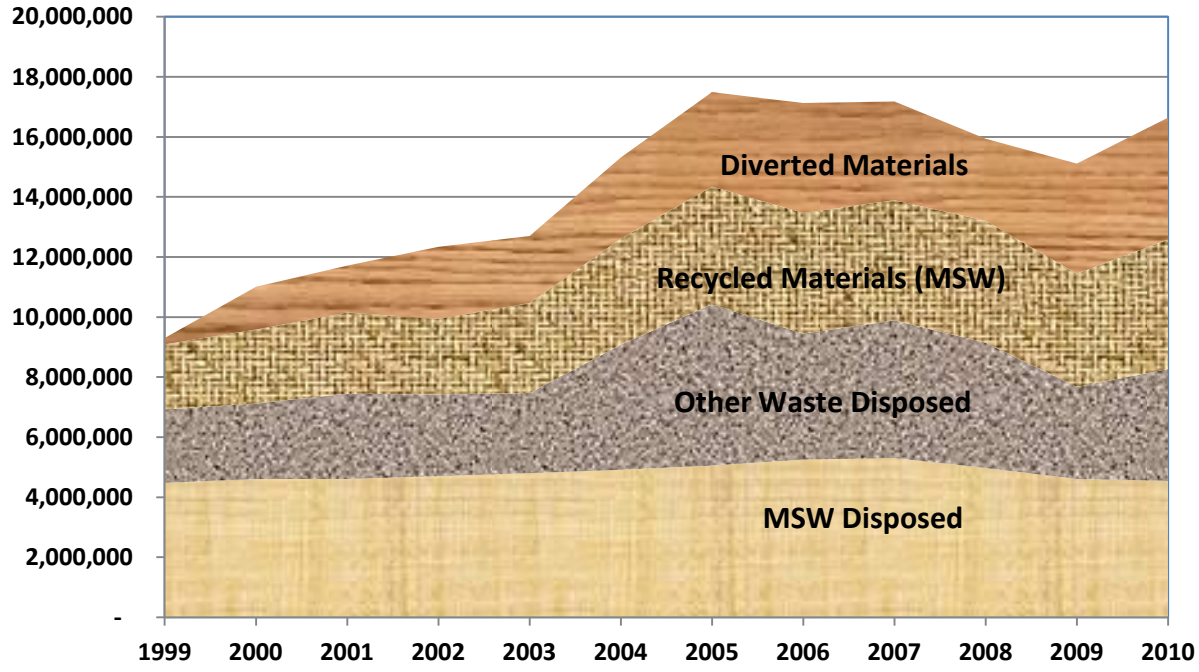
The other measured part of Washington's waste generation number is comprised of materials recycled and diverted from disposal. The reported list of materials included as recycling and diversion has increased over time. Since 1986, Ecology has largely followed the guidance of the Environmental Protection Agency 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 continue to increase our efforts to get better reporting from recyclers and those who divert waste from disposal. Due to Ecology tracking additional materials, 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, and then increased to 16,643,568 tons in 2010.

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 *Municipal Solid Waste Recycling* 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. Municipal solid waste (MSW) or materials in the first category are sometimes called "traditional" recycling. Materials in the second category diverted from disposal, combined with the "traditional" materials, make up the "diversion" rate.

Per capita numbers from for the municipal solid waste stream are shown in Table 4.1. Residents and businesses in the state generated 7.17 pounds MSW per person per day in 2010; 3.68 pounds were disposed and 3.49 pounds were recovered for recycling. For per capita MSW numbers for 1986 – 2010, 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	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
MSW Disposed	4.23	4.27	4.32	4.37	4.43	4.52	4.48	4.14	3.79	3.68
MSW Recycled	2.48	2.28	2.69	3.14	3.43	3.46	3.38	3.38	3.10	3.49
MSW Generated	6.71	6.55	7.01	7.51	7.86	7.97	7.86	7.52	6.89	7.17

Municipal solid waste 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, and recycled and diverted materials. The result is a much higher generation number for the state – 13.48 pounds per person per day, with 6.78 pounds recycled/diverted and 6.70 pounds disposed (Table 4.2).

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

Per Capita Solid Waste	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Disposed[3]	6.83	6.74	6.71	8.07	9.14	8.12	8.36	7.64	6.31	6.70
Recycled/ Diverted	3.91	4.46	4.70	5.54	6.18	6.60	6.16	5.65	6.11	6.78
Generated	10.75	11.19	11.41	13.61	15.32	14.72	14.51	13.29	12.42	13.48

The total waste generation numbers include all waste – household, business, 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, and therefore they should be disposed in a landfill.

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

Much of the total waste stream is wastes that could be recycled or reused, or just not created in the first place. These are wastes we need to focus prevention and reduction efforts on as described in the state's Beyond Waste Plan. 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.

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 from three municipal solid waste landfills in Oregon (Finley Butte, Wasco, and Columbia Ridge) that receive waste from Washington State.

In 2010, a total of 8,272,583 tons were disposed. Table 4.3 shows the amounts and general types of waste disposed of since 1998 by Washington citizens[4]. Spreadsheets identifying the disposal location, type and amount of waste for each county for 1994 - 2010 are at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[4] "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	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
MSW/ Commercial	4,276,276	4,480,761	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
Demolition	529,515	530,417	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
Industrial	208,398	325,135	157,634	563,249	546,299	743,042	1,356,415	1,092,305	512,277	530,835	361,017	277,691	446,521
Inert	107,452	23,875	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
Wood	89,142	158,022	197,929	246,754	91,697	90,303	89,905	61,918	52,833	40,579	39,926	29,449	8,822
ASH (other than SIA)	N/A	N/A	N/A	N/A	N/A	N/A	536,651	420,222	148,545	88,093	76,943	129,072	189,626
Sludge	65,440	62,919	95,050	1,473	1,762	22,835	10,171	12,458	33,490	30,432	35,682	16,550	1,985
Asbestos	13,044	12,961	11,777	10,929	11,177	15,455	18,252	21,951	29,700	103,686	11,914	12,654	12,683
Petroleum Contaminated Soils	198,082	372,734	284,778	616,725	784,703	568,681	489,385	957,788	740,341	735,773	1,057,069	786,762	766,381
Other Contaminated Soils	N/A	N/A	N/A	N/A	N/A	N/A	146,554	231,428	225,488	321,762	125,440	327,918	448,486
Tires[5]	12,129	10,362	40,908	7,752	4,919	22,226	15,212	22,446	33,698	50,704	25,541	28,834	23,275
Medical	7,704	5,474	6,349	5,255	2,417	2,498	2,624	2,651	2,899	3,998	3,013	2,983	11,618
Other	41,866	28,450	178,156	198,259	124,512	270,992	196,793	197,010	256,627	189,316	250,656	226,601	210,758
Total[6]	**5,549,048**	**5,537,142**	**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**

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

In 2010, there was an overall increase in the amount of waste disposed. There were increases in inert, ash other than special incinerator ash, and contaminated soils. Municipal/commercial, demolition and wood categories amounts decreased. 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.

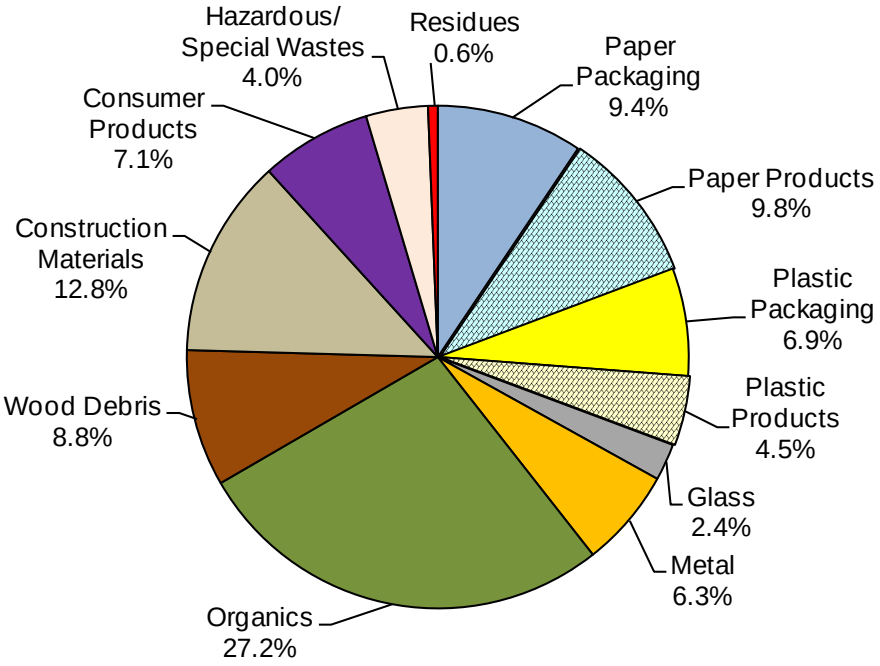
Ecology commissioned Cascadia Consulting Group (Cascadia) to conduct a four-season municipal solid waste (MSW) characterization study during 2009-10. The purpose of this study was to support Ecology's Beyond Waste Initiative and conduct an in-depth examination of materials and resources currently disposed throughout the state.

Ecology can use the data collected in this study to help municipalities, as well as public and private solid waste managers to design targeted recycling and diversion programs. These programs will move beyond material disposal to resource conservation and ultimately to a healthier environment.

Figure 4.4 shows the composition estimates by Material Class for the overall waste stream. The study reveals that organic materials make up the largest percentage of the overall statewide disposed waste stream composition, at 27.2 percent. Construction materials follow, with 12.8 percent of the overall waste stream, then paper products at 9.8 percent. Food scraps make up 18.3 percent of the overall waste stream, making it the largest single material disposed in landfills.

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.

Figure 4.4
Overall Statewide Disposed Waste Stream Composition by Material Class, 2009



As we move forward to implement the Beyond Waste Plan, specific information on the contents of our waste will be essential to understand the makeup of the solid waste stream. This will help us focus efforts to eliminate and reduce specific types of wastes or materials, and allow us 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, more "traditional" recycling, disposal and generation measures that include *only the municipal solid waste (MSW) stream.*

In 1989, the 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 set by the Legislature refers to the MSW recycling rate. To determine this rate and ensure it is consistent and comparable with past years, Ecology has measured a very 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.[7]

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. These efforts ranged from drop boxes to curbside collection of a variety of recyclable materials. Despite all 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 forward the 50 percent goal to 2007, but the state did not attain the 2007 goal. Legislators also set a state goal to establish programs to eliminate yard waste in landfills by 2012.

In 1999, Ecology began to expand what it measures to include materials outside of the state's definition of municipal recycling with the "solid waste diversion" measure. Ecology continues to measure progress on MSW recycling, since this is an important area for municipal governments and industry assessing progress on programs intended to change the disposal practices of residents and businesses.

Although Washington did not achieve the goals established by the Legislature in the intended period, Washington's recycling rate is increasing as infrastructure and markets develop. In 2010, there were 174 cities and unincorporated county areas offering curbside collection of recyclable materials such as paper, plastic and metals. This was an increase from 169 in 2009. At the same time, 136 cities and county unincorporated areas offered curbside collection of yard waste, which was an increase from 132 in 2009. 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 2009.

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

Each year since 1986, Ecology has conducted a survey 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[8] of the waste stream.

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[7] 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.

[8] 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

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 - 2010.

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%

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 of increased enough to drop the recycling rate to 33 percent.

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.

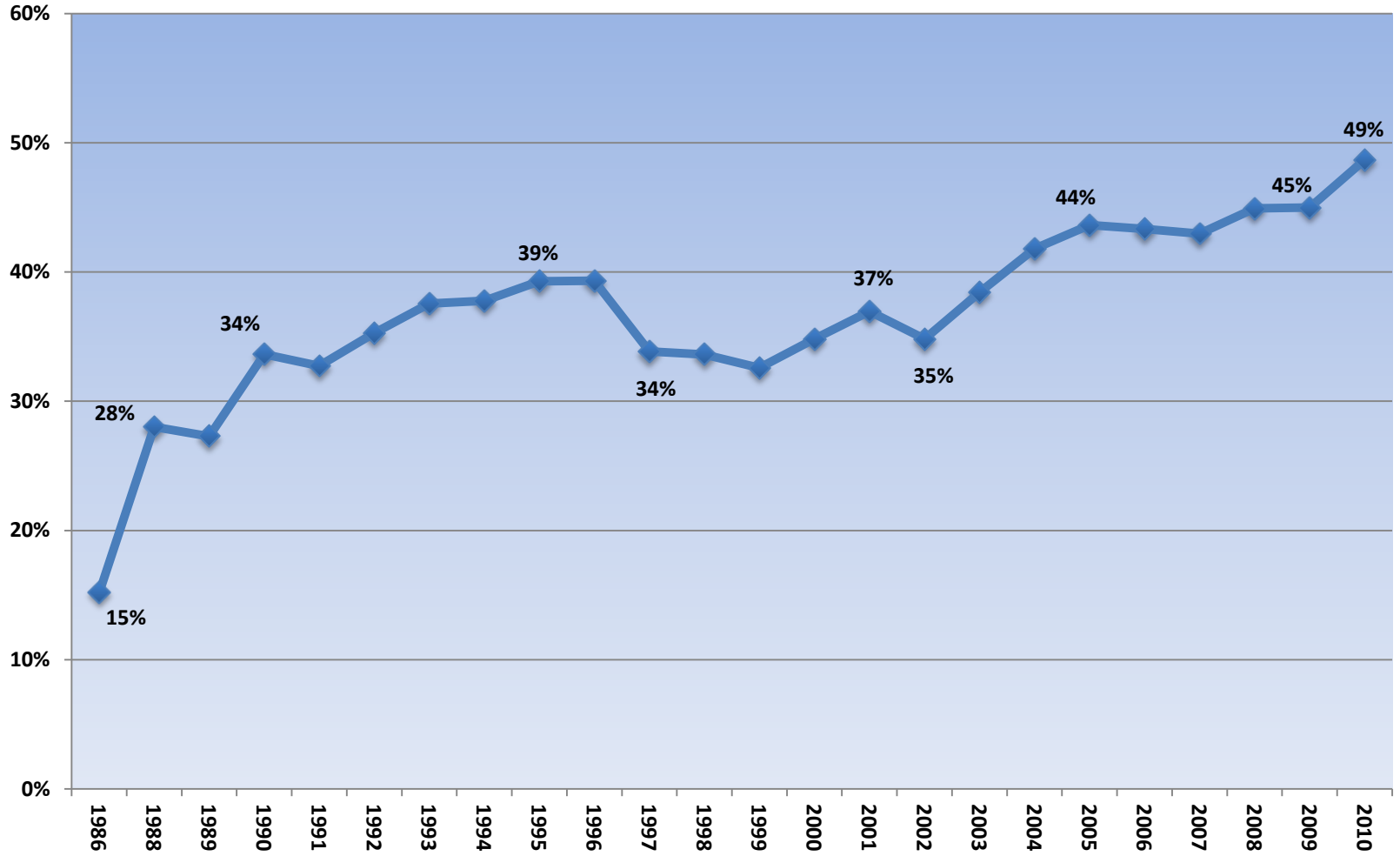
In 2003, the reporting requirements for recycling facilities changed with *Chapter 173-350 WAC, Solid Waste Handling Standards.* These changes resulted in better reporting of recyclables. In addition, the market demand for ferrous and nonferrous metals was high during 2003, which helped to bring the 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 continued at that rate in 2007. The economic recession that began around 2008 brought a reduced disposal rate, and boosted the recycling rate to a high of 45 percent in 2008, where it remained in 2009. In 2010, MSW disposal continued to decrease, and with recycling increasing this brought the recycling rate up to an all-time high of 49 percent (see Figure 4.5). 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.

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.

Figure 4.5
Washington State MSW Recycling Rate - 1986 to 2010



As of 2011, about 86 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 1998. Ecology believes newcomers, as well as longtime residents, need ongoing education and advertising to learn to recycle or to continue to do so.

Many curbside programs in the state are changing to commingled or single-stream (mixed) collection systems in an effort 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 2010. 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 are collecting about 10 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 report by Ecology in June 2010 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 may be 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 the recycling activity in the state each year and report the results. From 1986 until 2002, tools to measure recycling activity in Washington included only 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*. The annual reports for facilities are mandatory. Facilities could receive a penalty for failing to submit an annual report.

Ecology sends the survey and annual reporting forms to recycling facilities, other firms involved in recycling (such as brokers), haulers and local governments. They reply with information about the types and quantities of recyclable materials they collected. Though the recycling survey portion of the measurement tool *is* mandatory, there is no penalty for not returning the

information and some firms do not respond. Some firms respond with estimates of the amount and origin of materials. These factors offer challenges to compiling good county-specific recycling and diversion information.

This situation also creates the need for intensive cross-checking of data. This is done through phone and e-mail correspondence with the end-users of recyclable materials, recycling facilities, other intermediate collectors of recyclables and local governments. Ecology develops aggregate figures for each commodity and compares them to the reports collected. The data is also cross-checked with past years' aggregate data, county data, and individual company data.

Ecology bases the reliability of the results on review of draft numbers sent to local governments, and comparisons to waste characterization, disposal data and commodity end-user information. Companies reporting on the recycling survey may just report tonnage they collected directly from generators. However, facilities responding to annual reports need to submit tonnage information for all materials handled at their facility. Also, county recycling coordinators and solid waste managers are asked to review the figures.

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 representative to the extent possible.

Both the recycling survey forms 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 – 2010 MSW Recycling

So we can consistently compare results from year to year, Ecology includes much 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 2007-10.

Table 4.5
MSW Recycled Tonnage Reported
MSW Recycling Rates[9] 2007-10

Recycled Materials Reported (MSW)	2007	2008	2009	2010
Aluminum Cans	14,005	12,842	21,098	13,655
Appliances/White Goods	44,667	43,401	39,777	48,881
Batteries – Auto Lead Acid	25,734	25,219	21,493	26,986
Cardboard	555,757	569,688	491,266	471,477
Cartons	5,787	5,475	5,526	2,763
Container Glass	96,934	94,077	100,823	109,916
Electronics	12,325	17,265	22,190	25,569
Fats and Oils	116,964	124,289	92,345	91,050
Ferrous Metals	1,009,826	1,013,552	998,721	1,332,254
Fluorescent Light Bulbs	979	1,600	1,229	1,087
Food Scraps (post-consumer)	50,304	48,664	77,699	62,041
Gypsum	52,767	86,603	38,662	30,882
HDPE Plastics	11,348	7,742	13,876	18,824
High-Grade Paper	82,806	57,929	47,266	76,667
LDPE Plastics	13,695	14,040	15,407	16,772
Mixed Paper	361,043	367,834	274,982	287,814
Newspaper	289,250	282,981	267,524	233,924
Nonferrous Metals	115,718	94,340	142,931	123,680
Other Recyclable Plastics	12,350	11,245	12,524	13,009
PET Plastic Bottles	14,024	9,827	16,767	15,803
Photographic Films	429	442	354	433
Rubber Materials	50	6	8	10
Steel Cans	22,315	10,526	17,293	15,060
Textiles (rags, clothing, etc.)	65,286	19,946	16,445	24,976
Tires (recycled)	27,869	40,124	35,439	26,775
Used Oil	86,174	78,443	110,038	71,725
Wood Waste	228,146	381,866	200,980	347,137
Yard Debris	684,181	641,130	689,849	537,442
Yard Debris and Food (mixed)	n/a	n/a	n/a	285,965
Total MSW Recycled	**4,000,733**	**4,061,094**	**3,772,509**	**4,312,581**
Total MSW Disposed[10]	**5,309,296**	**4,978,496**	**4,613,329**	**4,548,275**
Total MSW Generated	**9,310,029**	**9,039,590**	**8,385,838**	**8,860,856**
MSW Recycling Rate	**42.97%**	**44.93%**	**44.99%**	**48.67%**

[9] Detail may not add due to rounding.

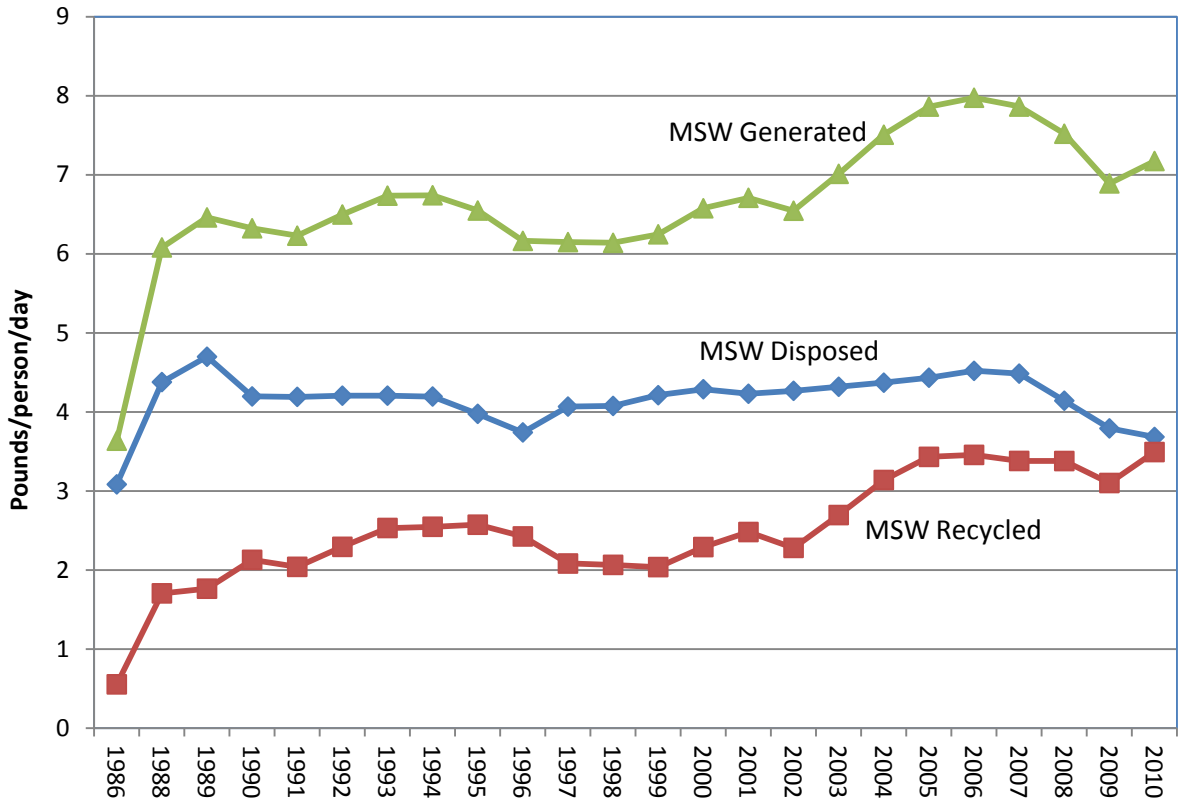
[10] The amount of MSW disposed represents only the quantity defined "recyclable portion" of the waste stream from municipal and commercial sources. It excludes the following waste types reported from landfills and incinerators: demolition, industrial, inert, wood, ash, sludge, asbestos, contaminated 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 his or her household, school, workplace and anywhere else solid waste is produced. The figures below present only an average of the total contributions of all residents. Some people may actually contribute much more or less waste than others. However, the picture tends to be more tangible when described in individual or "per person" terms. Figure 4.6 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 2010, each resident of the state generated 7.17 pounds of municipal solid waste per day, disposing 3.68 pounds per person; 3.49 pounds per person was 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 decreased, with a slight increase from 2009 to 2010 (see Table 4.6).

Figure 4.6
Pounds of MSW Disposed, Recycled
& Generated Per Person/Day
1986 - 2010



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[11]
2000-2010

MSW Per Capita	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Disposed	4.29	4.23	4.27	4.32	4.37	4.43	4.52	4.48	4.14	3.79	3.68
Recycled	2.29	2.48	2.28	2.69	3.14	3.43	3.46	3.38	3.38	3.10	3.49
Generated	6.58	6.71	6.55	7.01	7.51	7.86	7.97	7.86	7.52	6.89	7.17

[11] 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 determined a consistent recycling rate that is comparable to past years by measuring the part of the waste stream known as MSW. However, 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 termed "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 from the recycling and diversion facilities the number of tons of material diverted from landfills. In the past, 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 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).[12] Washington shows a diversion rate of 54 percent in 2010 (Table 4.7).

Table 4.7
Diversion Rates
1999 - 2010

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%

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 the recycling facility to report the final use of the material

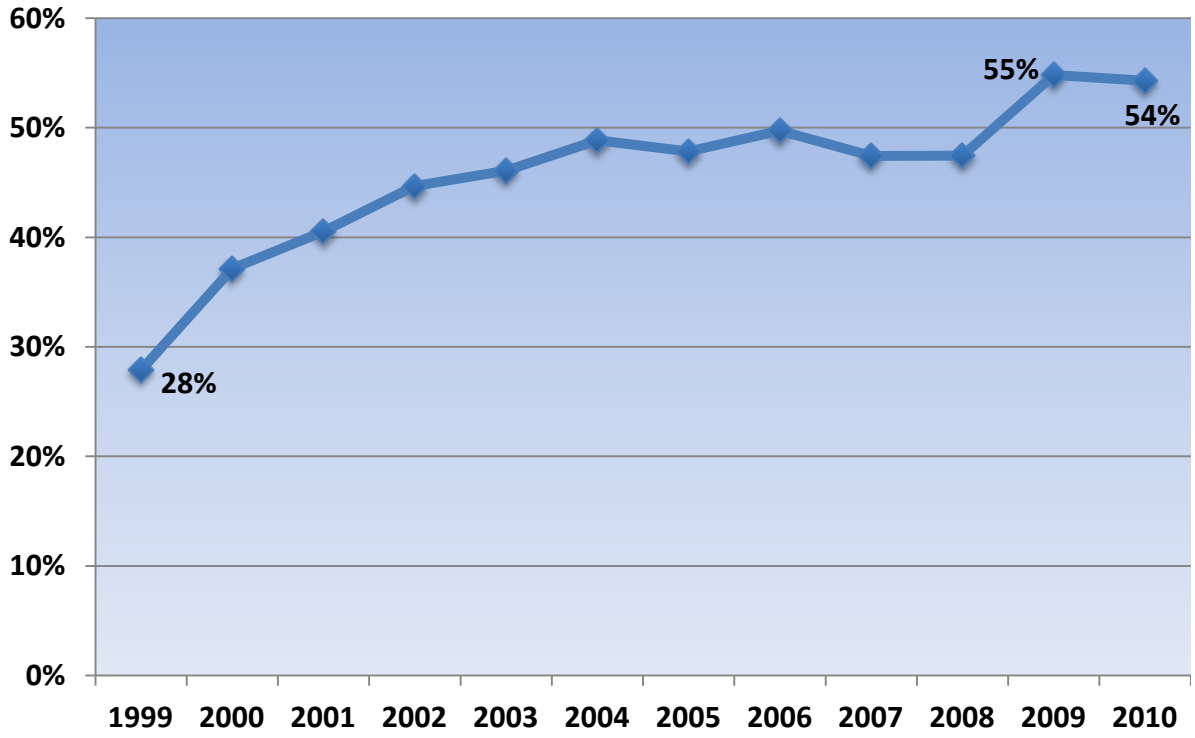
[12] Waste types used to calculate diversion include municipal, demolition, inert, industrial, wood, tires, medical and other. Excludes asbestos, sludge and contaminated soils.

(recycled, composted, burned for energy), the facility 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 being 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 4.7 shows the diversion rate in Washington since Ecology began measuring it in 1999.

Figure 4.7
Washington State Diversion Rates – 1999 to 2010[13]



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 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.

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

Measurement Methodology

See the above section for a complete discussion of measurement methodology as it pertains to recycling and diversion.

Results – 2010 Diversion

Diversion is the term used to measure more materials than just 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 2007-10.

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

Diverted & Recycled Materials Reported	2007	2008	2009	2010
Agricultural Organics[14]	-	31,800	45,431	55,689
Aluminum Cans	14,005	12,842	21,098	13,655
Antifreeze	7,055	6,586	5,194	4,783
Appliances/White Goods	44,667	43,401	39,777	48,881
Ash, Sand & Dust used in Asphalt Production	2,521	-	344	20,364
Asphalt & Concrete	2,089,972	1,510,051	2,186,429	2,188,200
Batteries – Auto Lead Acid	25,734	25,219	21,493	26,986
Cardboard	555,757	569,688	491,266	471,477
Carpet and Pad	1,193	3,297	3,317	3,867
Cartons	5,787	5,475	5,526	2,763
Construction & Demolition Debris	302,089	339,066	302,836	269,603
Container Glass	96,934	94,077	100,823	109,916
Container Glass (used as aggregate)	-	-	-	3,212
Electronics	12,325	17,265	22,190	25,569
Fats and Oils[15]	-	124,289	92,345	91,050
Ferrous Metals	1,009,826	1,013,552	998,721	1,332,254
Fluorescent Light Bulbs	979	1,600	1,229	1,087
Food (recovered)	-	-	-	402
Food Processing Wastes (pre-consumer)	-	3,494	14,027	27,762
Food Scraps (post-consumer)[16]	167,268	48,664	77,699	62,041
Gypsum	52,767	86,603	38,662	30,882
HDPE Plastics	11,348	7,742	13,876	18,824
High-Grade Paper	82,806	57,929	47,266	76,667
Household Batteries	1,755	2,270	535	458
Industrial Batteries	-	-	99	1
Industrial Organics[17]	-	45,586	85,692	83,681
Industrial Paper	-	-	-	6,476
Land Clearing Debris	168,007	169,428	162,939	150,287
Land Clearing Debris for Energy Recovery	136,205	141,406	78,018	130,766
LDPE Plastics	13,695	14,040	15,407	16,772
Miscellaneous	-	-	13	57
Mixed Paper	361,043	367,834	274,982	287,814

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

Diverted & Recycled Materials Reported	2007	2008	2009	2010
Newspaper	289,250	282,981	267,524	233,924
Nonferrous Metals	115,718	94,340	142,931	123,680
Oil Filters	2,635	2,639	2,535	1,775
Other Fuels (Reuse & Energy Recovery)	.25	-	-	5
Other Organics[18]	149,492	86,191	47,430	145,251
Other Recyclable Plastics	12,350	11,245	12,524	13,009
Paint (Reused)	344	928	552	207
PET Plastics	14,024	9,827	16,767	15,803
Photographic Films	429	442	354	433
Post-Industrial & Flat Glass	1,706	-	1,750	2,390
Post-Industrial Plastics	-	-	223	-
Reuse (Clothing & Household)	4,346	2,678	22,001	6,164
Reuse (Construction & Demolition)	1,374	-	151	8,360
Reuse (Miscellaneous)	286	105	4,148	5,036
Roofing Material	10,188	10,205	10,872	14,518
Rubber Materials	50	6	8	10
Steel Cans	22,315	10,526	17,293	15,060
Textiles (Rags, Clothing, etc.)	65,286	19,946	16,445	24,976
Tires (Baled)	9,660	5,912	9,672	-
Tires (Burned for Energy)	16,735	8,440	10,725	18,121
Tires (Recycled)	27,869	40,124	35,439	26,775
Tires (Retread/Reuse)	4,764	3,829	6,164	10,834
Used Oil	86,174	78,443	110,038	71,725
Used Oil for Energy Recovery	129	33	177	2,568
Wood Waste	228,146	381,866	200,980	347,137
Wood Waste for Energy Recovery	353,683	331,528	613,888	847,115
Yard Debris	684,181	641,130	689,849	537,442
Yard Debris and Food (mixed)	-	-	-	285,965
Yard Debris for Energy Recovery	25,069	26,029	49,994	50,452
Total Diverted + Recycled Materials	**7,289,943**	**6,792,597**	**7,437,668**	**8,370,985**
Total Waste Disposed[19]	**8,082,291**	**7,516,909**	**6,126,660**	**7,043,048**
Total Waste Generated	**15,372,234**	**14,309,506**	**13,564,327**	**15,414,033**
Diversion Rate	**47.42%**	**47.47%**	**54.83%**	**54.31%**

[18] Prior to 2008, includes Agricultural Organics and Industrial Organics.

[19] For purposes of calculating a diversion rate, this analysis includes only the wastes that are potentially recyclable. Waste types used in this calculation include MSW, demolition, inert, wood, tires, medical waste and other unclassified wastes. It excludes industrial wastes, asbestos, sludge and contaminated soils.

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 required 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 2010 reduced greenhouse gas emissions by about 3.1 million tons (MTCE) or 916 pounds per person. The 8.4 million tons of material diverted from disposal in Washington in 2010 saved more than 160 trillion British thermal units of energy. This is similar to conserving 1.3 billion gallons of gasoline – enough to power 1.5 million homes for a year (over half the households in Washington). [20]

[20] 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.doe.gov/emeu/states/_seds_updates.html.

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, 6,868,354 tons of waste were disposed in all types of landfills and incinerators in Washington in 2010 (Table 4.9). For total solid waste disposed from 1993 – 2010, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.9
Total Amounts of Solid Waste Disposed in Washington

Disposal Method	2002	2003	2004	2005	2006	2007	2008	2009	2010
Municipal Solid Waste Landfills	4,744,561	4,572,275	5,506,112	5,517,342	5,398,008	5,354,005	5,157,547	4,775,888	4,875,010
Incinerated Waste	311,474	303,978	327,837	335,533	326,584	312,006	297,832	277,101	288,208
Woodwaste Landfills[21]	33,171	34,188	*	*	*	*	*	*	*
Inert / Demolition Landfills	476,917	476,214	509,927	1,531,642	1,231,565	1,708,445	1,261,131	693,349	966,184
Limited Purpose Landfills	605,284	586,670	1,075,102	1,387,934	760,088	600,928	623,063	624,575	738,952
Total	**6,171,407**	**5,973,325**	**7,418,978**	**8,772,451**	**7,716,245**	**7,975,444**	**7,339,573**	**6,370,913**	**6,868,354**

Municipal Solid Waste Landfills

Amount of Waste Disposed of in Municipal Solid Waste Landfills

In 2010, 15 municipal solid waste landfills accepted waste totaling 4,875,010 tons.[22] Of the 15 landfills, 12 were publicly owned and 3 privately owned.

Five of the 15 landfills received over 100,000 tons of waste in 2010. The three largest landfills in Washington are Cedar Hills in King County (830,882 tons), LRI – 304th Street in Pierce County (1,066,193 tons), and Roosevelt Regional Landfill in Klickitat County (2,066,267 tons).

In 2010, one landfill received less than 10,000 tons, Northside Landfill in Spokane County, compared with 12 MSW landfills receiving less than 10,000 tons in 1994.

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

[22] 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.

Figure 4.8 shows that several smaller and a few mid-sized landfills closed between 1995 and 1996 in response to more stringent regulations for MSW landfills (*Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills*). Other landfills are reaching their remaining capacity and not planning to expand. There has been a gradual decrease in the number of landfills since 1996. There are only 15 operating municipal solid waste landfills in the state.

Figure 4.8
Number of MSW Landfills
(Based on Tons Disposed)

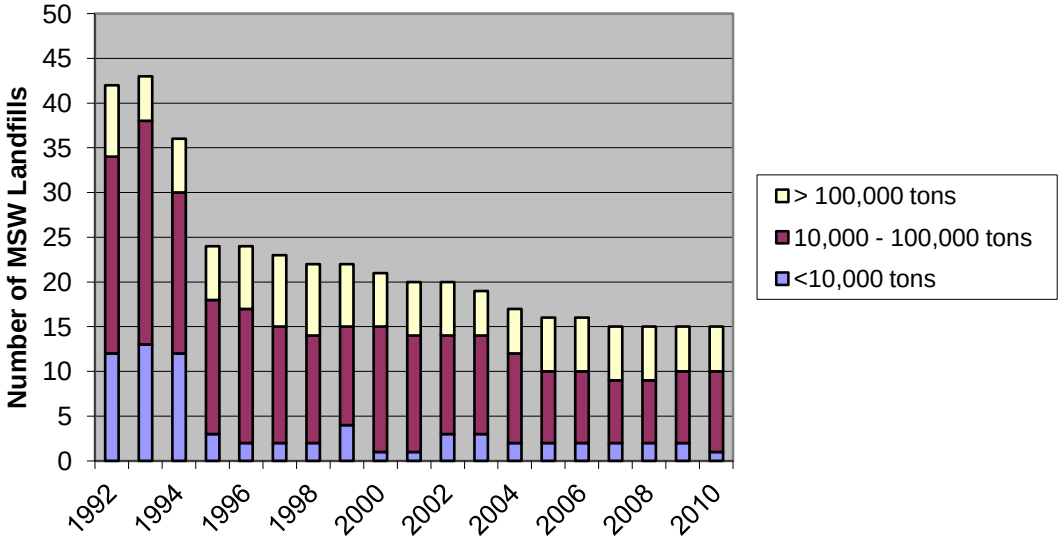


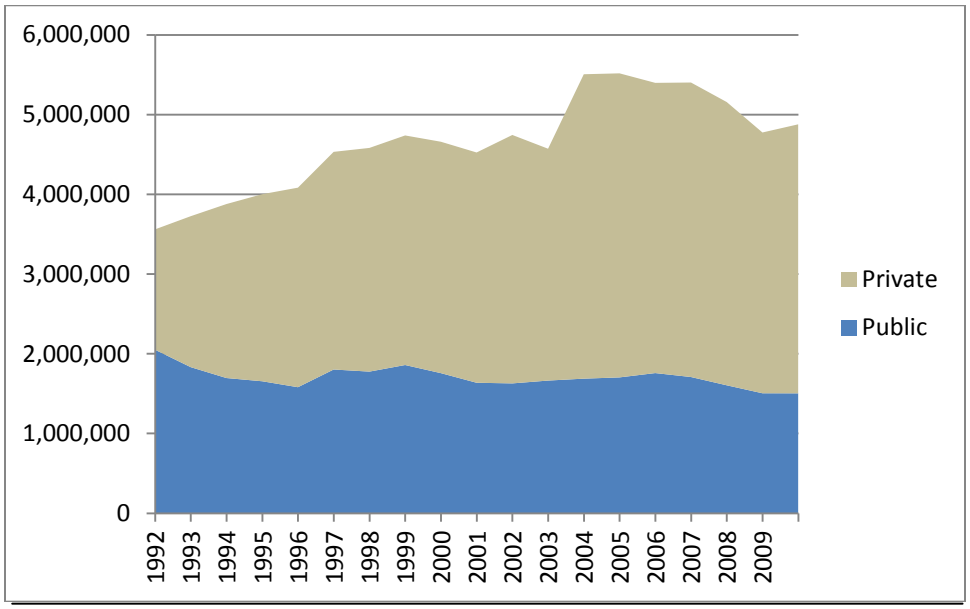
Table 4.10 shows the relationship of waste disposal to public/private ownership. As the table illustrates, 1,504,430 tons of solid waste disposed went to publicly owned facilities (31 percent), with the remaining 3,373,811 tons going to private facilities (69 percent).

Table 4.10
Waste Disposed in MSW Landfills – Public/Private

Ownership	Number of MSW Landfills		Amount of Waste Disposed (Tons)		% Total Waste Disposed	
	1991	2010	1991	2010	1991	2010
Public	36	12	2,696,885	1,504,430	69	31
Private	9	3	1,192,207	3,373,811	31	69
Total	**45**	**15**	**3,889,092**	**4,878,241**	**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 4.9). The trend has continued since 1991, when the state first started to track this type of information. The amount of waste disposed in the private facilities has increased from 31 percent since 1991 to 69 percent in 2010. The private Roosevelt Regional Landfill in Klickitat County and LRI 304th Street Landfill in Pierce County can account for the majority of this increase.

Figure 4.9
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.[23] 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 2010, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[23] "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 shows changes in waste, types and amounts disposed in MSW landfills from 2001-10. MSW landfill data from 1992 – 2010 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

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

Waste Types	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Municipal / Commercial[24]	3,432,359	3,440,727	3,394,428	3,598,760	3,631,873	3,787,080	3,847,352	3,637,010	3,435,505	3,383,984
Demolition Waste	373,254	379,405	324,069	366,087	541,945	551,572	532,409	363,343	260,500	254,453
Industrial Waste	201,198	179,058	212,918	1,034,615	624,958	182,661	131,167	130,929	115,390	164,755
Inert Waste	26,376	17,092	2,635	1,705	15,780	15,842	22,491	11,055	6,387	6,672
Commercial Waste[25]	66,391	99,048	93,036	-	-	-	-	-	-	-
Wood	34,254	55,149	47,622	25,576	9,896	4,462	71	18	424	206
Ash (other than SPI)	-	-	-	3,444	2,857	2,432	3,959	2,102	1,096	1,907
Sewage Sludge	1,473	1,762	23,435	10,172	12,476	21,303	6,703	7,892	15,732	2,455
Asbestos	5,991	4,908	9,625	12,086	7,943	5,633	5,379	4,308	4,975	4,996
Petroleum Contaminated Soils	217,721	457,061	342,172	279,982	320,283	455,964	326,019	693,719	515,567	476,368
Other Contaminated Soils	-	-	-	49,454	212,692	224,608	295,930	119,711	232,673	391,868
Tires	8,567	5,776	9,512	7,462	6,942	8,525	11,797	13,162	8,151	9,750
Special	917	567	-	-	-	-	-	-	-	-
Medical	387	372	2,459	2,565	2,576	2,721	2,805	2,932	2,907	12,109
Other [26]	156,131	103,636	110,364	114,204	127,121	135,206	167,933	171,366	176,581	168,720
Total	**4,525,019**	**4,744,561**	**4,572,275**	**5,506,112**	**5,577,342**	**5,398,008**	**5,354,005**	**5,157,547**	**4,775,887**	**4,878,241**

[24] Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total. In 2004, municipal and commercial categories were combined.
[25] In 2004, the municipal and commercial categories were combined.
[26] Some of the "other" types of waste reported include auto fluff, vactor waste, WWT grit and uncontaminated soils.

Future Capacity at Municipal Solid Waste Landfills

As of September 2011, 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 2011, the facilities estimated about 270 million tons, or about 55 years of capacity at the current disposal rate, an increase from 2010.

Changes in permit conditions, early landfill closures, projections of fewer expansions and changing volumes affect remaining capacity, which has fluctuated the past several years. Of the 15 currently operating landfills, 12 have greater than 5 years of remaining permitted capacity. Some landfills are planning expansions in the future. Table 4.12 includes an estimated number of facilities with specified remaining years of life.

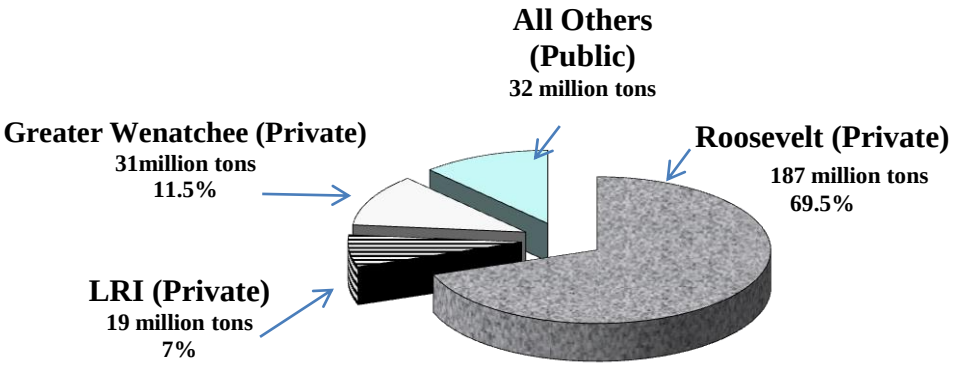
Table 4.12
Estimated Years to Closure for MSW Landfills

Years to Closure	% of total Remaining Capacity	Number of Facilities	Public	Private
Less than 5 years	0.18	3	3	0
5 to 10 years	0.18	1	1	0
Greater than 10 years	99.64	11	8	3
Totals	**100%**	**15**	**12**	**3**

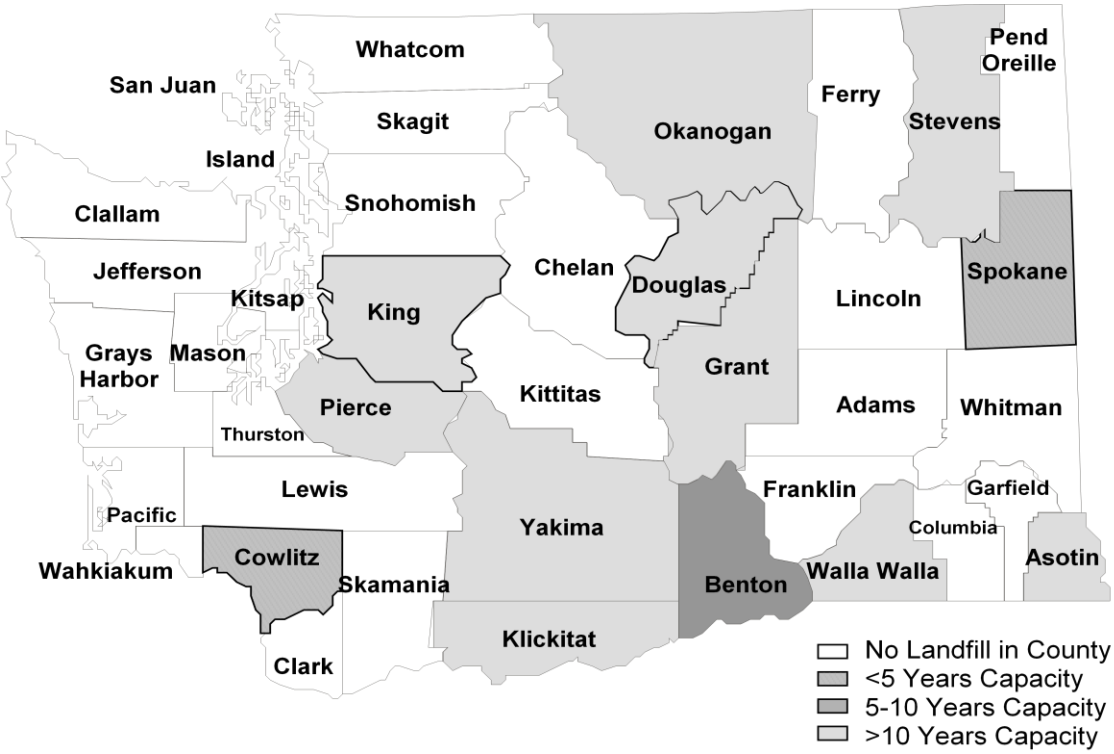
Capacity numbers in 2011 indicated more than 99 percent of remaining capacity was at landfills with more than 10 years before closure. Eleven of the 15 operating MSW landfills are publicly owned, with about 12 percent of the remaining capacity (33 million tons). About 88 percent of the remaining permitted capacity (237 million tons) is at the three privately owned facilities, compared to 73 percent in 1993.

The majority of the capacity, 69.5 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 (11.5 percent) and LRI in Pierce County (7 percent). The 12 publicly owned landfills have 12 percent of the remaining statewide capacity (see Figure 4.10). Map 4.A shows the counties and the remaining years of capacity of their MSW landfills.

Figure 4.10
2010 Remaining Permitted Capacity at MSW Landfills

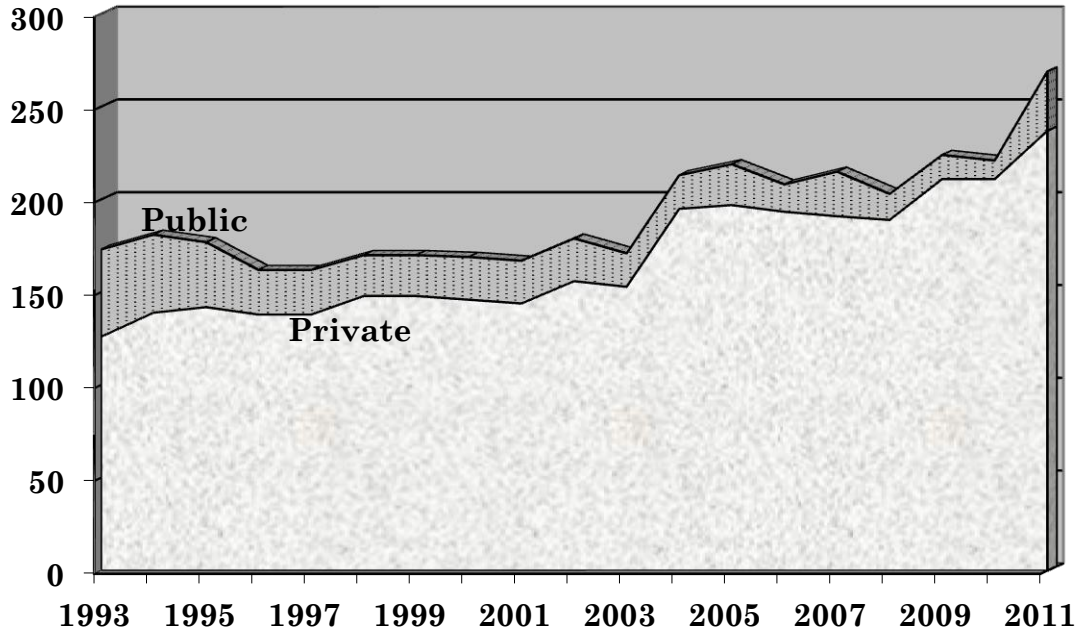


Map 4.A
Remaining Permitted MSW Landfill Capacity as of April 2011



The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992 (Figure 4.11).

Figure 4.11
Remaining Capacity MSW Landfills
(Public/Private in Million Tons)



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.C). In 2010, the facility received some type of solid waste from 26 counties in Washington, including the majority of the solid waste from 14 counties. They also received waste from Alaska, Oregon and British Columbia.

For other counties that do not have landfills, Roosevelt or the Oregon landfills have become the most utilized 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 55-year estimate of total remaining permitted capacity on the amount of waste disposed in MSW landfills in 2010. 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 being imported into the state for disposal or a shift to in-state disposal of waste currently being exported. Cleanup activities, such as dredging contaminated sediments from Puget Sound, will add large volumes to the disposal totals.

Waste-to-Energy/Incineration

Two waste-to-energy facilities and incinerators statewide burned 288,208 tons of solid waste. Of that amount, 17,691 tons were wood waste at the Inland Empire Paper facility in Spokane. [27] This incinerator does not burn MSW. The Spokane Regional Waste to Energy Facility is the only incinerator that burns municipal solid waste in the state. For amounts and types of waste incinerated in 2010 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

MSW Landfill Disposal vs. Incineration

Table 4.13 compares the amount of solid waste disposed in MSW landfills, and waste-to-energy facilities and incinerators in 2010.

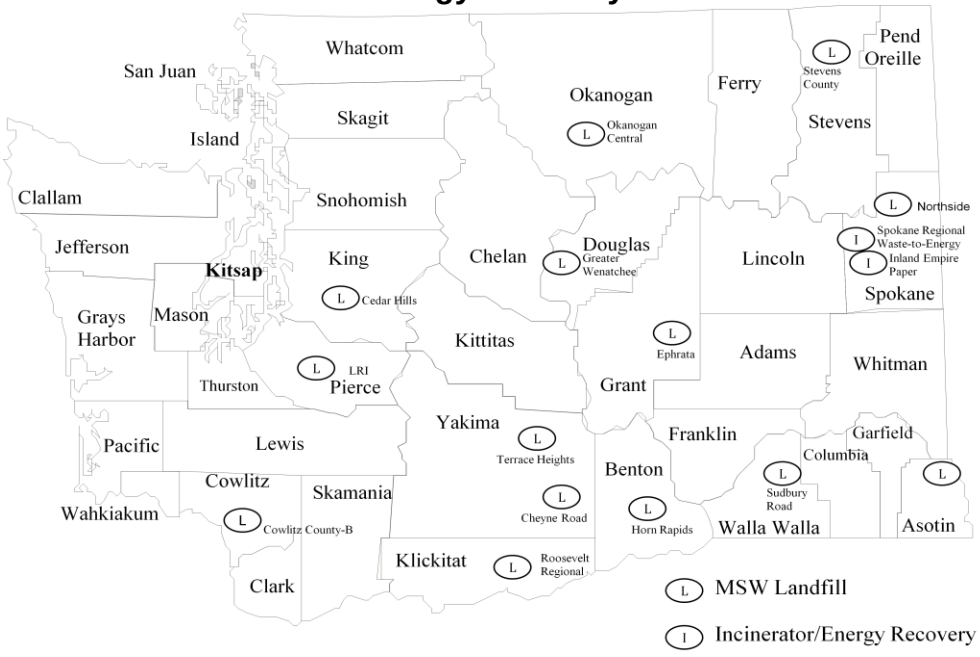
In 1991, 98 percent of waste was disposed in MSW landfills and 2 percent was incinerated. The highest percentage of incinerated waste in the state, 12 percent, occurred in 1995.

Table 4.13
Waste Disposed in MSW Landfills and Incinerators in 2009

Facility Type	Tons	Percent
MSW Landfills	4,878,241	94%
Incinerators	288,208	6%
Total	**5,166,449**	**100%**

In 2010, only about 6 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. Map 4.B shows the location of MSW landfills and energy-recovery facilities in Washington.

Map 4.B
Location of MSW Landfills & Energy Recovery Facilities as of October 2011



[27] The previously reported amounts from the Ponderay Newsprint Company in Pend Oreille County are not included because it is no longer classified as a solid waste incinerator.

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 2010, the Spokane Waste-to-Energy Recovery facility, the only facility of this type in the state, sent 81,759 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 woodwaste landfill and inert/demolition landfill types no longer exist. Inert waste is narrowly defined for disposal in an *inert* landfill. Demolition waste will no longer be accepted at an inert landfill. Landfills accepting demolition or wood waste would 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 4.14. For inert/demolition landfill data from 1992 - 2003 and inert landfill data for 2004-10, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.14
Waste Types and Amounts Disposed at Inert Landfills (in Tons)[28]

Waste Types	2002	2003	2004	2005	2006	2007	2008	2009	2010
Demolition	243,593	95,008	28,967	39,701	89,595	89,457	-	-	-
Industrial	-	81,474	-	-	-	2,150	1,940	799	**945**
Inert	112,457	163,435	379,298	944,153	973,855	1,324,663	1,250,973	604,196	929,578
Wood	445	1,082	2,526	402	610	-	-	-	-
Asbestos	6	11	-	-	-	-	-	-	-
Ash (other than SPI)	-	-	-	7,989	7,497	7,052	7,680	6,320	**5,311**
PCS	120,159	131,872	66,260	215,286	91,399	277,812	-	-	-
Contaminated soils (other)	-	-	-	-	-	-	-	81,074	**28,363**
Tires	257	664	-	-	-	-	-	-	-
Other	-	2,668	33,472	324,110	68,609	7,311	538	960	1,951
Total Tons	**476,917**	**476,214**	**509,927**	**1,531,641**	**1,231,565**	**1,708,445**	**1,261,131**	**693,349**	**966,148**

[28] 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 4.15 shows waste types disposed in Limited Purpose Landfills. For Limited Purpose Landfill data from 1992-2010, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.15
Waste Types and Amounts Disposed at Limited Purpose Landfills (in Tons)

Waste Types	2002	2003	2004	2005	2006	2007	2008	2009	2010
Demolition	98,827	68,946	174,519	220,076	215,543	245,604	255,098	254,824	221,043
Industrial	282,747	325,863	262,560	420,285	257,297	173,992	149,978	113,636	157,960
Inert	195,303	157,431	36,155	53,597	39,928	48,784	100,115	27,335	43,322
Wood	2,747	8,420	32266	21,494	19,629	11,702	18,210	11,608	8,823
Ash (other than SPI)	-	-	533,201	409,376	138,616	77,082	65,117	121,329	180,620
Sludge	-	-	-	-	-	460	460	460	-
Asbestos	1,311	1,302	1,581	1,624	1,420	1,374	1,614	2,313	2,357
PCS	9,888	4,890	20,399	224,064	32,836	20,656	11,398	75,275	96,639
Soils (uncont.)	-	-	-	13,706	29,006	-	-	-	9,327
Tires	59	81	713	690	423	65	35	122	30
Other	14,402	19,737	13,708	23,022	25,390	21,210	21,038	17,673	18,830
Total Tons	**605,284**	**586,670**	**1,075,102**	**1,387,934**	**760,088**	**600,928**	**623,063**	**624,575**	**738,952**

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

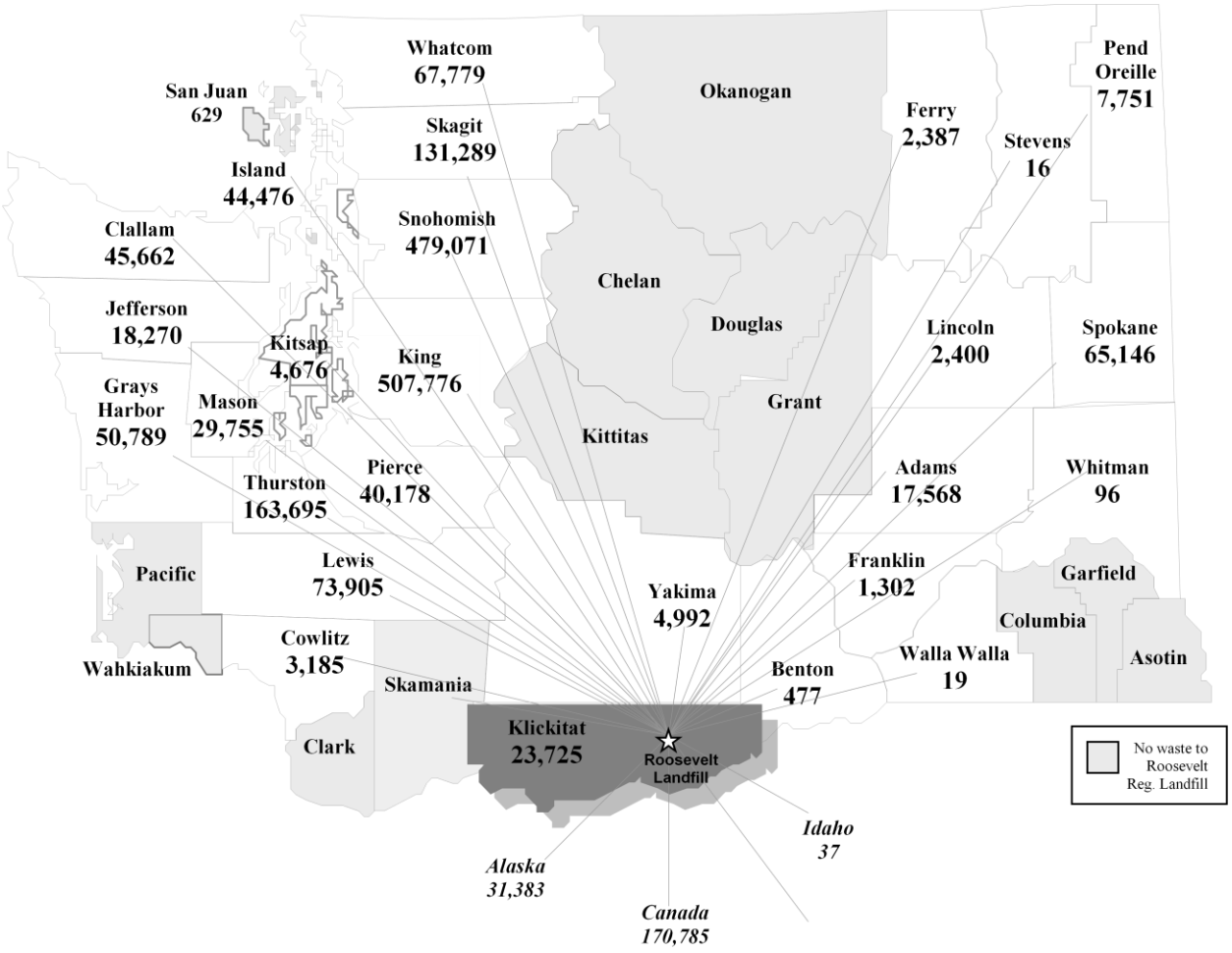
Movement of Waste Between Counties

All landfills and incinerators report the source, types and amounts of waste they receive from out of county. Eight of the 15 active MSW landfills reported receiving solid waste from other counties in 2010.

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 PCS, 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.C).

Map 4.C
2010 Solid Waste to Roosevelt Regional Landfill (in Tons)



For many counties that still have operating MSW landfills, Roosevelt Regional Landfill has become an option to dispose of some of their non-municipal waste, thus saving local landfill capacity for future need. Fourteen of the 26 counties rely on Roosevelt for the majority of their MSW disposal.

Ten counties and the city of Seattle send the majority of their MSW to Oregon facilities. One other county sent a significant amount of waste to Oregon. 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 2010 (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 2010, a total of 287,646 tons of solid waste, about 4 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. The amount of waste imported for disposal decreased from a high of 6 percent in 1996. The termination of a contract between Roosevelt Regional Landfill and a California entity accounted for much of the drop in imported waste.

Table 4.16 shows types of waste received from out-of-state for disposal. The majority of this waste (240,157 tons) went to Roosevelt Regional Landfill. Of that, 170,785 tons came from British Columbia, with the remainder from Alaska (31,383 tons), Oregon (69,371 tons) and Idaho (37 tons).

Table 4.16
Out-of-State Waste Disposed in Washington

Type of Waste	2003	2004	2005	2006	2007	2008	2009	2010
Municipal Solid Waste	77,803	144,396	147,746	166,634	195,056	183,488	210,082	225,899
Demolition	3,824	3,477	2,962	3,212	4,964	3,848	5,846	14,322
Industrial	30,584	41,171	55,085	44,725	41,600	28,601	3,386	19,852
Inert	-	59	269	65	8	59	90,020	2,563
Woodwaste	28	1	-	-	30	5,413	11	0
Ash (other than SIA)	-	-	-	-	-	-	1,271	0
Sludge	621	-	19	10,883	-	-	-	470
Asbestos	1,245	304	831	283	354	262	175	532
Petroleum Contaminated Soils	3,114	7,957	4,801	3,650	4,954	3,804	3,605	12,554
Tires	5,157	4,694	1,813	3,054	3,773	5,458	4,382	7,664
Medical	-	-	-	-	-	-	-	-
Other	508	728	1,332	1,585	1,982	1,055	744	3,234
Total	**122,884**	**202,787**	**214,858**	**234,091**	**252,720**	**231,988**	**319,522**	**287,646**

Nez Perce County, Idaho disposed of 28,000 tons of MSW in Washington's Asotin County Landfill. Asotin County and Nez Perce County 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 7,138 tons and the Weyerhaeuser limited purpose landfill in Cowlitz County received 7,689 tons. See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for imported totals for 1991 – 2010.

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2010, a total of 1,667,520 tons of waste created in Washington were disposed of in Oregon landfills, an increase from 705,608 tons in 1992. An additional 21,159 tons of tires were exported to other states for disposal. Table 4.17 compares the waste amounts and types exported and imported. See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for exported totals for 1993 - 2010.

Table 4.17
Comparison of Imported to Exported
Waste for all Solid Waste Facilities

Type of Waste	Imported		Exported	
	1991	2010	1993	2010
Municipal Solid Waste	24,475	225,899	710,515	1,119,466
Demolition	1,412	14,322	2,245	156,643
Industrial	-	19,852	864	125,022
Inert	208	2,563	-	-
Woodwaste	36	0	-	-
Ash (other than SIA)	-	0	-	1,788
Sludge	-	470	-	-
Asbestos	-	532	1,623	5,863
Petroleum Contaminated Soils	-	12,554	22,308	205,928
Other Contaminated Soils	-	-	-	28,255
Tires	-	7,664	-	21,159
Medical Waste	-	-	-	63
Other	-	3,234	18,512	24,492
Total	**26,131**	**287,646**	**756,067**	1,688,679

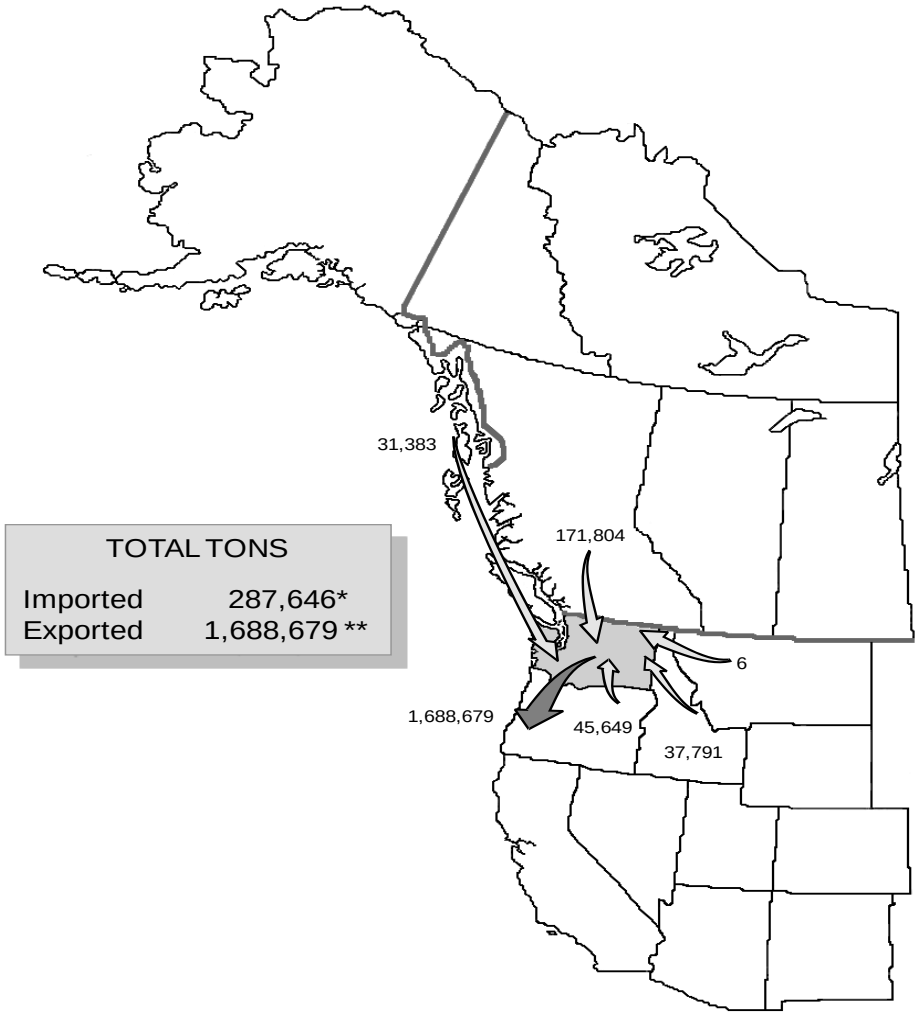
Major exporters of their MSW in Washington included the city of Seattle; Benton, Clark, Columbia, Franklin, Kitsap, Pacific, San Juan, Skamania and Whitman counties; along with portions of Snohomish, Walla Walla and Whatcom counties. Reasons to export out-of-state have to do with closure of local landfills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

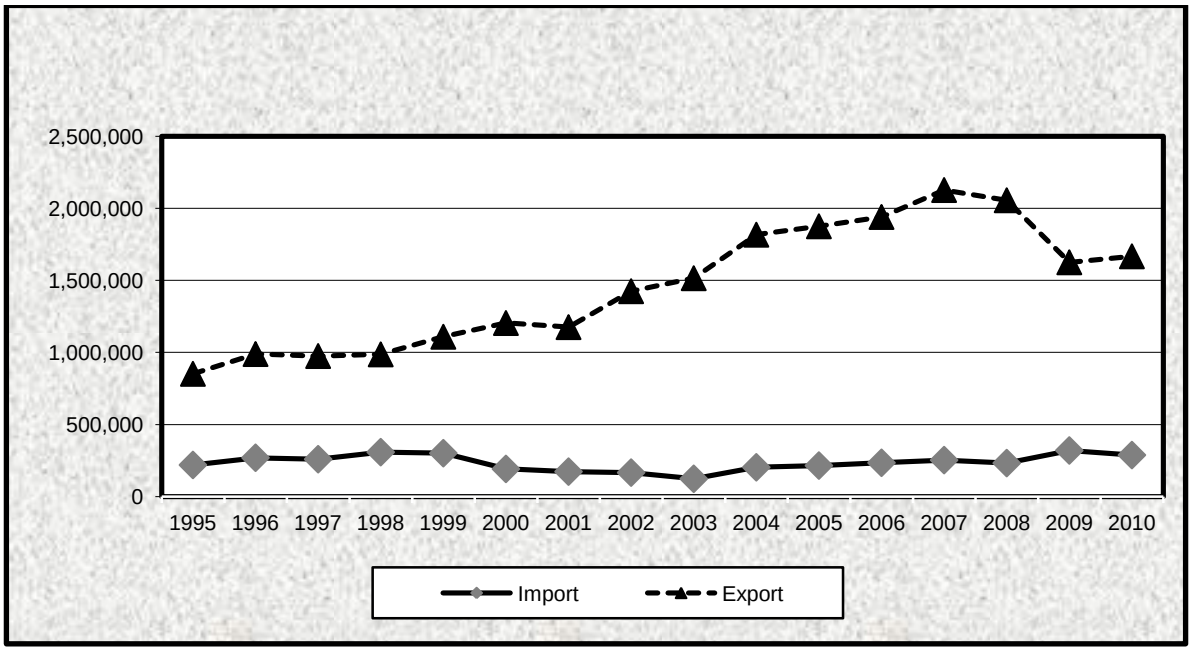
Map 4.D identifies the sources and amounts of waste that were imported and exported in 2010.

Map 4.D
Imported and Exported Waste (2010)



As shown in Figure 4.12, Washington exports have been much higher than imports since 1991. In 2010, about six times as much waste was exported to Oregon's landfills (Columbia Ridge, Wasco and Finley Buttes) as was imported to Washington for incineration or disposal.

Figure 4.12
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.

- Total MRW collected in 2010 was about 29.5 million pounds.
- The average amount of HHW disposed of per participant was 72.1 pounds, and per capita was 2.21 pounds.
- More than 3.3 percent of Washington residents used a fixed facility or collection event to remove hazardous waste from their households, about 7.9 percent of all households.
- Counties that publicly collected the most CESQG waste per capita were Yakima, Lewis, Whatcom San Juan, and Kitsap.
- Counties that collected the most used oil per capita were Garfield, Skamania, Stevens, Lincoln, Wahkiakum and Cowlitz.
- 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 pass-through funding to local governments for these purposes. CPG is historically funded by the Local Toxics Control Account (LTCA).[1] However, the 2009-11 funding comes from the State Building and Construction Account (SBCA). LTCA funds were transferred to the General Fund to help balance the state budget. SBCA is funded through bonds that are sold by the state treasurer.

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 individual MRW reports.

2010 Data

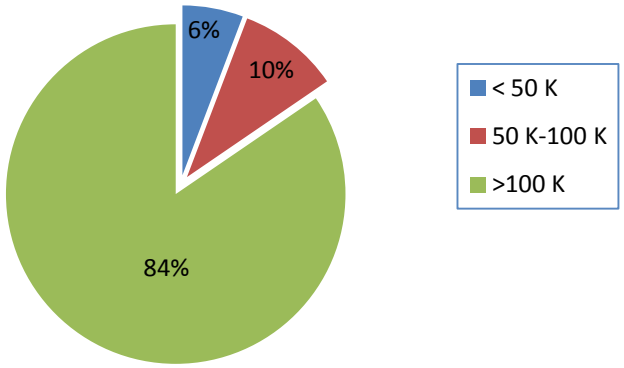
Chapter 173-350 WAC, Solid Waste Handling Standards, requires local programs to submit MRW report forms annually. Annual reports are required to be submitted by April 1 for the previous calendar year collections. Information received from local programs through MRW annual reports provides Ecology with 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.

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

This year's report focuses on 2010 data with some comparisons to data published in previous years' reports. In an effort to provide useful information for individual programs, it was decided to present data in categories by county size.

In 2010, Adams and Columbia Counties did not report any HHW or used oil collections. Additionally, Franklin and Mason Counties did not provide used oil reports for 2010. Private collectors provided the numbers shown in this report for Adams and Columbia 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. Figure 5.1 shows the percentage of the state population that reside in counties of less than 50,000, 50,000 to 100,000, and more than 100,000.

Figure 5.1
Percent of State Population by County Size



Permanent fixed facilities now service most of the state. In 2010, Benton, Chelan, Douglas, Ferry, Garfield, San Juan, Skamania and Wahkiakum counties did not have fixed facilities. Garfield residents 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 2010, 18 fixed facilities serviced CESQGs, and 5 different counties provided collection events for CESQGs.

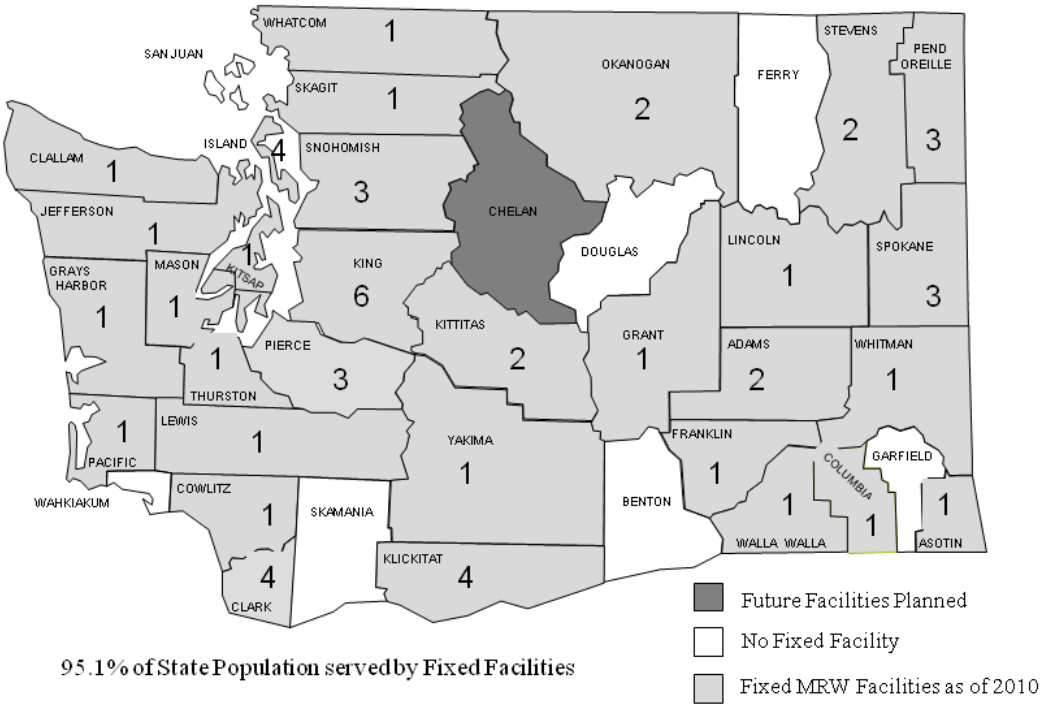
Table 5.1 shows the size of individual counties. In Washington State there are 42 programs that manage MRW. These programs include all 39 counties.

Table 5.1
Individual County Population by Size (2010)

< 50 K		50 K - 100 K		> 100 K	
Garfield	2,300	Mason	57,100	Cowlitz	100,000
Columbia	4,150	Walla Walla	59,600	Skagit	119,300
Wahkiakum	4,150	Clallam	70,100	Benton	172,900
Ferry	7,850	Grays Harbor	71,600	Whatcom	195,500
Lincoln	10,500	Chelan	73,300	Yakima	239,100
Skamania	10,900	Franklin	75,500	Kitsap	248,300
Pend Oreille	13,100	Lewis	75,600	Thurston	252,400
San Juan	16,500	Island	81,100	Clark	435,600
Adams	18,300	Grant	87,700	Spokane	470,300
Klickitat	20,500	**50 K - 100 K Total**	**651,600**	Snohomish	711,100
Asotin	21,700			Pierce	814,600
Pacific	22,100			King	1,933,400
Jefferson	29,300			**> 100K Total**	**5,692,500**
Douglas	38,500				
Kittitas	40,500				
Okanogan	40,900				
Whitman	43,600				
Stevens	44,300				
< 50K Total	**389,150**			**State Total**	**6,733,250**

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.

Map 5.A
57 MRW Facilities as of 2010



MRW Collected

As shown in Table 5.2, Washington programs collected approximately14.9 million pounds of HHW, 9.4 million pounds of used oil (UO) and 5.2 million pounds of CESQG waste, for a total of 29.5 million pounds of MRW during 2010.

HHW increased slightly in 2010. Used oil collections have shown a slight upward trend over the last two years. CESQG waste collected decreased again in 2010. This decrease can mostly be attributed to Emerald Services Inc. collection of antifreeze over the last two years, which decreased by approximately 2.9 million pounds in 2009 due to economic conditions.

Table 5.2
Total Pounds per Waste Category
Years 1999 – 2010

Collection Year	HHW lbs (no UO)	Used Oil lbs	CESQG lbs	Total MRW lbs
1999	9.9M	9.3M	637K	20.4M
2000	10.5M`	8.3M	1.1M	19.8M
2001	15.6M	11.3M	1.0M	27.9M
2002	13.5M	9.2M	1.4M	24.1M
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	14,704,355	8,925,818	5,637,850	29,268,023
2010	14,858,912	9,435,676	5,198,109	29,492,697

Collection by Waste Category and Type

As shown in Table 5.3, the most dominant waste types of MRW collected in 2010 were non-contaminated used oil, antifreeze, latex paint, oil-based paint, oil filters, and lead-acid batteries. These totals include used oil and antifreeze collected at all collection sites. The six specific waste types accounted for approximately 74 percent of the estimated 29.5 million pounds of MRW collected in 2010.

Table 5.3
Six Most Dominant MRW Waste Types Collected in 2010

Waste Type	Total Lbs.
Non-Contaminated Used Oil	9,218,066
Antifreeze	4,594,528
Latex Paint	2,548,713
Oil-based Paint	2,215,629
Oil Filters	1.988,269
Lead-Acid Batteries	1,297,635
Total	**21,862,840**

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 2010

Waste Type	HHW	CESQG	Total
Acids	140,900	34,504	175,404
Acids (Aerosol Cans)	375	0	375
Aerosols (Consumer Commodities)	162,014	27,550	189,564
Antifreeze	2,226,538	2,367,990	4,594,528
Bases	185,093	30,692	215,785
Bases, Aerosols	472	23	495
Batteries (Lead Acid)	1,285,531	12,104	1,297,635
Batteries (Small Lead Acid)	20,817	25,933	46,750
Batteries (Dry Cell)	285,938	28,203	314,141
Batteries (Nicad/NIMH/Lithium)	47,755	18,645	66,400
CFCs	3,662	0	3,662
Chlorinated Solvents	5,828	7,755	13,583
Compressed Gas Cylinders	1,595	168	1,763
CRT's	430,011	13,084	443,095
Cyanide Solutions	16	8	24
Dioxins	1,024	0	1,024
Electronics	511,560	54,351	565,911
Fire Extinguishers	5,608	607	6,215
Flammable Solids	3,614	25,807	29,421
Flammable Liquids	623,152	294,081	917,233
Flammable Liquids, Aerosols	0	27	27
Flammable Liquids Poison	148,143	7,455	155,598
Flammable Liquid Poison, Aerosols	5,878	1,974	7,852
Flammable Gas (Butane/Propane)	105,409	696	106,105
Flammable Gas Poison	1,574	20	1,594
Flammable Gas Poison, Aerosols	66,031	1,394	67,425
Latex Paint	2,427,885	120,828	2,548,713
Latex Paint, Contaminated	244,987	22,347	267,334
Mercury Compounds (Dental Amalgam)	36	9,495	9,531

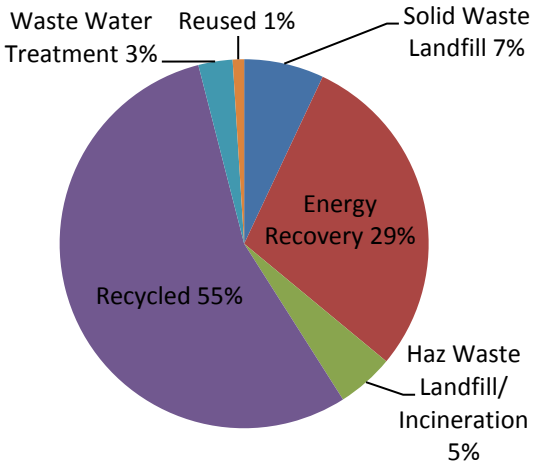
Waste Type	HHW	CESQG	Total
Mercury Containing Batteries (Button, etc)	0	1	1
Mercury Devices (Monometers, Barometers, etc.)	895	220	1,115
Mercury (Fluorescent Lamps & CFLs)	278,552	152,121	430,673
Mercury (Pure Elemental)	609	563	1,172
Mercury (Switches & Relays)	178	7	185
Mercury (Thermostats/Thermometers)	938	1,296	2,234
Nitrate Fertilizer	4,599	362	4,961
Non-PCB Containing Light Ballasts	2,734	8,550	11,284
Non-Regulated Liquids	42,348	841,918	884,266
Non-Regulated Solids	136,405	59,297	195,702
Oil-Based Paint	1,965,189	250,440	2,215,629
Oil-Based Paint, Contaminated	451	48,502	48,953
Oil Contaminated (oily H2O, oil w/PCB's, etc.)	27,816	189,794	217,610
Oil Filters	1,982,084	6,185	1,988,269
Oil Filters Crushed	19,822	0	19,822
Oil Non-Contaminated	9,030,492	187,574	9,218,066
Oil Stained Rags, Absorbent Pads, etc.	2,909	9,902	12,811
Organic Peroxides	2,831	72	2,903
Other Dangerous Waste	79,497	433,583	513,080
Oxidizers	35,714	4,397	40,111
Paint Related Materials	791,156	199,635	990,791
PCB Containing Light Ballasts	21,042	11,829	32,871
Pesticide/Poison Liquid	290,067	21,982	312,049
Pesticide/Poison Solid	189,700	21,229	210,929
Photo/Silver Fixer	319	9,599	9,918
Reactives	4,202	155	4,357
Tar and/or Adhesives	10,788	10,523	21,311
Used Cooking Oil	54,437	0	54,437
MRW TOTAL	**23,917,220**	**5,575,477**	**29,492,697**

* 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 is now included with the HHW total in Table 5.4 instead of the CESQG total as in the past. Note: In 2010 MRW facilities recycled 1,444,781 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. Five percent of all MRW is disposed at a hazardous waste landfill or incinerator. Figure 5.2 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 5.2
MRW Final Disposition



MRW Data

Table 5.5 shows various data by county. This data includes privately collected CESGQ wastes by Emerald Services and Phillip Services Corporation. The included private collection data was first presented this way in 2008, with previous reports including this data for Pierce and King counties only. 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 Total lbs
Adams*	6,484	0	0.0%	$0	0.00	0	8,383
Asotin	9,969	1,504	15.1%	$31.15	53.21	80,033	112,602
Benton	67,335	4,990	7.4%	$60.83	33.59	167,630	209,369
Chelan	34,910	709	2.0%	$99.23	120.62	85,521	195,912
Clallam	35,569	640	1.8%	$160.58	124.97	79,982	228,612
Clark	168,969	11,346	6.7%	$52.35	197.66	2,242,642	4,315,131
Columbia*	2,190	0	0.0%	$0	0.00	0	816
Cowlitz	43,360	1,796	4.1%	$52.70	370.45	665,323	983,786
Douglas^	15,691	0	0.0%	$0	0.00	0	55,464
Ferry	4,191	13	0.3%	$150.62	51.31	667	3,701
Franklin	24,015	314	1.3%	$25.96	37.09	11,645	394,602
Garfield	1,337	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	18,098
Grant	35,161	207	0.6%	$154.04	135.57	28,062	80,546
Grays Harbor	35,887	1,807	5.0%	$103.99	57.60	104,078	346,508
Island	39,014	2,650	6.8%	$70.42	96.92	256,834	779,169
Jefferson	16,756	1,388	8.3%	$75.80	61.06	84,756	151,925
King	845,265	64,649	7.6%	$40.53	46.58	3,011,303	5,847,534
Kitsap	105,592	8,277	7.8%	$92.94	119.55	989,540	1,528,160
Kittitas	20,223	558	2.7%	$143.24	211.57	118,055	231,309
Klickitat	10,240	8,700	85.0%	$4.29	10.02	87,199	113,199
Lewis	34,492	1,200	3.5%	$104.90	235.53	282,640	517,814
Lincoln	5,862	287	4.9%	$25.76	170.70	48,990	102,563
Mason	30,787	314	1.0%	$51.43	96.97	30,450	32,297
Okanogan	21,323	411	1.9%	$130.80	70.44	28,952	57,488
Pacific	15,424	225	1.4%	$59.11	72.00	16,200	45,679
Pend Oreille	7,673	7,300	95.1%	$6.17	11.14	81,323	105,944
Pierce	328,890	9,563	2.9%	$62.07	45.78	437,760	1,941,826
San Juan	11,783	242	2.0%	$127.23	117.12	28,344	82,246
Skagit	50,323	4,120	8.2%	$28.01	58.74	242,000	452,419
Skamania	5,493	264	4.8%	$83.05	94.58	24,970	81,677
Snohomish	283,495	10,270	3.6%	$65.40	191.83	1,970,059	3,590,147
Spokane	200,362	33,500	16.7%	$9.56	26.12	875,180	2,049,042
Stevens	20,230	0	0.0%	$0	0.00	113,720	294,426
Thurston	106,790	14,554	13.6%	$27.51	133.20	1,938,535	2,374,379
Wahkiakum	2,120	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	20,193

County	Housing Units	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil Total lbs
Walla Walla	23,568	2,094	8.9%	$78.50	32.57	68,200	132,176
Whatcom	89,364	7,418	8.3%	$45.27	32.66	242,294	655,196
Whitman	19,227	930	4.8%	$52.88	33.90	31,525	56,518
Yakima	86,183	3,701	4.3%	$83.28	103.89	384,500	1,295,841
STATEWIDE	2,865,547	205,941	7.2%	$41.34	72.15	14,858,912	29,492,697

* These counties did not report in 2010 and total pounds shown represents the amount private companies collected from CESQG's in those jurisdictions.
^ These counties scaled back operation in 2010 and pounds reported represent those collected at limited MRW sites.

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. The participation number and rate for Klickitat and Pend Oreille counties seem high and were not verified before this report was completed.

Cost per Participant

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 more than $8.5 million in 2010 statewide (does not include CESQG costs). In 2009, HHW programs spent approximately $10.1 million. In 2010, HHW programs reduced their costs by more than $1.5 million while still increasing the amount of waste they collected.

HHW Pounds per Participant and per Capita

The average pounds collected statewide per participant for HHW was 72.15. Table 5.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2008-2010. Statewide, HHW pounds per capita collected was 2.21 pounds.

Table 5.6
High Collections of HHW (No Used Oil Sites)
Pounds per Capita by County in 2008-10

HHW 2008		
County	**Size**	**Lbs**
Pend Oreille	<50K	5.22
Clark	>100K	5.18
Lewis	50-100K	4.82
Klickitat	<50K	4.52
Kittitas	<50K	3.74

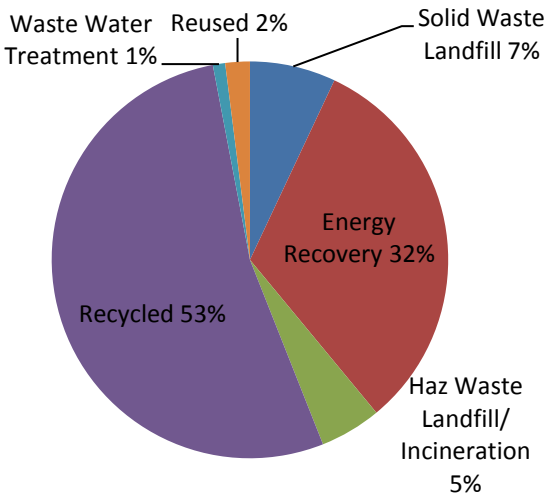
HHW 2009		
County	**Size**	**Lbs**
Pend Oreille	<50K	6.28
San Juan	<50K	5.80
Thurston	>100K	5.41
Snohomish	>100K	4.61
Klickitat	<50K	4.27

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

HHW Disposition

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

Figure 5.3
HHW Final Disposition



Conditionally Exempt Small Quantity Generator (CESQG)

Twenty-one local MRW programs collect CESQG wastes. King County began a pilot program to collect CESQG wastes in 2008 and that pilot continued in 2009. The city of Tacoma offers CESQG's collection assistance for fluorescent lights only. Counties that sponsored CESQG waste collections are:

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

The top five counties that publicly collected the most CESQG waste per capita in 2010 were:

- Yakima
- Lewis
- Whatcom
- San Juan
- Kitsap

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 2010 were:

- Franklin
- Island
- Clark
- Lincoln
- Wahkiakum

Table 5.7
2010 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	8,383	8,383	0.45
Asotin	2,527	0.12	904	3,431	0.16
Benton	7,356	0.04	17,675	25,031	0.14
Chelan	11,533	0.16	16,017	27,550	0.37
Clallam	0	0	5,556	5,556	0.08
Clark	0	0	1,290,453	1,290,453	2.96
Columbia	0	0	816	816	0.2
Cowlitz	17,486	0.17	10,312	27,798	0.28
Douglas	0	0	7,150	7,150	0.18
Ferry	0	0	37	37	0
Franklin	0	0	382,957	382,957	5.07
Garfield	0	0	98	98	0.04
Grant	480	0.01	11,563	12,043	0.14
Grays Harbor	13,450	0.19	14,032	27,482	0.38
Island	19,218	0.24	349,123	368,341	4.54
Jefferson	6,465	0.22	3,155	9,620	0.33
King	82,650	0.04	777,052	859,702	.44
Kitsap	105,171	0.42	31,304	136,475	0.55
Kittitas	4,542	0.11	4,187	8,729	0.21
Klickitat	0	0	117	117	0
Lewis	65,194	0.86	7,522	72,716	0.96
Lincoln	0	0	13,939	13,939	1.33
Mason	0	0	1,847	1,847	0.03
Okanogan	3,598	0.09	4,686	8,284	0.2
Pacific	632	0.03	98	730	0.03
Pend Oreille	0	0	475	475	0.04
Pierce*	3,668	0	714,733	718,401	0.88
San Juan	9,559	0.58	0	9,559	0.58
Skagit	15,831	0.13	34,588	50,419	0.42
Skamania	0	0	12,107	12,107	1.11
Snohomish	103,368	0.15	164,925	268,293	0.38
Spokane	0	0	611,315	611,315	1.3
Stevens	0	0	3,570	3,570	0.08
Thurston	33,456	0.13	39,100	72,556	0.29
Wahkiakum	0	0	5,504	5,504	1.33
Walla Walla	0	0	12,017	12,017	0.2
Whatcom	117,488	0.60	129,954	247,442	1.26
Whitman	0	0	7,381	7,381	0.17
Yakima	231,008	0.97	26,145	257,153	1.07
Statewide Totals	**854,680**	**0.13**	**4,720,797**	**5,575,477**	**.83**

* 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 2010 were:

- Antifreeze
- Non-Regulated Liquids
- Flammable Liquids
- Oil-Base Paint
- Mercury Collections (includes all mercury waste types)

Table 5.8
Washington State Public and Private CESQG Collections for 2010 by Waste Type

Waste Type	Public Collections	Private Collections	Totals
Antifreeze	17,504	2,350,486	2,367,990
Non-Regulated Liquids	9,297	832,621	841,918
Other DW	3,633	429,950	433,583
Flammable Liquids	112,475	181,606	294,081
Paint - Oil Base	213,141	37,299	250,440
Paint Related Materials	29,896	169,739	199,635
Used Oil-Cont. (oily water, etc)	19,678	170,116	189,794
Used Oil - Non-Contaminated	40,723	146,851	187,574
Mercury Collections	121,107	42,575	163,682
Paint – Latex	110,318	10,510	120,828
Non-Regulated Solids	1,099	58,288	59,297
Electronics	0	54,351	54,351
Paint - Oil Base –Contaminated	0	48,502	48,502
Acids	20,056	14,448	34,504
Bases	21,937	8,755	30,692
Batteries - Alkaline/Carbon	11,684	16,519	28,203
Aerosols - Consumer Commodities	8,896	18,564	27,550
Batteries - Small Lead Acid	13,467	12,466	25,933
Flammable Solids	5,351	20,456	25,807
Paint - Latex Contaminated	8,522	13,825	22,347
Pesticides - Poison/Liquid	11,890	10,092	21,982
Pesticides - Poison/Solids	11,280	9,949	21,229
Batteries-Nicad/Lithium	4,422	14,223	18,645
CRT's	0	13,084	13,084
Batteries - Auto Lead Acid	9,132	2,972	12,104
PCB Containing Light Ballasts	9,800	2,029	11,829
Tar/Adhesives	333	10,190	10,523
Oil Stained Rags, Absorbent Pads, etc.	783	9,119	9,902
Photo/Silver Fixer	8,035	1,564	9,599
Non-PCB Containing Light Ballasts	5,643	2,907	8,550
Chlorinated Solvents	5,626	2,129	7,755
Flammable Liquid Poison	6,534	921	7,455
Oil Filters	4,491	1,694	6,185
Oxidizers	3,264	1,133	4,397
Flammable Liquid Poison – Aerosols	1,959	55	2,014
Flammable Gas Poison - Aerosols	1,394	0	1,394
Flammable Butane/Propane	438	258	696
Fire Extinguishers	358	249	607
Nitrate Fertilizer	350	12	362
Compressed Gas Cylinders	0	168	168
Reactives	101	54	155
Organic Peroxides	54	18	72
Flammable Gas Poison	0	28	28
Bases – Aerosol	1	22	23
Cyanide Solutions	8	0	8
Totals	**854,680**	**4,720,797**	**5,575,477**

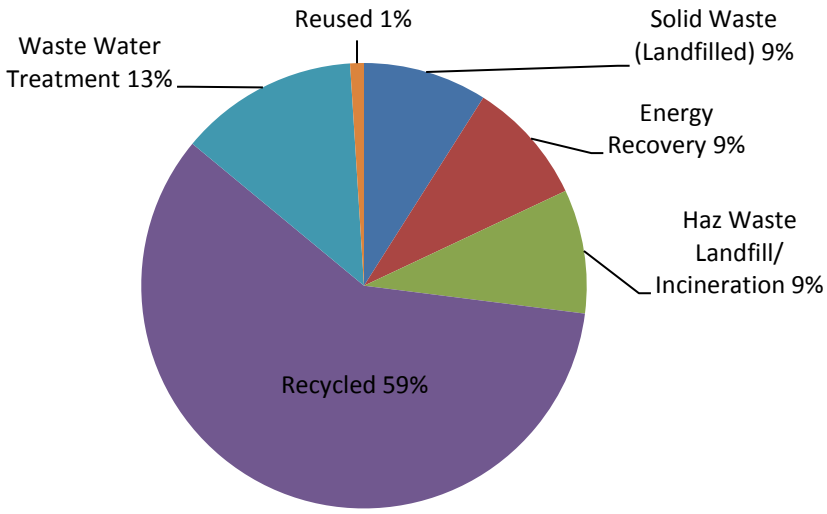
* Note: Approximately 42 percent of all CESQG wastes collected comes from the collection of antifreeze.

CESQG Disposition

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

- 32 percent of HHW was sent for energy recovery versus 9 percent of CESQG wastes.
- 1 percent of HHW was sent through a waste water treatment plant versus 13 percent of CESQG wastes.
- In general, less HHW waste gets landfilled (12%) compared to CESQG waste (18%).

Figure 5.4
CESQG Final Disposition



Collection/Mobile Events

Table 5.9 represents the number of mobile and collection events held statewide from 2008-10. The number of events decreased from for the first time since we began tracking this number (141 events in 2009 to the 125 events in 2010). However, the total pounds collected decreased by only approximately 36 thousand pounds.

The amount of waste collected through these types of events was approximately 2 million pounds in 2010, which is approximately 7 percent of all MRW collected in 2010, down from 8 percent in 2008 and 11 percent in 2007. The Waste Mobile in King County conducted 45 mobile events that collected a little more than 885,000 pounds of MRW in 2010.

Table 5.9
2008-10 Collection/Mobile Event Collection Amounts

Type of Event	Number of Events			Pounds Collected		
	2008	2009	2010	2008	2009	2010
Mobile	90	99	79	1,909,138	1,574,873	1,606,286
Collection	45	42	46	694,049	507,311	439,572
Totals:	**135**	**141**	**125**	2,603,187	2,082,184	2,045,858

Used Oil Sites

In 2010, facilities and collection sites reported collecting a total of 9,435,676 pounds of used oil. Used oil collection peaked statewide (12.4 million pounds) in 2004 and has steadily declined up until the last two years. Even with the slight increase in used oil collections in 2009 and 2010 (approximately 800,000 pounds), 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 show the six counties with the highest collections in pounds per capita by county size for 2008-10.

Table 5.10
Used Oil High Collection Counties - Pounds per Capita by County Size
Collected at Facilities and Used Oil Collection Sites 2008-10

Used Oil Sites - 2008		
County	**Size**	**Lbs**
Garfield	<50K	9.1
Stevens	<50K	4.8
Skamania	<50K	4.0
Lincoln	<50K	3.5
Pacific	<50K	3.4
San Juan	<50K	3.2

Used Oil Sites - 2009		
County	**Size**	**Lbs**
Garfield	<50K	8.0
Stevens	<50K	4.3
Skamania	<50K	3.8
Pend Oreille	<50K	3.8
Wahkiakum	<50K	2.9
Cowlitz	50-100K	2.9

Used Oil Sites – 2010		
County	**Size**	**Lbs**
Garfield	<50K	7.8
Skamania	<50K	4.1
Stevens	<50K	4.0
Lincoln	<50K	3.8
Wahkiakum	<50K	3.5
Cowlitz	>100K	2.9

Statewide Level of Service

The Washington State Office of Financial Management reported that as of 2010, Washington State had an estimated 2,865,547 housing units[2]. MRW Annual Reports revealed there were 205,941 participants who used the services of either an MRW collection event or MRW fixed facility. The actual number of households served is larger, because most used oil sites do not

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

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 226,535 participants served in 2010. This number represents 7.9 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	2006	8.6
2002	6.8	2007	9.1
2003	8.9	2008	8.7
2004	8.9	2009	8.3
2005	9.0	2010	7.9

Trends in Collection

The majority of counties in Washington State have at least one fixed facility. While the number of collection events held in 2010 declined, collection events can be a useful strategy to reach residents inconveniently located from fixed facilities.

Overall, MRW collections leveled off between 2005 and 2007. 2009, like 2008, has seen a significant reduction in the amount of MRW collected. This is most likely due to some larger programs with policies of no longer collecting latex paint and the overall state of the economy. The slight increase seen in overall collections of MRW in 2010 is something to monitor, as it may either be a slight anomaly of the decreasing trend in collections, or it is the beginning of an upward trend.

Also, as product stewardship programs become more prevalent in the future, collection numbers may go down or up depending on how MRW programs are utilized by stewardship programs. The Electronics Recycling Program started collecting covered electronic products in 2009. As expected, MRW programs collected approximately 1.3 million pounds less in 2009 than 2008. MRW programs collected close to two million pounds of electronics and CRTs in 2008 compared to a little over 700,000 pounds in 2009 and a little over 1 million pounds in 2010. For more information about the E-Cycle Washington Program, see Chapter 2.

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 is scheduled for introduction in the 2012 legislative session. Pharmaceuticals will also be on the legislative agenda again in 2012.

This is a positive shift in MRW management as some manufacturers are beginning to accept responsibility for the end-of-life management costs of their products versus externalizing those costs onto public agencies.

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?

Product stewardship principles have also guided establishment of the Take-it-Back Network in King County, Snohomish County, Pierce County, Yakima County and the city of Tacoma.

The Take-it-Back Network was set up by local governments and consists of "*a group of retailers, repair shops, nonprofit organizations, waste haulers and recyclers that offer convenient options for recycling certain products that should not be disposed in the trash.*" Because the Take-it-Back Network is a voluntary program for businesses, it can be difficult to get data on the total amount of materials brought back to them.

Waste Streams of Concern

Pharmaceuticals and personal care products continue to be an area of concern for local governments and the public.

Groups like the Northwest Product Stewardship Council are working with state and local governments, NGOs, retailers and manufacturers to develop strategies to manage these emerging wastes based on product stewardship principles.

Pharmaceuticals

Pharmaceutical wastes have drawn more and more attention from state and local governments. A USGS Reconnaissance Study from 1999 - 2000 tested 139 streams for the presence of 95 chemicals, including pharmaceuticals.

Steroids, nonprescription drugs and insect repellent were the chemical groups most frequently detected. Detergent metabolites, steroids and plasticizers generally were measured at the highest concentrations. Forty-six of the chemicals were pharmaceutically active.

In 2006, another study by Eastern Washington University and the USGS analyzed nine biosolids products from seven states. The concentration of pharmaceuticals in biosolids was higher than in water and treated wastewater.

In 2005, 53 million prescriptions were filled in Washington State. A 2006 King County Survey found that only 33 percent of people will use all of their medication. This leaves a substantial amount of pharmaceutical waste to manage. This becomes significant from a public health standpoint.

Two tadpoles after 57 days of development in the lab. The one on the right, which has yet to sprout limbs, was exposed to fluoxetine, also known as Prozac, at 50 parts per billion.

In 2004 the American Association of Poison Control Centers (62 participating members serving 294 million people) reported a total of 2.4 million exposures. Fifty-eight percent of those exposures were from pharmaceuticals.

In 2006, a new two-year pilot program started to collect pharmaceuticals at local pharmacies. Group Health sites participated initially, with Bartell Drugs participating later. Between October 2006 and September 2007, 2,972 pounds of medication were collected.

Since this time some local governments have partnered with law enforcement agencies to collect unwanted or leftover medicines. Over the last two years, these programs safely collected and disposed of about 75,000 pounds.

The environmental side effects of pharmaceuticals show that aquatic and terrestrial organisms may be affected through endocrine disruption and anti-microbial resistance.

Though product stewardship legislation has not passed over the last couple of years, it will be introduced again in 2011.

Personal Care Products

Personal care products are also becoming a concern for state and local governments. Personal care products include cosmetics, deodorants, nail polish, lotions, hair spray, styling gel, perfumes and colognes. According to industry estimates reported by the Toxic-Free Legacy Coalition:

- Consumers may use as much as 25 cosmetic products containing more than 200 different chemical compounds on any given day.

- Eighty-nine percent of the approximately 10,500 ingredients used in personal care products have not been screened for safety by the FDA or anyone else.

- One chemical of concern found in personal care products are phthalates. Phthalates are a reproductive toxin/endocrine disrupter. Some studies have shown impacts on male reproductive system development.

    - Moms with higher phthalate exposures were more likely to have boys with altered genital development including smaller penises and undescended testes (Swan et al., 2005; Marsee et al., 2006).

    - Baby boys exposed to higher levels of phthalates in breast milk had slightly, but significantly decreased testosterone levels (Main et al., 2005).

Appendix A
Tire Pile Cleanups – Historical Information

Tire Pile Cleanup 1990-98

In 1989 the Washington State Legislature passed Substitute House Bill (SHB) 1671 (Sections 92 – 95) which established a $1 per tire fee on the retail sale of new vehicle tires for the Vehicle Tire Recycling Account (VTRA). This account provided approximately $14.4 million to clean up 28 unpermitted tire piles in 9 counties around Washington. Collection of the tire fee ended in 1994 and the account was fully spent in 1998. Table A-1 summarizes the tire pile cleanups performed using the VTRA.

Table A-1
Tire Pile Cleanup 1990-98

Year	Sites	*Tons of Tires	Cost
1990	1	922	$102,667
1991	14	7,940	$1,816,894
1992	3	12,633	$1,241,133
1993	2	570	$65,394
1994	1	9,320	$166,000
1995	2	41,586	$4,114,859
1996	3	23,802	$3,235,372
1997	1	1,750	$310,200
1998	1	28,000	$3,378,947
TOTAL	**28**	**126,523**	**$14,431,466**

*One ton of tires is equal to about 100 passenger tires

Tire Pile Cleanup 2007-10

In 2005, the Legislature passed SHB 2085, creating a Waste Tire Removal Account to fund cleanup of unauthorized and unlicensed tire piles. This account provided $9.4 million to clean up 175 unpermitted tire piles in 30 counties around Washington. Starting in 2010, Ecology receives a biennial budget of $1 million from this account. The remainder of the account transfers to the Washington State Department of Transportation's Motor Vehicle Account.

Table A-2 provides a summary listed by county of the completed tire removals using the Waste Tire Removal Account funding. The cost of all removals, total tons removed, and amount of tires recycled are listed in the table. Map A-1 shows the approximate locations of these tire

cleanup efforts, including one dot for the 14 sites located in and around Goldendale (Klickitat County). Common recycling and reuse of waste tire materials includes crumb rubber, stamped rubber bumpers, tire rings, fuel for cement kilns and scrap steel (wheel rims).

Table A-2
Tire Pile Cleanup 2007-10

County	Sites	Tons	Cost	% Recycled
Adams	1	213	$ 51,659	100%
Benton	8	1,044	$ 227,252	84%
Chelan	4	814	$ 188,400	72%
Clallam	7	1,321	$ 368,883	78%
Clark	3	742	$ 144,209	94%
Cowlitz	5	331	$ 70,011	93%
Franklin	5	1,293	$ 326,819	91%
Grant	14	2,636	$ 707,921	78%
Grays Harbor	11	1,620	$ 289,573	92%
Island	1	43	$ 7,852	100%
Jefferson	7	1,046	$ 221,390	78%
King	11	2,233	$ 418,061	91%
Kitsap	2	249	$ 42,630	99%
Kittitas	6	965	$ 242,169	100%
Klickitat	17	21,489	$ 2,464,005	13%
Lewis	13	6,390	$ 1,036,278	39%
Lincoln	7	747	$ 236,396	92%
Mason	6	1,303	$ 237,354	97%
Okanogan	2	557	$ 157,635	99%
Pend Oreille	3	213	$ 26,693	98%
Pierce	8	823	$ 158,789	95%
Skagit	1	62	$ 13,154	91%
Snohomish	4	486	$ 127,258	92%
Spokane	5	1,399	$ 277,789	100%
Stevens	1	97	$ 23,367	100%
Thurston	5	1,225	$ 244,165	97%
Walla Walla	3	415	$ 105,445	88%
Whatcom	4	237	$ 61,784	73%
Whitman	1	278	$ 50,652	66%
Yakima	10	4,560	$ 921,052	20%
TOTAL	**175**	**54,832**	**$ 9,448,644**	**84%**

Map A-1
Completed Tire Pile Cleanups in Washington 2007-10