# Solid Waste In Washington State

## Sixteenth Annual Status Report

DEPARTMENT OF
ECOLOGY
State of Washington

Solid Waste and Financial Assistance Program
December 2007
Publication #07-07-048

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Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

December 2007
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http://www.ecy.wa.gov/programs/swfa/solidwastedata/

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Ellen Caywood
Environmental Planner
Solid Waste & Financial Assistance Program

# Chapter I
# Issues Facing Solid Waste

## Beyond Waste

The Beyond Waste Plan, issued in November 2004, is a long-term strategy for systematically eliminating wastes and the use of toxic substances. Beyond Waste meets state law requirements for statewide solid- and hazardous-waste plans for the state of Washington. Based on research, it was decided that the first steps for progressing toward Beyond Waste should focus on the following five areas or initiatives:

1. Moving toward Beyond Waste with Industries
2. Reducing small volume hazardous materials and wastes
3. Establishing a recycling system for organic materials
4. Moving toward Beyond Waste through "Green Building" practices
5. Measuring progress toward Beyond Waste

Ecology has developed performance indicators to track progress toward the major *Beyond Waste* initiatives - industries, green building, organics recycling, and small-volume hazardous wastes. Specific indicators for the initiatives have been developed, baselines have been established, and the indicators are available on the *Beyond Waste* progress report[1]. Specific indicators include solid waste generation, hazardous waste generation, risk from toxic releases, solid waste recycling, hazardous waste recycling, electronics recycling, organics recycling, and green building. *Chapter II Partnering for the Environment* discusses some specific projects occurring statewide that are helping to implement the *Beyond Waste Plan*.

The *Beyond Waste Plan* set forth goals for the next 30 years. In order to make progress toward the goals, recommendations for the first five years were include to move the state toward those goals. Ecology, both the Solid Waste and Financial Assistance Program and the Hazardous Waste and Toxics Reduction Program who jointly developed the plan, will be assessing progress toward the five-year milestones. An update of the *Beyond Waste Plan* is scheduled for completion by November 2009. This will include the assessment of progress and a set of recommendations for the next five years of progress toward reaching the *Beyond Waste* goals and vision.

## Solid Waste Financing

As part of the *Beyond Waste Plan* for hazardous and solid waste management, Ecology outlined multiple recommendations to reduce waste generation, increase recycling and reduce the use of toxic substances in Washington. The *Beyond Waste Plan* recognized the importance of addressing funding needs as governments, businesses, and households take steps to eliminate wastes and toxics. Because taxes and fees on solid and hazardous waste generation support many current waste management activities, reducing waste generation could decrease funding for the overall system

[1] The *Beyond Waste* progress report is available at the *Beyond Waste* website: www.ecy.wa.gov/beyondwaste/

that helps collect, transport, recycle, and dispose of waste. An analysis of current financing for the solid waste system was the first step in a longer term effort to examine future funding options and identify stable ways to fund solid waste management efforts, while reducing waste.

Ecology and the Solid Waste Advisory Council (SWAC) undertook the first stage of this analysis by developing information about costs. *Solid Waste Management Cost Flows in Washington State* is available online[2]. The key findings of the solid waste financing study to date include:

- In 2005, governments, businesses, and residents of Washington spent more than $.8 billion on solid waste management, which averages to $290 per capita.
- Municipal solid waste accounted for 40% of total expenditures, the largest waste stream
- Construction and demolition debris represented about 30% of the total
- Recycling, composting, and waste reduction contribute about 15% of the total
- Moderate risk waste accounted for about 2% of the total

SWFAP is continuing work on the long-term issues of financing the solid waste system as we move to a future of less "waste" being produced. The next phase will be to develop options, working with the State Solid Waste Advisory Committee, for future sustainable funding for solid waste programs.

## Climate Change and Beyond Waste

Governor Gregoire's Climate Change Challenge Executive Order 07-02 set ambitious goals for Washington State for reducing and preparing for climate change impacts. Ecology and other agencies are developing recommendations and plans for action for the 2009 legislative session.[3]

Many of the *Beyond Waste* Initiatives directly support effort for climate change. Green building has a direct link to climate change. The primary goal of the Green Building Initiative is to make green building mainstream in Washington State.

Data from the US Energy Information Administration illustrates that buildings are responsible for almost half (48%) of all energy consumption and green house gas (GHG) emissions annually; globally the percentage is even greater. Seventy-six percent (76%) of all power plant-generated electricity is used just to operate buildings. Clearly, immediate action in the Building Sector is essential if we are to avoid hazardous climate change.

Future building practices in Washington State will be critical to the success of Executive Order 07-02 Washington Climate Change Challenge. In 2005, Washington was the first state in the country to require that all new buildings projects and major renovations that receive public funding be built 'green' (see discussions below). *Chapter 39.35D RCW High-performance public buildings* specifies three standards, depending on building types, to which all buildings must comply: Leadership in Energy and Environmental Design (LEED) Silver, Washington Sustainable Schools Protocol, and The Evergreen Standard for Affordable Housing.

Waste prevention and diversion from landfill disposal (or recycling) are also potent strategies for reducing greenhouse gas emissions and conserving energy. Products that enter the waste stream

[2] http://www.ecy.wa.gov/programs/swfa/swac/docs/SWAC2007SeptemberCostSynopsis.pdf
[3] Ecology's Climate Change work is discussed at http://www.ecy.wa.gov/climatechange/index.htm

have energy impacts and associated greenhouse gas (GHG) emissions at each stage of their life cycle: 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 GHG emitted during decomposition. Additionally, when transporting waste to a landfill GHG are emitted through the combustion of fossil fuels.

Fossil fuels are also required for extracting and processing the raw materials necessary to replace those materials that are being 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 GHG emitted during extraction. Waste prevention means more efficient resource use, and making products from recycled materials requires less energy. Both lower GHG emitted during manufacturing.

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

Washington's measured diversion efforts for 2006 reduced GHG emissions by over 3 million tons or over 1,000 pounds per person. This is similar to removing 2.5 million passenger cars from the roadway each year - over half of the passenger cars in Washington.

The 7.6 million tons of material diverted from disposal in Washington in 2006 saved over 116 trillion BTUs of energy. This is equal to about half of all energy used in homes in the state annually.

## Green Building Standards

> **Executive Order 07-02:** *Lead the nation in adopting high performance green building standards and having one of the most energy efficient building codes in the nation.*

Data from the US Energy Information Administration illustrates that buildings are responsible for almost half (48%) of all energy consumption and GHG emissions annually; globally the percentage is even greater. Seventy-six percent (76%) of all power plant-generated electricity is used just to operate buildings. Clearly, immediate action in the Building Sector is essential if we are to avoid hazardous climate change.

One of the goals outlined by the Governor in Executive Order 07-02 Washington Climate Change Challenge was to increase the number of ‘green’ jobs in Washington by nearly three times (from 8,400 in 2004 to 25,000 by 2020). Green building and green building related industries can significantly contribute (if not account for all) to meeting this goal. The following briefly describes ‘green’ jobs that can result from the expansion of Washington’s green building sector:

Construction: Washington Department of Ecology in collaboration with Washington Department of General Administration is currently offering LEED training for contractors hired to work on projects affected by Chapter 39.35D RCW High-performance public buildings. The trainings have been offered since August 2007 and are conducted on an as-needed basis. To date, over 100 contractors/sub-contractors have received the training.

Transportation: Green building standards require that new construction be near public transportation options. Washington State already requires that state agencies purchase hybrid and/or low emission vehicles. Ensuring that this is implemented can offer points in the LEED system.

Lumber: The Washington Department of Natural Resources is currently in the process of having over 140,000 acres of land they manage certified under the Forest Stewardship Council (FSC) program. Growth in demand for FSC wood products is expected to continue to rise and could result in the creation of a 'green' timber industry in Washington.

Recycling/Recycled Product Development: Green building credits are offered for recycling construction/demolition waste, for using materials made from recycled content, and for integrating recycling programs within the buildings themselves. There currently exists tremendous opportunities to both create jobs around the need for a more comprehensive recycling infrastructure in underserved parts of Washington and also for industries to develop new building products that contain recycled materials.

Alternative Energy/Commissioning: Green building also offers an opportunity to develop a relatively new energy related sector: commissioning. Verifying that a building's energy consumption is aligned with its estimates is both required to achieve certain LEED credits and is a good practice. As more buildings are built to green standards, the need to verify that actual energy use is consistent over time will also grow.

## Public Events Recycling Law

On July 22, 2007, the Public Events Recycling Law (RCW 70.93.093) went into affect in Washington State. This law requires a recycling program at every official gathering and sports facility in which vendors are selling beverages in single-use aluminum cans, and/or glass and/or plastic bottles and where there is a commercial curbside recycling collection program in the area. The intent of this law is to increase recycling opportunities, thus reducing waste, at official gatherings and sports facilities statewide. The beverage vendors are responsible for providing and funding the recycling program at the official gathering/sports facility.

The message from Ecology to local governments and haulers includes:

- Recycling at public events, including sports events, is now required by law in several areas of the state.
- It's now the law for vendors to provide a recycling program at all public events.
- Do you have recycling at public events in your jurisdiction? If not, it may be required by law.

Ecology's message to vendors, event coordinators, event facilities includes:

- It's now the law for vendors to provide recycling at all public events in several areas of the state.
- If you sell beverages in cans or bottles at pubic events, you must provide recycling for those containers.

Ecology will conduct an outreach campaign to increase the awareness of the public event recycling requirements so that event recycling increases statewide as a result of the law. Ecology will provide a best management practices document that can be used as a stand-alone outreach piece for years to come.

# Chapter II
# Partnering for the Environment

Building strong partnerships underlies the success of Ecology's Solid Waste and Financial Assistance Program (SWFAP). SWFAP 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 are able to offer their unique perspectives and resources to move toward an economically and environmentally vibrant future in Washington.

## Beyond Waste Encourages Partnerships

We continue to carry out the priority actions outlined in the *Beyond Waste Plan*, the state's comprehensive solid and hazardous waste plan. The plan outlines an aggressive set of actions that must be taken in the short-term to make progress toward the long-term vision for our state. It includes seven categories of actions, containing a total of 64 recommendations.

The *Beyond Waste Plan*[4] is both visionary and practical. Moving *beyond waste* involves a fundamental shift from managing wastes, to preventing them from being generated.

> **The Beyond Waste Vision:**
>
> *We can transition to a society where waste is viewed as inefficient, and where most wastes and toxic substances have been eliminated. This will contribute to economic, social and environmental vitality.*

Recognizing that many waste streams will not be entirely eliminated, the *Beyond Waste Plan* challenges Washington residents and businesses to view unavoidable wastes as resources, moving them into closed-loop recycling system as opposed to simply disposing of them.

The past year, through effective collaborative efforts among citizens, businesses and not-for-profit organizations, has seen tremendous movement toward achieving many of the 5-year milestones outlined in the plan. Highlights of the *Beyond Waste* activities are listed below with details in the chapter that follows:

- Financial assistance.
- Green building.
- Recycling and beneficial use of organic materials.
- Reducing threats from small-volume hazardous wastes and products.

[4] More information about *Beyond Waste* is available at www.ecy.wa.gov/beyondwaste/.

- Environmentally preferable purchasing.
- Measuring performance.
- Cleaning up tires.
- Local solid waste and hazardous waste plans.
- Outreach, assistance and information sharing.

# Partnering for the Environment through Financial Assistance

## Coordinated Prevention Grants (CPG)

### *Purpose*

Coordinated Prevention Grants (CPG) are funded by the Local Toxics Control Account (LTCA).[5] The CPG program is administered by Ecology 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 and improve grant administration.
- Promote regional solutions and cooperation between governments.

The 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.

### *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 the 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 cities that coordinate with counties are eligible to ask for and may receive funding up to the per capita

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

allocation for their city. The availability and amount of funding depends upon legislative appropriations to the LTCA.

## *Awards*

The Coordinated Prevention Grant program awards funds in two cycles, regular and off-set:

- **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.

- **Off-Set Cycle:**
  Funds for the off-set 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). Ecology awards off-set cycle funds through a competitive process.

***For the 2006-07 grant cycle (January 2006 – December 2007)***, $10.2 million was initially appropriated plus an additional $4 million through a special legislative appropriation called the *Beyond Waste* Proviso. A supplemental appropriation for $8 million from the legislature brought the program back to prior cycle funding levels received in previous biennia.

Ecology awarded 119 grants to Washington counties, cities, and JHDs totaling $17,386,415 during the regular cycle and 56 grants for 81 projects totaling $4,530,203 during the off-set cycle. The grant funds were distributed as follows:

| | **Regular Cycle (1/1/06-12/31/07)** | **Off-set Cycle 1/1/07-12/31/08)** |
|---|---|---|
| Organics | $ 1,174,114 | $ 1,540,589 |
| Green Building | $ 77,250 | $ 92,750 |
| Residential Waste Reduction/Recycling | $ 3,798,918 | $ 523,307 |
| Commercial Waste Reduction/Recycling | $ 922,948 | $ 332,965 |
| Solid Waste Enforcement | $ 2,994,429 | $ 233,500 |
| Moderate Risk Waste | $ 7,954,282 | $ 1,611,092 |
| Other | $ 464,474 | $ 196,000 |
| **LTCA Funds** | **$ 17,386,415** | **$ 4,530,203** |
| **Total LTCA Funds** | **$ 21,916,618** | |

## *Local Government Efforts Implementing Beyond Waste Vision Using CPG Funds*

Local governments are carrying out programs that support the *Beyond Waste* vision. Examples of a number of projects are described in the Green Building, Recycling of Organics, and Reducing Threats from Small-Volume Hazardous Wastes section of this chapter. Other types of projects typically funded by CPG funds are described below.

SWFAP has developed a web-based "Washington State Information Clearinghouse". This site, to be accessible to the general public in 2008, will contain project descriptions of many local government activities, many of them funded by CPG grants. Grant reporting will be required via the Clearinghouse in the future. Additional information about the counties will also be available, as well as statewide rollups of information.

**Waste Reduction and Recycling:**
Local governments provide residential and commercial recycling, technical help to businesses, recycling collection events, education programs, on-site waste audits, and recycling drop off locations. These activities help raise Washington's recycling rate. Some examples are:

> Walla Walla County Regional Planning and Columbia County used CPG funds to conduct their "Green Seal" recognition program for businesses. They provide technical assistance and recognition to encourage businesses to reduce and recycle their waste.
>
> King County Solid Waste Division started a new project called EcoDeals and launched a Web site to market recycled content and other environmentally preferable products to consumers through electronic coupons that can be downloaded and used at selected retail stores in the region, as well as through Internet purchasing.

**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. Communities updating their management plans for solid or hazardous waste include:

> **Solid waste management plans:**
> Chelan County, Adams County, Grant County, Spokane County, Island County, Clallam County, and Pierce County.
>
> **Hazardous waste management plans:**
> Yakima County, Thurston County, and Tacoma-Pierce County.

**Solid Waste Enforcement:**
Local governments enforce the solid waste laws and local ordinances. They enforce these by permitting and inspecting facilities, by responding to complaints about illegal dumping and improper waste handling or storage, and issuing citations.

### *Future of the CPG Program*

Solid waste generation continues to rise. Washington State's Solid Waste Management plan, *Beyond Waste*, identifies strategies to reduce waste and use waste as a resource. Funding for local governments is a key component in carrying out the *Beyond Waste* strategies.

For the next grant cycle (2008-09) beginning January 1, 2008, the legislature appropriated $25.5 million dollars:

- $19.5 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.
- $4.0 million is provided for grants to fund new organics composting and conversion, green building, and moderate risk waste initiatives described in the state's *Beyond Waste Plan*.
- Up to $2.0 million of the appropriation may be used for grants to local governments to provide alternatives to backyard burning of organic materials. This will assist local communities that are impacted by the ban of outdoor burning imposed through *Washington's Clean Air Act (RCW 70.94.743*).

## 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. These grants support projects that help people educate each other and work together to solve solid waste and hazardous waste problems. These grants make it easier for people (groups of three or more unrelated individuals or not-for-profit public interest organizations) to be involved in waste grant issues. The goals for the PPG Program are:

- Increase the public's involvement in the cleanup and restoration of contaminated sites.
- Fund environmental education projects that emphasize eliminating waste and preventing pollution.
- Carry out projects that promote state solid waste or hazardous waste management priorities.

With the unanticipated increase in funding for this grant period, the PPG will increase public involvement on projects related to the following:

- Protecting Puget Sound. A portion of available funds has been set aside solely for projects that help reach the goal of a healthy, sustainable Puget Sound.
- Commencement Bay, Duwamish River and Spokane River Cleanups.
- Persistent Bioaccumulative Toxins (PBTs) (mercury, lead, some flame-retardants).
- Help put into action the state's newly revised Solid and Hazardous Waste Management Plan, known as the *Beyond Waste Plan*.

Public Participation Grant projects motivate people to change their behavior and take action improving the environment. These projects create awareness of the causes and the costs of pollution. They provide strategies and methods for solving environmental problems. This highly competitive program applies strict criteria to applications, awarding grants to projects that prevent pollution and produce measurable benefits to the environment.

## Awards

The PPG program writes grants for either one or two years. All Hazardous Substance Release Site grants are automatically written for the biennium (2 years). The Pollution Prevention Education/Technical Assistance grants may be written for one or two years. The most a grant recipient may receive for a one-year grant is $60,000; a two-year grant recipient may receive up to $120,000.

Since 1989, Ecology has given almost $6.5 million in Public Participation Grants to support the work of not-for-profit and community groups.

For the July 1, 2005 - June 30, 2007 grant period, Ecology awarded 31 Public Participation Grants totaling $1,211,541. These funds provided fourteen (14) grants for citizen involvement in the cleanup of hazardous waste sites and sixteen (16) grants for education and activities related to carrying out solid/hazardous waste pollution prevention education and management priorities.

## Public Participation Grants Achieving Environmental Outcomes

Waste management priorities for the state identified in the *Beyond Waste Plan* are:

- Reducing the use of toxic substances.
- Decreasing waste generation.
- Increasing recycling.
- Properly managing any wastes that remain.

Several projects receiving grants during 2005-2007 are consistent with the goals of the *Beyond Waste Plan* and help create the partnerships needed to achieve the *Beyond Waste* vision in Washington State. A number of completed and current projects are highlighted in following sections of this chapter: Green Building; Recycling Organics; and Reducing Threats from Small-Volume Hazardous Wastes.

In addition, the following PPG-funded projects support other *Beyond Waste* recommendations and goals:

***Beyond Waste Initiative: Current Solid Waste System Issues*** – Projects related to strengthening the existing solid waste management system.

- **Olympic Environmental Council**
  Involve the community in the cleanup of two landfills related to the Rayonier Mill cleanup site. (This is also listed under site cleanup grants for the Rayonier Mill site. The landfill component of the grant work relates to the *Beyond Waste* initiatives.)

- **The Columbia Gorge Ecology Institute**
  Promote solid waste education, community sustainability and natural resource stewardship by using "The SECRETS" program in classrooms.
- **Methow Recycles**
  Expand recycling participation with Methow Recycles by educating businesses and residents about their recycling options and offer new avenues for recycling.
- **South Sound Services**
  Reach senior and disabled populations not currently reached by waste reduction and recycling education efforts.

***Other Sustainability Focused Pollution Prevention / Education Projects***

- **Northwest Renewable Energy Festival**
  Establish the Sustainability Resource Center providing free information, education and workshops. Holding an annual festival demonstrating emerging technologies to reduce waste and preserve resources.
- **Environmental Information Cooperative**
  Train educators in special stream pollution identification and pollution prevention for inclusion in curriculum. Bring new information into classroom curriculum, expanding to 6 schools and 17 classes.
- **WA Childcare Resource & Referral Network**
  Provide outreach and education to childcare providers in the Safe Soil Program about the hazardous outfall materials from the Tacoma Smelter.
- **Far West Agribusiness Association**
  Increase pesticide container recycling by educating commercial pesticide users how to properly handle and recycle the containers.

## *Citizen Involvement in Hazardous Waste Site Cleanups*

- **The Lands Council**
  Educate low-income families (Eastern European, Asian, and Tribal communities) and the public about possible health risk factors associated with exposure to contaminants on beaches and fishing waters of the Spokane River.
- **Lake Roosevelt Forum**
  Provide meetings, workshops, conferences and tours for citizens around Lake Roosevelt, increasing their understanding of the remedial investigation and feasibility study being conducted by USEPA.
- **People for Puget Sound**
  Continue education outreach and encourage citizen involvement of the Duwamish River neighborhoods in the progress of the river's cleanup.
- **Olympic Environmental Council**
  Continue to educate Port Angeles residents about the Rayonier Mill cleanup process and two associated landfills, and encourages their involvement in voicing community values to be incorporated into the final cleanup decisions.

- **WA Physicians for Social Responsibility**
  Provide the public educational tools that explain the human/environmental history of Hanford and the challenging cleanup of radioactive waste. Encourage citizens to participation in the Hanford cleanup decisions.
- **Citizens for a Healthy Bay**
  Protecting the post-Superfund health of Commencement Bay, surrounding waters and habitat through education, hands-on citizen and school involvement and by initiating sustainable practices.
- **Pacific Rivers Information Network (PRIN)**
  Provide information about the Hanford Tank cleanup activities with interested organizations and schools to encourage public interest and support. Will take a traveling road show to schools and develop new learning packages for school districts.
- **Brackett's Landing Foundation**
  Monitor the progress of the cleanup on the UNOCAL site. Educate the community about the status and progress of the UNOCAL cleanup site.
- **Georgetown Community Council**
  Provide informational meetings/workshops for the community about the Phillip Services Corporation site cleanup.
- **Columbia Riverkeeper**
  Educate and motivate the public to be active participants in the Hanford cleanup. Focusing on risk assessments for the River Corridor and the 200 area, appropriate cleanup for the 300 area, waste sites assured to have comprehensive assessments on waste streams, and tracking the tank waste EIS to assure protection of groundwater and the Columbia River.
- **Skykomish Environmental Coalition**
  Continue to provide information to the community and encouraging their involvement in decision-making processes to cleanup the old BN/SF refueling/maintenance site in Skykomish. Excavation of the Levee Area and the river will be the first steps in the cleanup of the site.
- **Heart of America**
  Assure the public their values are incorporated into the decision-making process for the Hanford site cleanup.
- **Center for Justice**
  Engage the community in the Spokane River cleanup by using the media to focus attention on the river cleanup.
- **Bellingham Bay Foundation**
  Provide education/outreach to the community on the progress of the cleanup of Whatcom Creek.

# Partnering for the Environment through Sustainable "Green" Building

The goal of the Green Building Initiative in the *Beyond Waste Plan* is to dramatically increase building practices less toxic to environmental and human health. The long term goal of the Green Building initiative is for green building to become standard building practice in Washington.

Ecology's Beyond Waste Green Building Indicator[6], identified that 6.7% of new residential and commercial construction starts in 2005 were certified through either the Built Green™ (residential)[7] or LEED® (commercial)[8] green building certification programs. This figure will rise significantly over the next several years as state projects, that are now required by law to be built to specific green standards, begin construction.

Washington was the first state in the country to require green buildings for the public sector. The 2005 High-Performance Public Buildings legislation requires that all new buildings receiving public funding be built to one of three green building standards, based on building type.[9]

- New state buildings will be constructed to the Leadership in Energy and Environmental Design (LEED®) Silver Standard after July 1, 2006.
- New public schools will be constructed to either the LEED Silver Standard or the Washington Sustainable Schools Protocol after July 1, 2007.
- All affordable housing projects receiving funding through the Housing Trust Fund be built to the Evergreen Standard for Affordable Housing.

To ensure the legislation is fully implemented and to encourage continued growth in green residential construction, Ecology will collaborate with and provide resources to others: local and county governments, non-profits, trade organizations, the business community, builders and developers, and citizen groups, as well as Ecology staff in other programs. Below are some of the projects underway.

## Public Sector and Commercial Green Building Activities

### *Eco-Charrette Facilitation Services*

One of the differences between building 'the usual way' and a key to building sustainably is holding one, or a series of, meetings at the very beginning of every building project. Known variously as a *charrette*, or an *eco-charrette, or an integrated design workshop*[10], the charrette is

[6] Ecology's Beyond Waste Green Building Indicator describes the market share of green building in Washington State.

[7] Built Green has a number of chapters in Washington that offer self-certified and third-party verified checklist programs. See www.builtgreenwashington.org for details.

[8] LEED offers a suite of third-party-verified checklists tailored for specific types of commercial and large residential developments. The U.S. Green Building Council, headquartered in Washington, D.C., runs this program.

[9] RCW 39.35

[10] French for "cart." The term refers to the conveyance that, on their exam day, collected the 19th century Parisian architecture students and their final projects. On the way to l'Ecole des Beaux Arts, they would active critique and

an interactive brainstorming session that generates key goals for a green building project. Those participating explore many sustainable and high performance strategies, and evaluate approaches that can be applied to the project by the design team while meeting the building owner's needs.

Usually a full-day facilitated workshop, the charrette often involves community members, building owners and users, facility staff and building design professionals. Charrettes have proven instrumental in avoiding costly mistakes and producing better and more satisfactory buildings. SWFAP's Green Building Group began offering eco-charrette (or integrated design workshop) facilitation services in 2007, for construction projects that must comply with the state's green building mandate.

Since starting this service, the Green Building Group has facilitated eco-charrettes for the Northeast Community Center Association and for the Department of Corrections Airway Heights facility.

Participants in the Northeast Community Center Association Charrette discuss green strategies for the project.

## *"Build-It-LEED for Contractors" Training*

O'Brien & Company, a green building consulting firm in Seattle that developed the "Build-It-LEED for Contractors" training with Cascadia Region Green Building Council (Cascadia GBC) agreed to train SWFAP's Green Building Group and General Administration's Green Building Advisor to conduct their training at no cost for contractors working on public projects. Since then, Ecology and GA green building staff have trained over 60 state project managers, contractors, and subcontractors, involved with numerous community college and university projects. State project managers are beginning to view the course as so essential to the success of their projects that they plan on requiring all contractors hired for public projects take the training before beginning construction.

## *Green School Construction in Washington*

The Washington Sustainable School Protocol (WSSP), effective in 2007, requires that new schools use methods that increase energy efficiency and water conservation, and use materials that

assist each other to make their projects more successful. Integrated design is skillful thinking about all the building systems from many viewpoints which results in a healthier, more durable structure that saves energy and water.

have low-toxicity and contain recycled materials. The schools must provide natural light and fresh air for the students, and minimize waste during construction. Four schools have been successfully built to the standard, in a volunteer pilot program. While the legislation only applies to schools that receive state funding, many school districts that are not required to - are choosing to build their schools to the standard. An estimated 19 more are currently under construction across the state.

Washington Middle School, a WSSP school in Olympia, WA

*High-performance Schools Video*
To alert school districts to the new requirements, Ecology joined with the Office of the Superintendent of Public Instruction (OSPI), Educational Service District 101, and BetterBricks to produce an informational DVD. Copies have been sent to all 295 school and educational service districts in Washington. The video can be viewed at OSPI's High-Performance Schools Program website: http://www.k12.wa.us/SchFacilities/HighPerformanceSchoolBuildings.aspx

### *Construction and Demolition Waste Reduction and Recycling Projects - Award for Fort Lewis Deconstruction*

Ft. Lewis and the Army Corps of Engineers received a "Recycler of the Year" Award from the Washington State Recycling Association (WSRA). Mechanically-assisted deconstruction techniques were used to remove World War II-era barracks buildings, while salvaging or recycling 100 percent of non-hazardous materials from the project. The success of such large-scale deconstruction projects can help make salvaged and reused building materials more available to consumers.

## Public Sector and Residential Green Building Activities

### *Community, Trade and Economic Development (CTED): The Evergreen Standard for Affordable Housing*

Ecology staff worked with CTED's "Green Team" to ensure that the Evergreen Standard for Affordable Housing encouraged the highest level of construction waste reduction and recycling. This partnership resulted in the waste reduction requirement moving from 50% to 75%.

Entry to Street of Dreams with the 5-Star Built Green CMI home

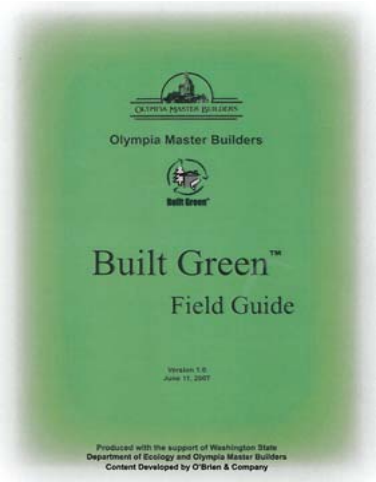
### *Built Green Washington (BGWA) and Built GreenTM Chapters*

Built Green™ Washington (www.builtgreenwashington.org) started in 2005. Its mission is to direct home builders and home buyers to Cooperative members, so they can get the information

needed to build and buy green. In May 2007, the Green Building Group held the first state-wide forum to encourage green building in eastern Washington.

**BuiltGreen of King/Snohomish Counties*
This Chapter certified its 11,600th home in its area and the first 5-Star home in Suncadia Resort, Roselyn. In March, it received national recognition as 'The Green Building Chapter of the Year' from the National Association of Home Builders. In July, all five homes in the Seattle Street of Dreams earned certification – a first for this 24-year show.

**BuiltGreen Olympia*




Covering five counties in Southwest Washington: Mason, Grays Harbor, Pacific, Lewis and Thurston, this chapter completed the Built Green Field Guide (funded by PPG). The Field Guide is a sturdy, waterproof guide with schematic drawings and concise how-to's helping builders implement cost-effective green building techniques on their current projects. The guide allows builders to tie changes in practices or new techniques to points on the Built Green checklist, encouraging those builders currently building to code to incorporate green building techniques and reach higher to Star level 2 or 3 of Built Green certification. Also, for the first time, the Olympia Master Builders featured six Built Green homes in their 2007 Tour of Homes.

**BuiltGreen Clallam*
This new chapter is organizing green building training for high-school and community college students and hands-on experience for them building a Built Green model home through the Future Builders Program. They also plan an online database for local green products, materials, and suppliers and will offer a five part Built Green and Low-Impact Development (LID) workshop series.

*BuiltGreen Inland Chapter*
The Inland Empire BuiltGreen program is currently under development, with pilot projects underway in the summer of 2007. The initial program launch is set for the autumn of 2007, during the Spokane Fall Festival of Homes. The Spokane Home Builders Association plans to have the complete slate of residential programs (single family, remodel, communities, & multi-family) available for the spring 2008 building push.

**Central Washington Home Builders (CWHB) Built Green*
This new Built Green chapter chose to use the National Association of Home Builders' checklist draft as their base, since it fits their largely rural character. CWHB Built Green already has builders ready to certify homes once the checklist is completed.

## *Northwest EcoBuilding Guild*

*Regional Guild*
The Northwest EcoBuilding Guild has come forward with a strong statement of intent to focus its work over the next several years on projects geared at educating home builders on climate friendly practices.

*South Sound Chapter*
The South Sound Chapter has seen tremendous growth over the past year, from 12 members in 2006, to over 85 members in 2007. Monthly meetings cover topics ranging from green technologies for application in homes to on-site recycling programs.

*Inland Branch*
The Inland Branch, with Ecology staff, organized a series of nine lectures on green building practices targeted at residential home owners. Topics ranged from water efficient landscaping and used building materials to indoor air quality and energy efficiency for older homes.

### *Sustainable Development Task Force of Snohomish County (SDTF)*

The SDTF partnered with the City of Everett and others hosting its first Sustainable Business Conference in Fall 2006. In March, they joined with Built Green of King and Snohomish Counties to organize its annual conference in Everett. In addition to its many other public outreach activities, the Task Force is working with the County planning department to remedy the current disincentives in permitting LID and other innovative development approaches.

### *The Multiple Listing Service (MLS) Turns Green*

The Northwest Multiple Listing Service, a clearinghouse for all homes for sale in Washington, voted to add checkboxes for green certifications (Built Green™, LEED®, Energy Star®, etc.) to its listings. It is now much easier to identify – both for sale and purchase – these healthier, more durable, and energy-efficient homes.

## Other Green Building Outreach Activities

### *Rainwater Collection Focus Sheet Complete*

Green building certification systems, such as LEED, encourage rainwater collection as a strategy to conserve water generally and reduce use of potable water for landscaping, flushing, and other non-potable uses. SWFAP's Green Building Group, working with Water Resources staff and Public Information Officers, produced "Ecology Focus on Rainwater Collection and Water Rights Permitting", which clarifies Ecology's legal obligations to protect the State's water resources, while recognizing the key benefits of rainwater harvesting.

### *The Sustainable Building Advisor (SBA) Program*

Now offered in community colleges in four states, the Seattle-based Sustainable Building Advisor program is a nine-month professional certification course that prepares its graduates to address the range of sustainable building priorities and choices.

## Grant –Funded Projects Support the Beyond Waste Goal of Increasing Green Building

The projects listed below have received either Coordinated Prevention Grant (CPG) funding or Public Participation grant (PPG) funding:

- **City of Tacoma – CPG Funding**
  This project used CPG funds to support its EnviroHouse. This display shows green building products and ideas to residents of Pierce, Kitsap, south King, and north Thurston counties. It promotes residential green building and natural yard care.
- **Kitsap County Public Works – CPG Funding**
  This project paid for a consultant to help with construction of the Kitsap Community Resources building. This consultant worked with construction project managers, and their architects, and contractors to ensure the use of specified materials is properly documented. The consultant will assemble the documentation and submit it to the US Green Building Council to obtain Leadership in Energy and Environmental Design (LEED) certification for the building and prepare a case study.
- **Economic Development Council of Snohomish County for Sustainable Development Task Force – PPG funding**
  The purpose is to educate communities, builders, developers and governing bodies about the benefits of sustainable building and assist in the development of a plan that promotes sustainable planning, design and construction.
- **Olympia Master Builders – PPG funding**
  The purpose is to promote construction using resource-efficient building practices and to educate builders on how to reduce construction waste, use energy-efficient building materials and encourage participation in the Built Green program.

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

In 2005, the Solid Waste and Financial Assistance Program (SW&FAP) began carrying out one of the priority *Beyond Waste* initiatives - to expand and strengthen the closed-loop reuse and recycling system in Washington for organic materials. There are ten 5-year Organic Initiative milestones that move us towards the State's 30-year Beyond Waste goal. Ecology and local government, other state agencies and community members will work together to accomplish the milestones by November 2009.

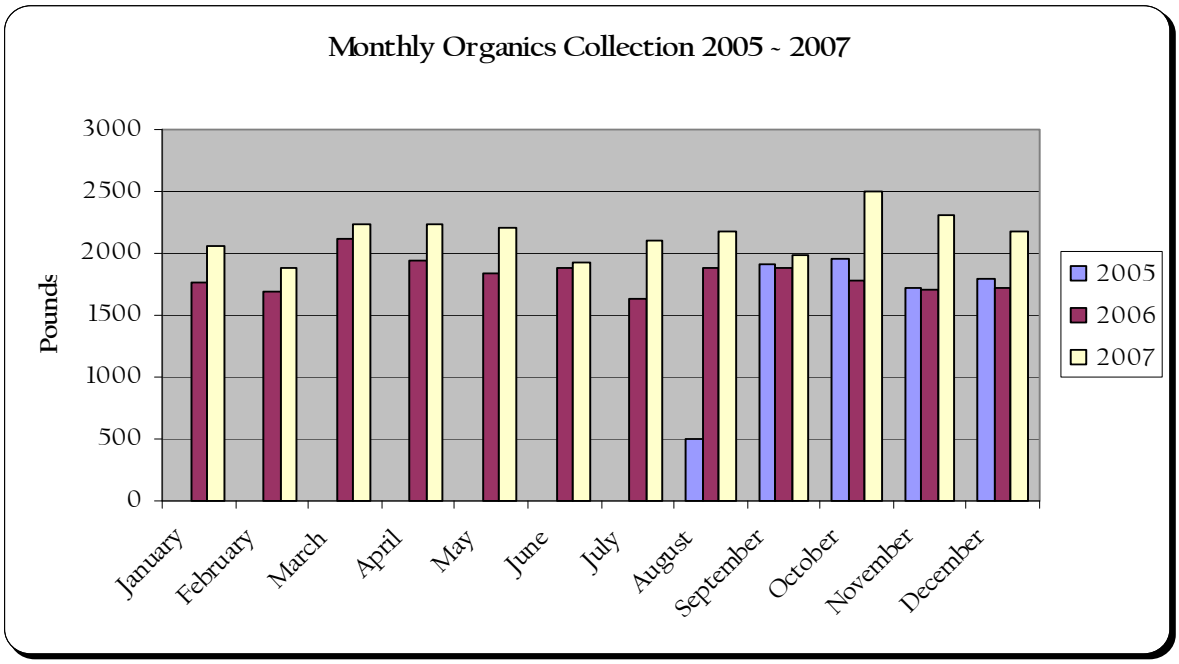
## Meeting Milestones and Making Progress

Of the ten 5-year milestones in the Beyond Waste Organic Initiative, two have been met.

*State government and other large institutions use the organics recycling project at Ecology's headquarters in Lacey as a model.*

Ecology has successfully operated an on-site Compost Center at the Head Quarters/Southwest Regional Office in Lacey, since August 2005. Between August 2006 and August 2007, over **25,000 pounds** of food waste were collected and processed into a high quality compost product.

**Table 2.1**
**Monthly Organics Collection 2005 - 2007**




Since the composting program began in August 2005, over 55,390 pounds of food scraps and paper towels have been diverted from the landfill.

Tours of the Compost Center provide inspiration for other facilities. And based on Ecology's food scrap management model, other agencies and schools have developed similar programs.

*Several pilot projects are in place around Washington, demonstrating anaerobic digestion technology.*

Washington State University's anaerobic digester.

At Washington State University in Pullman, a small digester has been operating with the plan to experiment with different feedstocks. Also, a digester in Whatcom County is running using dairy manure and food scraps for feedstocks. Research taking place at both of these facilities is leading to an increasing interest in siting anaerobic digesters around the state.

Three additional milestones are on track to meet the 5-year deadline.

*Best management practices are in place for organics management at least six institutions and agencies around the state.*

After a renewed effort to fulfill agency sustainability plans, several state agencies called for a tour of Ecology's Earth

Tub composting center. In the last year, this has resulted in one state agency collecting veggie scraps and coffee grounds for a worm bin. Also three Thurston County Elementary Schools have installed Earth Tubs to compost food scraps collected at meal times. Cowlitz County has committed to helping Kelso High School begin composting in Earth Tubs.

The Stafford Creek Corrections Center in Grays Harbor County started composting with a large vermicomposting bin. They are truly closing the organics loop as the compost they make from their food scraps, is used to grow more food.

With the current momentum, we should easily meet our target of six agencies and institutions using best management practices to manage organics by 2009.

*Home composting programs active and successful in every county.*

This milestone is a work in progress. In October 2006, a Compost Educators' Workshop was held in Ellensburg. We continue to build on that foundation with outreach to participants and compost educators around the state. Currently, a "master" compost educators' guide is being developed in partnership with Washington State University Research Extension Service in Puyallup. This guide will provide a consistent, science based resource for compost educators around the state.

2006 Compost Educators' Workshop

*Most people throughout the state are aware of the ongoing "healthy soils" program and a significant portion of the people understand the benefit of healthy soils.*

Ecology continues to seek partners to develop and promote a healthy soils campaign. We have made headway through funding events, presenting at workshops and writing articles for numerous publications. Ecology's Public Participation Grant program will also fund work on the healthy soils program.

The remaining milestones need continuing support and additional effort to be achieved by November 2009.

*Closed-loop organics recycling goals and actions have been incorporated into several local-jurisdiction solid waste management plans.*

Several solid waste management plans include language that supports some of the *Beyond Waste* Organics Initiative goals. State and local planners can do more to help local jurisdictions add stronger, closed-loop organics management language to their plans.

*Effective incentive for encouraging organics closed-loop recycling have been identified and pursued.*

The Washington Organic Recycling Council (WORC) created a standing *Beyond Waste* Committee to identify barriers and incentives to closing the loop on organics recycling. The Committee surveyed WORC members in June 2006, to find out if the current barriers and incentives mirrored the barriers and incentives identified in 2004. The Committee discovered significant similarities. Next steps include linking specific regulatory barriers with the survey results, creating a list of regulatory fixes and identifying prioritized list of incentives to encourage closed-loop organics recycling.

*Performance-based product labeling requirements are in place for organic products that are sold or given away.*

Building consumer confidence and product quality drove the development of this milestone. However, moving this milestone forward depends on resources, (FTE's, partners, research, etc.).

*Implementation of an agreed upon strategy for increasing agricultural and industrial organics recycling is under way. A plan to address statutory and regulatory barriers to closed-loop organics recycling is widely supported.*

Building a strategy with partners from the agricultural and research community is instrumental to a widely supported plan to address regulatory and statutory barriers. But as technologies change rapidly for processing agricultural organic residuals, so must the strategy change. The next step for Ecology is to create a strategy that internal organics and *Beyond Waste* specialists support taking to a stakeholder group for further refining.

## Grant–Funded Projects Support the Beyond Waste Goal of Increasing Residential and Commercial Organics Recovery Programs

The projects listed below are receiving Coordinated Prevention Grant (CPG) funding:

**Whitman County Public Works – CPG funding**
This project provided residents with a free yard waste disposal program. Staff at the disposal site chip the yard waste two or three times a year.

**The City of Issaquah – CPG funding**
This project developed and implemented a community outreach strategy including incentives to increase participation in the city's curbside food and yard waste recycling program combined with direct outreach to Issaquah residents. They designed and tested the use of a promotional "foodwaste recycling incentive kit" involving compostable bags, kitchen containers and educational or other similar materials. At least one other community in King County is now using this project as a model for their start-up program.

**Lewis County Community Development – CPG funding**
Lewis County partnered with the local WSU Extension office and Master Recycler Composter program. The partnership works with volunteers to provide community outreach and education. They will assist with workshops, a Christmas tree recycling program, and maintenance of a compost demonstration site.

## Commercial Composting

Ecology views commercial composting as a key element in the closed-loop organics recycling system. To build consumer confidence, the compost facilities which 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 while protecting human and environmental health.

In 2006, thirty-three commercial facilities reported over **one million tons** of organics were processed into over **900,000 cubic yards** of compost. (See http://www.ecy.wa.gov/programs/swfa/solidwastedata/ for the facilities reporting composting activities in calendar year 2006.)

Composting facilities are regulated under *chapter 173-350 WAC, Solid Waste Handling*

*Standards (WAC 173-350-220, Composting Facility Standards*). The composting standards include design and operating requirements for permitted facilities. In addition, testing criteria must be met in order for the final product to be considered "composted material". *WAC 173-350-220, Composting Facility Standards*, also offer several categories of composting activities which are exempt from solid waste permit requirements. The exemption categories were designed to "promote composting while protecting human health and the environment."

Ecology works with Washington State University Cooperative Extension researchers, consultants, and local governments to educate potential composters about the new opportunities and their responsibility to use best practices when composting even small volumes of material.

We also are partnering with Washington Department of Transportation promoting compost use for erosion control and stormwater management.

## Compost Facility Operator Training

Ecology believes Compost Facility Operator Training (CFOT) is *essential* to a successful composting industry. In October 2007, Ecology helped the Washington Organic Recycling Council conduct its annual CFOT program at WSU in Puyallup. The program featured a 5-day format that includes lectures, fieldwork and field trips. This training provides a solid foundation of knowledge to help build efficient, compliant compost facilities. For the first time this year, CFOT students toured Ecology's (Lacey, WA) Compost Center. Additional training on the value of compost helps build a critical mass of people who understand the importance of compost end-use in protecting the environment.

We had a nice mix of public and private sector professionals, including folks from Hawaii, Wisconsin and from Oregon DEQ getting ahead of the composting curve in anticipation of the new DEQ compost regulations.

In addition to volumes of knowledge taken home by the students, CFOT offers students the invaluable opportunity to network and gain perspective from each other, regarding operation and regulation of compost facilities in Washington.

Instructors, Jeff Gage and Andy Bary build an "aerated static" compost pile.

Students proudly display their own their own compost pile.

## Waste to Fuels Technology

The 2006 legislature directed Ecology SWFAP and Washington State University (WSU) to establish a partnership to conduct research on Waste to Fuels Technology. An Interagency Agreement was signed in late 2006 to conduct work on two projects:

- **Biomass Inventory Technology and Economics Assessments.**
- **High Solids Municipal Digester**

Work began on these projects in the later half of 2006. The legislature approved continued funding for project completion by June 2009.

The **Biomass Inventory Technology and Economics Assessment** has three main goals. These are as follows:

- Evaluate the attributes and chemical characteristics of the 44 waste types set forth in the statewide biomass inventory.
- Identify three main technology approaches to recover renewable fuels, energy or products from the waste materials.
- Conduct an economics assessment and provide transportation cost curves for delivery of the materials to a processing location.

The **High Solids Municipal Digester** project's goal is to produce energy and fertilizer from organic municipal solid waste. The project will conduct both laboratory investigations and utilize software engineering programs to create a model design for anaerobic digestion of high solids municipal organic waste.

WSU Biological Systems Engineering Department is completing the work on these projects. End of first year project reports are complete and are available on the Ecology website on the following links.

- Biomass Inventory Technology and Economics Assessment -- Report 1. Characteristics of Biomass, Ecology No. 07-07-025. http://www.ecy.wa.gov/biblio/0707025.html
- Producing Energy and Fertilizer From Organic Municipal Solid Waste -- Project Deliverable #1, Ecology. 07-07-024. http://www.ecy.wa.gov/biblio/0707024.html

A library of previous work on biomass from around the state of Washington and the region is available at: http://www.pacificbiomass.org/

## Organic Waste to Resources

The 2007-2009 Budget funded Ecology to conduct research and complete pilot and other demonstration projects in Organic Waste to Resource recovery. The intent is to conduct fundamental and applied research that will ultimately stimulate development of alternatives uses, energy recovery and product development to move organics from waste to sustainable uses. Organic Waste to Resources provided funding to the WSU Extension Energy Program to assist in further developing markets and organic resource demand strategies to move waste from the solid waste management system to be used as resources for the development of fuel, energy and products.

Ecology established an Interagency Agreement with WSU Extension Energy Program to build demand support for renewable energy and fuels and encourage broad adoption of sustainability principles that are embodied in the *Beyond Waste Plan*. Ecology and WSU Energy Extension staff are working closely together to support recovery of organic waste for fuels, energy and products.

In addition, Research and Pilot projects under this source of funds were made available through Request for Proposals. The goal of the RFP's was to take next steps in the *Beyond Waste Plan*, Organics Recovery project by creating sustainable closed-loop beneficial uses throughout Washington.

> "The Beyond Waste vision does not focus just on environmental protection. Rather, the vision calls for the elimination of waste within a framework of "economic, social and environmental vitality" (*Beyond Waste Plan*, 2004: http://www.ecy.wa.gov/beyondwaste/).

This *Beyond Waste* vision incorporates sustainable, closed-loop full cycle uses of organic materials produced across Washington's economy. The objectives of the pilot, demonstration and outreach RFP funding were to:

- Build pilot projects that demonstrate and expand organic recovery and reuse.
- Provide equipment and resources to improve education for organic recovery and processing methods.
- Create forums for public and scientific discussion on organic recovery, and reuse solutions for fuels, energy and products.

- Produce and implement materials and methods for education on organic recovery and reuse.

The objectives of this research funding were as follows:

- Produce renewable fuels to help replace current fossil fuels.
- Create carbon neutral and carbon negative solutions for fuels, energy and products.
- Recover valuable industrial and agricultural nutrients in process technologies.
- Support durable, secure systems through distributed production.
- Create sustainable economic vitality, social equity and environmental balance.
- Produce transferable research and technology that can be replicated around the state.

Ecology established a multi-agency RFP review team to evaluate the proposed projects. Two pilot projects were selected for contracting and 6 research projects were also selected. Currently, contracts and scopes of work are under development on these projects. All projects must be complete by June, 2009. An update will be provided on each project in next annual report.

# Biosolids

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 the 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 to be "biosolids" and is regulated as a commodity, not as a solid waste. The statute further directs that biosolids be beneficially recycled to the maximum extent possible. We strongly encourage all producers of biosolids to pursue beneficial use.

Total production of biosolids within the state in 2006, was approximately 103,000 dry tons. Of this amount, about 86% was land applied, about 14% was incinerated, and less than 1% was landfilled. Among the biosolids land applied, about 70% was applied to agricultural land.

## *Permit Program*

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 departments (JHDs), carry out the state biosolids program.

The state biosolids rule was revised in 2007, and went into effect on June 24, 2007 (see below for a further discussion). The current biosolids general permit went into effect on June 5, 2005, and will expire June 5, 2010.

The biosolids general permit governs the quality of biosolids applied to the land or transferred to other facilities, and the 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 that are applied to areas where access and crop harvest restrictions can be put in place.

There are 374 facilities that are required to be covered under the biosolids general permit. The permit applies to all "treatment works treating domestic sewage" that:

- Prepare biosolids for beneficial use.
- Apply biosolids to the land.
- Transfer biosolids or sewage sludge to or from another facility.
- Dispose of biosolids or sewage sludge in a municipal solid waste landfill.

The majority of affected facilities are publicly owned wastewater treatment plants, privately owned wastewater treatment plants that treat only domestic sewage, and similar state and federal facilities (military bases, prisons, parks, etc.). Other types of facilities that are required to seek coverage under the biosolids general permit are: certain composting facilities that treat biosolids as a feedstock, biosolids beneficial use facilities (land appliers who obtain a permit to reduce the permitting requirements for their clients), and septage management facilities (treat or land apply septic tank materials).

Coverage under the general permit is provided in two phases:

1. Provisional approval, and
2. Final approval

"Provisional" approval is obtained by a facility submitting a *Notice of Intent* and a complete *Application for Coverage* as provided in the rule and general permit. Under provisional approval, a facility is authorized to carry out biosolids management activities according to the conditions of the 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 Ecology review of the permit application and operating practices. In issuing final approval, we may impose "additional or more stringent" conditions necessary to ensure proper biosolids management. Any such conditions are subject to appeal.

By streamlining the permitting process through changes to the biosolids rule and the general permit and making a greater effort towards getting the necessary information from all permittees, we expected that the rate of final approvals provided during the current permit cycle would be much greater than that during the first permit cycle. This has been shown to be the case. During the 7 years under the first general permit cycle, only 85 final approvals were granted. However, during the 2 years since the revised general permit was issued, Ecology has issued 137 final approvals.

## *Delegation to Local Jurisdictions Health Departments (JHDs)*

A total of 11 JHDs have accepted some degree of delegation for carrying out the state biosolids program. Each of those JHDs has entered into a formal *Memorandum of Agreement* with Ecology. The delegated JHDs have actively taken the lead in conducting various aspects of the biosolids management program within their jurisdiction. Most other JHDs provide varying degrees of

assistance to Ecology. Funding and workload demands on staff continue to be the major reason given by JHDs when choosing not to pursue delegation of the biosolids program. It is expected that shortfalls in county budgets and limited staff resources will continue to be a barrier to our biosolids program delegation efforts, and it is likely that some of the current delegation agreements will expire without being renewed.

## *Rule Revision Efforts*

In June 2007, Ecology completed the process to revise the state biosolids rule with assistance from an advisory group representing interested parties across the state. The rule revisions efforts were begun in late 2005. Ecology began the rule revision process with 4 overarching goals. The overarching rule revision goals and a brief description of rule changes made to meet those goals are described below.

- **Goal: improve the permit process.**
  In order to meet this goal, the revised rule: provides exemptions from some requirements for approved research projects; allows out-of-state producers of biosolids to send biosolids to permitted in-state facilities under a simplified process; allows deferral to existing environmental permits for storage of biosolids; requires permit applications to be submitted within 90 days following the issuance of a new general permit; reduces the number of newspaper notices (when required) from 2 to 1; eliminates the need for public notice each permit cycle for facilities that do not land apply nonexceptional quality biosolids if proper notice has previously been conducted; and removes the requirement for re-posting of land application sites each permit cycle if it was properly done previously.
- **Goal: address septage management requirements.**
  In order to meet this goal, the revised rule: requires that all septage management facilities obtain a permit from Ecology; imposes the same site management and access restrictions on all septage applied to the land; and allows Ecology to impose a more stringent application rate where necessary.
- **Goal: adjust the biosolids fee structure to make is more sustainable and fair.**
  In order to meet this goal, the revised rule: imposes a $600 minimum fee on all facilities required to obtain a permit; imposes a $1,800 review fee for new facilities; increases the maximum fee for biosolids beneficial use facilities and other receiving-only facilities from $2,500 to $3,000; and provides for a reduced charge for each residential equivalent above 100,000.
- **Goal: incorporate policy changes and address "general housekeeping" issues.**
  In order to meet this goal, the revised rule: requires submittal of a spill prevention and response plan if biosolids are transported; updates the analytical methods allowed; eliminates Alternatives 3 and 4 from the Class A pathogen reduction alternatives; imposes a requirement to remove manufactured inerts by screening or an alternative method; imposes a requirement that land applied biosolids contain less than 1% of recognizable manufactured inerts; requires all biosolids sold or given away in a bag or other container to meet the exceptional quality standards; "grandfathers-in" existing surface impoundments; and imposes the *chapter 173-350 WAC, Solid Waste Handling Standards*, requirements for new or upgraded surface impoundments.

# Partnering for the Environment by Implementing the Small-Volume Hazardous Waste (aka Moderate Risk Waste (MRW) Initiative and Reducing Threats from Priority Waste Streams.

There has been significant progress on a number of recommendations and milestones related to Beyond Waste. These include the following:

- All Moderate Risk Waste (MRW) collection facilities in the state have been inspected for compliance with the current rules and either are in compliance or are on compliance schedules.
- Chemicals Policy is being examined as a possible approach to go beyond the traditional single element or one compound at a time prioritization strategy of managing problem wastes.
- Over 100 contractor or wholesaler locations are taking mercury containing thermostats under the Thermostat Recycling Corporation's (TRC) take back program. In addition, where there was one local HHW collection facility taking mercury thermostats in 2006, there were over 14 facilities offering that service to the public in 2007, due to the expansion of the TRC program to public collection centers.
- The Washington State Legislature chose to act to reduce the threats from Poly-Brominated Diethyl Ether (PBDE) containing products by banning it from the state on the following schedule:
    - Bans the use of the penta and octa forms of PBDEs, with limited exceptions, by 2008.
    - Bans the use of the deca form in mattresses by 2008.
    - Bans the use of the deca form in televisions, computers, and residential upholstered furniture by 2011, as long as a safer, reasonable, and effective alternative has been identified by the state departments of Ecology and Health and approved by fire safety officials.
- An Electronics Product Stewardship system is emerging (see discussion below). This is the result of legislation calling for a comprehensive statewide system to recover TVs, computers and monitors at no cost to the user. Rules have been developed by Ecology staff and the Materials Management and Financing Authority has formed and is developing a statewide recycling plan for covered electronics. Subsequently the Oregon legislature passed parallel laws requiring a similar system to Washington and on the same timeline of implementation. This could provide increased efficiency of scale for a regional solution to the end-of-life management for electronics in the northwest.
- The national Paint Product Stewardship Initiative continues to make progress toward the implementation of a nationally-coordinated leftover paint management system funded by the paint industry. The National Paint and Coatings Association as well as government and other stakeholders have allocated significant resources towards this during the past three years. A second MOU is being signed by stakeholders and supporting organizations. The MOU calls for the development of a sustainable industry financing system, a Paint Stewardship

Organization, a statewide demonstration project in Minnesota and subsequent roll-out of a national system beginning with Washington and Oregon in 2009.

- Environmentally Preferred Purchasing (EPP) systems and practices are being developed and promoted. A new EPP Web site has been established. A review of the navigation of the Web site has taken place. Discussions have taken place with General Administration (GA) regarding incorporation of environmentally preferable purchasing in their trade show in the fall. An interim recycled-content paint purchasing state contact has been completed and has been sent for approval at GA. The Institutionalizing Environmentally Preferable Purchasing and Tri-state Meeting were combined to discuss how best to:
    - Institutionalize environmentally preferable purchasing.
    - Collaborate on the eco-certification of products.
    - Greening the Grainger catalog.
    - Sharing of product fact sheets.
    - Continue on-going efforts to launch environmentally preferable purchasing Web site.

## Implementation of Washington's Electronic Product Recycling Law

In January 2007, Ecology began implementing *chapter 70.95N RCW, Electronic Product Recycling*, by registering manufacturers of computers, portable computers, computer monitors and televisions into the Electronic Product Recycling Program. To legally sell these products in or into the state of Washington, manufacturers must, as of January 1, 2007:

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

Great progress has been made as Washington quickly approaches January 1, 2009, when households, charities, school districts, small businesses and small governments will be able to drop-off the electronic products covered by this law for recycling at no charge. Accomplishments as of November 2007 include:

- Over 260 manufacturers have been registered with the Electronic Product Recycling Program.
- Comprehensive rules, *chapter 173-900 WAC, Electronic Product Recycling Program*, have been adopted delineating the requirements of this program for manufacturers, collectors, transporters, and processors of electronic products covered by the law (see http://www.ecy.wa.gov/programs/swfa/eproductrecycle/rulDev.html) .
- The web site developed for the Electronic Product Recycling Program continues to be augmented to provide up-to-date and detailed information for all affected parties on

registration requirements, fees, public involvement opportunities and more (see http://www.ecy.wa.gov/programs/swfa/eproductrecycle/index.html) .

Future Activities

In 2008, Ecology will be reviewing the Standard Plan for electronics recycling as well as any independent plans that may be proposed. Plan review will be focused on meeting the requirements set in rule under *WAC 173-900-320*. Ecology must approve all recycling plans prior to implementation and all plans must be fully operational on January 1, 2009.

Manufacturers will automatically be members of the Washington Materials Management and Financing Authority and participate in the Standard Plan unless Ecology approves an independent plan. The Standard Plan will be managed by a board of directors of the Authority which will be comprised of eleven large and small computer and television manufacturers. The board of directors will prepare, submit and implement the Standard Plan for the recycling of the electronic products covered by the law.

Prior to the mandatory start date for electronic product recycling plans, Ecology will be launching a statewide public information campaign. The campaign will be a cooperative effort between manufacturers, retailers, local governments and Ecology which will inform the public about where and how to reuse and recycle electronic products at the end of the product's life.

## Pharmaceuticals from Households: A Return Mechanism (PH:ARM)

Unwanted medication left in the home increase opportunities for drug abuse, diversion, and teen "pharming". Storage and improper disposal to the garbage also increases the likelihood of accidental poisonings. There is also increased concern that the method of "crush and flush" disposal contributes to the presence of pharmaceutical pollution in our streams and negatively impacts aquatic organisms.

In October 2006, a coalition of local and state governments, and non-profits, began a small pilot with Group Health Cooperative to collect waste medications from consumers. Expansion to a few other locations at Bartell Drug Company and assisted living facilities began in 2007.

There are significant security, cost, and regulatory challenges to managing this waste stream via Household Hazardous Waste programs. Additionally, 54 Moderate Risk Waste facilities cannot provide comparable geographic service to the 1,300 pharmacies in Washington. Only 2% of people surveyed were willing to use a municipal hazardous waste site to dispose of drugs, while 80%

said they'd likely return their unwanted medicines to a secure drop box at their pharmacy (SoundStats survey of King County residents, 2006).

The PH**:**ARM coalition (which includes the Washington State Board of Pharmacy, the Local Hazardous Waste Management Program in King County, Snohomish County Solid Waste Management Division, the Northwest Product Stewardship Council, Public Health- Seattle & King County, Washington Citizens for Resource Conservation, the NW Pollution Prevention Resource Center, DSHS, and the Washington State Department of Ecology) intends to create a comprehensive program (using the pilot results) that collects all types of waste medication from residents, and is funded and implemented through a product stewardship approach.

PH**:**ARM collected 2,945 lbs of medication and its packaging of medications from consumers (and counting) between October 2006-September 2007 at eleven locations in five counties. On average, 1.5 lbs a day have been collected per pharmacy. Extrapolated statewide, 600,000+ lbs of waste medication could be collected for proper disposal and kept out of the environment. (note: The team believes that the return rate in the pilot is quite high, and statewide results should be closer to 100,000 lbs annually.)

The best commercially available option for disposal is currently high-temperature incineration. The team is also supporting crucial research about upstream design issues of medicines, prescribing practices, and any alternatives to incineration.

The number of pilot sites is limited because of significant disposal costs and substantial logistical and regulatory barriers. Due to the pilot nature of the project, PH**:**ARM is unable to provide service for a large number of people across the state. If there is not a participating pharmacy nearby, an interim recommendation is to tape the medicine vial closed, wrap and obscure the package contents in another bag, and dispose of it into the garbage.

Two major barriers this program from being offered statewide: controlled substance regulations (DEA) and sustainable financing of the program. The team has ambitious plans to tackle both this year. Ultimately, the Take-It-Back pilot project for medications will be very similar to existing, effective, manufacturer-funded take-back projects for products like batteries and electronics.

For more information about the project, you may visit www.medicinereturn.com.

## Grant – Funded Projects Support the Beyond Waste Goal of Reducing Threats from Household and Small Quantity Hazardous Wastes and Materials

The projects listed below have received either Coordinated Prevention Grant (CPG) funding or Public Participation grant (PPG) funding:

**Thurston County Water and Waste Management – CPG funding**
This project provided an avenue of disposal for silver-bearing waste from dentist, veterinarian, and medical facilities as well as local photographers. The silver is recovered and recycled by a local refining company.

**City of Tacoma - CPG funding**
The City of Tacoma, in conjunction with Pierce County Solid Waste and the Tacoma/Pierce County Health Department, developed an Electronics Take-Back Network to create a network of businesses that are willing to provide collection services for unwanted electronics from residences or businesses.

- **Washington Toxics Coalition-PPG Funding**
  Provide educational tools to increase awareness of the dangers of pesticides and hazardous household cleaning products and options to using these products. Expand the Pesticide Free Zone campaign, improve the Toxics Hotline, and broaden their website services.

- **Walla Walla Resource Conservation Committee-PPG Funding**
  Educate the public on ways to reduce, reuse, and recycle; and sponsor a one-time electronics (computer) recycling event in Walla Walla.

- **Re Sources for Sustainable Communities – PPG Funding**
  Provide education and outreach about computers as hazardous wastes. Establish a computer recycling program at the Bellingham RE Store.

- **Automotive Recyclers – PPG Funding**
  Provide vehicle recyclers statewide with free comprehensive cross-media hazardous waste, stormwater and air emissions management inspections. Provide technical assistance in order to reduce the release of hazardous substances.

- **Spokane Neighborhood Action Programs – PPG Funding**
  Increase the knowledge and practice of the "Living Green Program" among all residents by educating the communities with workshops, classes, at-home parties, and training educators.

- **Puget Soundkeeper Alliance – PPG Funding**
  Through the involvement of the counties' EnviroStars program, promote reduction and proper management of hazardous wastes by outreach to marinas in the Puget Sound.

- **Eco Solutions – PPG Funding**
  Provide education/outreach about the effects of toxic lawn and garden chemicals and emissions on human health and the environment in Kitsap County.

# Partnering for the Environment through Environmentally Preferable Purchasing (EPP)

Washington state agencies, local governments and school districts purchase over $4 billion of goods and services each year. A central strategy of the *Beyond Waste Plan* is increasing the purchase of environmentally preferable goods and services by government.

Environmentally Preferable Purchasing (EPP) involves considering environmental and human health effects when purchasing decisions are made. Environmentally preferable purchasing results in less toxins, greenhouse gas emissions, and solid waste impacting human health and the environment.

The *Beyond Waste Plan* encourages state government to reduce waste and the use of toxins in the following priority areas:

- Automotive products and vehicles (re-refined oil, alternative fuels and/or hybrid-fuel vehicles, non-mercury switches, antifreeze and batteries).
- Grounds maintenance/integrated pest management.
- Electronic products.
- Building materials (including paints, carpet, fixtures, and furnishings).
- Cleaning products.
- Safer flame-retardants.

To help state agencies meet these *Beyond Was*te EPP goals, the EPP team, with staff from Solid Waste and Financial Assistance and Hazardous Waste and Toxics Reduction Programs, is involved in the following activity areas:

## EPP Website

State and local governments in Washington State will soon have a centralized source of information on environmentally preferable purchasing on the *Beyond Waste* website (www.ecy.wa.gov/beyondwaste/). Agencies have previously needed to comb information from many different, sometimes conflicting and confusing, sources. The EPP website will offer:

- Product fact sheets on purchasing vehicles, paint, electronics, cleaners and products and services in other *Beyond Waste* priority areas.
- How to institutionalize EPP at your agency.
- Case studies and success stories.
- How to incorporate environmental standards into bid document.

- Laws and directives on EPP.
- Other tools.

## Collaboration with the Office of State Procurement

The EPP team works collaboratively with the Office of State Procurement (OSP) (housed at the state Department of General Administration) to increase environmentally preferable purchasing by state agencies. In 2007, we worked with OSP to add environmental specifications to the state contracts for:

- Flooring products: recycled content.
- Cleaners: bathroom, floor, all-purpose.
- Industrial supplies.

A contract screening tool has been developed to help prioritize state contracts that are coming up for rebid in the future. OSP and Ecology will be working together in the future to green more contracts.

## Outreach to State and Local Governments

State government is directed through many laws and directives to make progress in environmentally preferable purchasing. The EPP team performs outreach to governments to offer them help with achieving these goals by attending events, working with sustainability and contracts personnel and other avenues.

The key laws and directives are:

Executive Orders 02-03 and 5-01 both 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.

The Governor's Climate Change Challenge (Executive Order 07-02) was signed by Governor Gregoire in 2007. It establishes goals for reducing greenhouse gas emissions and building a clean energy economy for Washington State:

- By 2009, reduce total energy purchases by state agencies by 10 percent from 2003 levels, thus achieving the goals established in Executive Order 05-01.
- Retrofit the most polluting diesel engines in school buses and local government vehicles.
- Construct high performance green buildings.

## Product Stewardship

The EPP Team has assisted with meetings involving paint manufacturers, vendors, and local government to help develop a market for recycled paint. The attempt to line up pilot projects in our area was stymied early on by lack of certification of the recycled paint. Once the recycled paint was certified, the pilot projects were blocked by vendor's unwillingness to supply certified products or to mix colors. The EPP Team will also be involved in product stewardship committee regarding mercury-containing products and carpet.

## Standards Revisions

Standards and certifications programs are important tools for encouraging the design of products and services with positive 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 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.

In 2007, Ecology participated in the ongoing revision of the Green Seal standard on cleaners, known as GS-37. Cleaners may contain chemicals that cause cancer, respiratory irritation, skin and eye corrosion, and other harmful effects to human health and the environment. GS-37 approved products are used widely in government buildings, schools and other institutions, so revised standards are very important.

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

Ecology is continuing work on the fifth *Beyond Waste* Initiative, Measuring Progress, which is geared toward measuring success in all the areas of *Beyond Waste*. The goal of the Measuring Progress Initiative 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 the individual initiatives. We are doing this by developing effective and reasonable ways to measure how successful Washington is at reducing the use of toxic substances and the generation of both solid and hazardous wastes.

Ecology has developed performance indicators to track progress toward the major *Beyond Waste* initiatives - industries, green building, organics recycling, and small-volume hazardous wastes. Specific indicators for the initiatives have been developed, baselines have been established, and the indicators are available on the *Beyond Waste* progress report (is available at the *Beyond Waste* website, www.ecy.wa.gov/beyondwaste/).

Specific indicators include solid waste generation, hazardous waste generation, risk from toxic releases, solid waste recycling, hazardous waste recycling, electronics recycling, organics recycling, and green building.

Ecology is also developing several broader, overarching, long-term indicators, which are intended to measure the overall progress toward reaching the *Beyond Waste* vision. Long-term indicators will track progress toward the *Beyond Waste* thirty-year vision of eliminating most waste and use of toxics. An initial overall feasibility study to determine key indicators was completed by Ecology staff in March of 2006. Additional feasibility work is in progress on overarching indicators. The 2008 progress report will include long-term, overarching indicators.

# Partnering for the Environment through Waste Tire Pile Cleanup

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. Many tire piles have existed for a significant length of time. Tire piles also present a dangerous fire hazard. Ecology has been working with the local health authorities to clean up unauthorized dumpsites and prevent further waste accumulation.

**Waste Tire Pile Cleanups 1989 through 1998**

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 2.2a**
**Tire Pile Cleanup 1990 to 1998**

| Year | # Sites | Estimated Number of Tires | Cost |
|---|---|---|---|
| 1990 | 1 | 92,200 | $102,667 |
| 1991 | 14 | 794,000 | $1,816,894 |
| 1992 | 3 | 1,263,300 | $1,241,133 |
| 1993 | 2 | 57,000 | $65,394 |
| 1994 | 1 | 932,000 | $166,000 |
| 1995 | 2 | 4,158,600 | $4,114,859 |
| 1996 | 3 | 2,380,200 | $3,235,372 |
| 1997 | 1 | 175,000 | $310,200 |
| 1998 | 1 | 2,800,000 | $3,378,947 |
| **TOTAL** | **28** | **12,652,300** | **$14,431,466** |

**Waste Tire Pile Cleanups 2005 through 2010**

In 2005, the Legislature passed Substitute House Bill (SHB) 2085, creating a Waste Tire Removal Account to fund cleanup of unauthorized and unlicensed tire piles. Funds for this account come

from a $1 fee charged on each new replacement tire sold in Washington. Under SHB 2085, the state will collect this fee until July 2010.

To be eligible for the cleanup program, piles must contain more than 800 waste tires (or the combined weight of 16,000 pounds of tires). Ecology coordinates cleanups of waste tire piles with local health departments, fire departments, businesses, tribes, and private citizens.

## 2007 Cleanup Removes Over Half the Waste Tires in Washington

By the end of 2007, Ecology identified 97 tire pile sites in Washington State, containing approximately 4 million waste tires. Cleanup data are provided in tons of tires; one ton of tires equal about 100 passenger tires. Efforts in 2007 resulted in cleanup of nearly 3 million tires at 22 sites. The remaining 75 sites contain about 1.3 million tires.

**Table 2.2b**
**Summary of Numbers of Tire Pile Sites**

| Region | Sites Completed | Sites Remaining | Total Number of Sites |
|---|---|---|---|
| Southwest | 17 | 8 | 25 |
| Eastern* | 5 | 47 | 52 |
| Northwest | 0 | 20 | 20 |
| **TOTALS** | **22** | **75** | **97** |

* Includes the Goldendale-Wing Road site

The following table summarizes the cleanup activities completed through the end of 2007. The entire Goldendale-Wing Road cleanup is complete, representing nearly 50 percent of the cleanup work in the state.

**Table 2.2c**
**Summary of Tire Pile Cleanup in Tons**

| Region | Tons Removed | Tons Remaining | TOTAL TONS | Percent Reused/Recycled |
|---|---|---|---|---|
| Wing Road | 20,240 | 0 | 20,240 | 8.4% |
| Southwest | 6,693 | 2,238 | 8,931 | 38.2% |
| Eastern | 1,102 | 8,364 | 9,466 | 71.1% |
| Northwest | 0 | 2,551 | 2,551 | 0% |
| **TOTALS** | **28,035** | **13,153** | **41,118** | **18%** |

At the end of this section a map of Washington illustrates where the known tire piles are located and how many sites and tons are in each county. Counties shown in black represent locations of completed tire cleanup. Counties or boxes that show numbers in grey represent remaining tire cleanup sites. Counties shown in white have not reported any tire pile sites needing cleanup.

## Goldendale-Wing Road Tire Pile Cleanup is Complete

Ecology's first priority was to quickly clean up the largest tire pile in the state. Nearly fifty percent of the state's waste tires were located in one pile on Wing Road in Goldendale, in Klickitat County. The contractor completed the cleanup in 100 working days, removing an average of 230 tons of tires from the site each day. Because local tire recycling and reuse markets do not have the capacity to absorb this much material in so short a time, most of the tires were shredded and landfilled.


Aerial view of Goldendale tire piles

An aerial photograph of the site shows the 9 piles that contained about 2 million tires. Photographs of the cleanup are provided below. The October 2006 picture shows the tire piles before the removal started. Cleanup of this site started in June of 2007 and was completed in November 2007. The November 2007 picture shows the site during final cleanup activities.

Goldendale Tire Pile October 2006

Goldendale Site, November 2007

Total tons and disposition of tires removed from the Goldendale-Wing Road site are provided in the following table. Recycling and reuse of 8 percent of the material included retreads, crumb rubber, punched rubber bumpers, tire rings, and scrap steel (wheel rims).

**Table 2.2d**
**Goldendale-Wing Road Tire Pile Cleanup**

| Location | No. of Sites | Tons of Tires Removed | Tons Recycled or Reused | Tons Used for Fuel | Tons Landfilled |
|---|---|---|---|---|---|
| Wing Road Tire Pile* | 1 | 20,240 | 1,697 | 0 | 18,543 |
| Percentages | | | 8.4% | 0% | 91.6% |

* Located in Klickitat County

## Southwest Region Cleanup Nearly Completed

The second cleanup phase included sites in Ecology's Southwest Region, where the next largest piles were located. The second and third largest piles were in Lewis County, in Napavine, containing 2,800 tons of tires, and in Toledo, containing 2,000 tons of tires. These piles were much smaller than the one in Goldendale. The smaller volume of tires and slower pace allowed for more recycling and reuse.

Photographs show the site in Toledo before and during cleanup. The one month cleanup effort at the site in Toledo removed 2,000 tons of tires. About 42 percent of these tires were reused or recycled.

Site in Toledo in Lewis County

Toledo site during cleanup

Total tons and disposition of tires removed from the sites in the southwest counties are provided in the following table. By the end of 2007, cleanup has been completed at 17 southwest sites containing 6,693 tons of tires. Recycling and reuse of these tires depended on their condition. Over 60 percent of the tires were too old and dirty for anything but disposal at a landfill. About 38 percent of the tires were recycled or reused. Tire recycling and reuse included crumb rubber, stamped rubber bumpers, tire rings, scrap steel (wheel rims), and fuel for cement kilns.

**Table 2.2e**
**Southwest Region Tire Pile Cleanup**

| Location | No. of Sites | Tons of Tires Removed | Tons Recycled or Reused | Tons Used for Fuel | Tons Landfilled |
|---|---|---|---|---|---|
| Clark | 1 | 66 | 66 | 0 | 0 |
| Cowlitz | 1 | 25 | 0 | 25 | 0 |
| Lewis | 7 | 5,867 | 1,371 | 616 | 3,880 |
| Jefferson | 3 | 241 | 45 | 74 | 122 |
| Mason | 2 | 126 | 43 | 59 | 24 |
| Pierce | 1 | 242 | 72 | 133 | 37 |
| Thurston | 2 | 126 | 61 | 26 | 39 |
| Southwest Total Completed | 17 | 6,693 | 1,658 | 933 | 4,102 |
| Percentages | | | 24.8% | 13.9% | 61.3% |

Eight more tire pile sites remain to be cleaned up in the Southwest Region counties. The location of these sites is detailed in the following table. There are an estimated 2,238 tons of tires at these sites. It is possible that more sites will be discovered as this cleanup work continues. Cleanup at sites in this region will continue into 2008.

**Table 2.2f**
**outhwest Region Remaining Tire Piles**

| County | Number of Sites | Estimated Tons |
|---|---|---|
| Clark | 2 | 380 |
| Cowlitz | 2 | 550 |
| Jefferson | 2 | 410 |
| Lewis | 1 | 20 |
| Thurston | 1 | 878 |
| Southwest Remaining Totals | 8 | 2,238 |

## Eastern Washington Cleanup Just Started

The third cleanup phase includes sites located in the counties of Eastern Washington. Excluding the Goldendale-Wing Road tire pile in Klickitat County, Yakima County contains the greatest accumulation of tires in Eastern Washington with 3,660 tons of tires. Again, the smaller piles and slower cleanup allows for greater recycling and reuse.

Some tire pile sites are well organized piles of tires that will be simple and relatively inexpensive to remove. An example of this type of site is shown in the Pasco photograph, where the tires are sorted and stacked for easy removal. Other sites are more difficult and more expensive to cleanup. The photograph of the site near Lamona shows a more complex site that will be a longer and more expensive cleanup effort.

Organized tire pile in Pasco

Tire dump in Lamona

Total tons and disposition of tires removed from the eastern Washington sites are provided in the following table. Four site cleanups have been completed in Eastern Washington. Recycling and reuse of over 70 percent of these tires has occurred.

**Table 2.2g**
**Eastern Washington Tire Pile Cleanup**

| Location | No. of Sites | Tons of Tires Removed | Tons Recycled or Reused | Tons Used for Fuel | Tons Landfilled |
|---|---|---|---|---|---|
| Benton | 1 | 308 | 308 | 0 | 0 |
| Chelan | 1 | 538 | 209 | 102 | 227 |
| Grant | 1 | 165 | 0 | 165 | 0 |
| Klickitat | 1 | 91 | 0 | 0 | 91 |
| Eastern Total Completed | 4 | 1,102 | 517 | 267 | 318 |
| Percentages | | | 46.9% | 24.2% | 28.9% |

Forty-seven tire pile sites in Eastern Washington still need to be cleaned up. These sites contain about 8,364 tons of tires. Cleanup of three of the sites located within the boundaries of the Yakama Nation reservation will be coordinated with the Yakama Nation. This cleanup effort will continue through 2008.

**Table 2.2h**
**Eastern Washington Remaining Tire Piles**

| County | Number of Sites | Tons |
|---|---|---|
| Adams | 1 | 20 |
| Benton | 5 | 441 |
| Franklin | 2 | 280 |
| Grant | 8 | 1,680 |
| Kittitas | 6 | 1,175 |
| Klickitat | 6 | 358 |
| Lincoln | 4 | 270 |
| Okanogan | 1 | 50 |
| Pend Oreille | 3 | 60 |
| Spokane | 1 | 200 |
| Stevens | 1 | 130 |
| Walla Walla | 2 | 40 |
| Yakima | 7 | 3,660 |
| Eastern Remaining Totals | 47 | 8,364 |

## Northwest Region Cleanup Planned for 2008

The last phase of tire pile cleanup will address the sites located in the counties of Ecology's Northwest Region. A tire pile site located in Skyway is shown on the right.


In the Northwest Region, a total of 20 sites contain about 2,551 tons of tires. Cleanup of these sites will begin in spring 2008 and continue into 2009. Recycling and reuse of about 50 percent of these tires is expected.

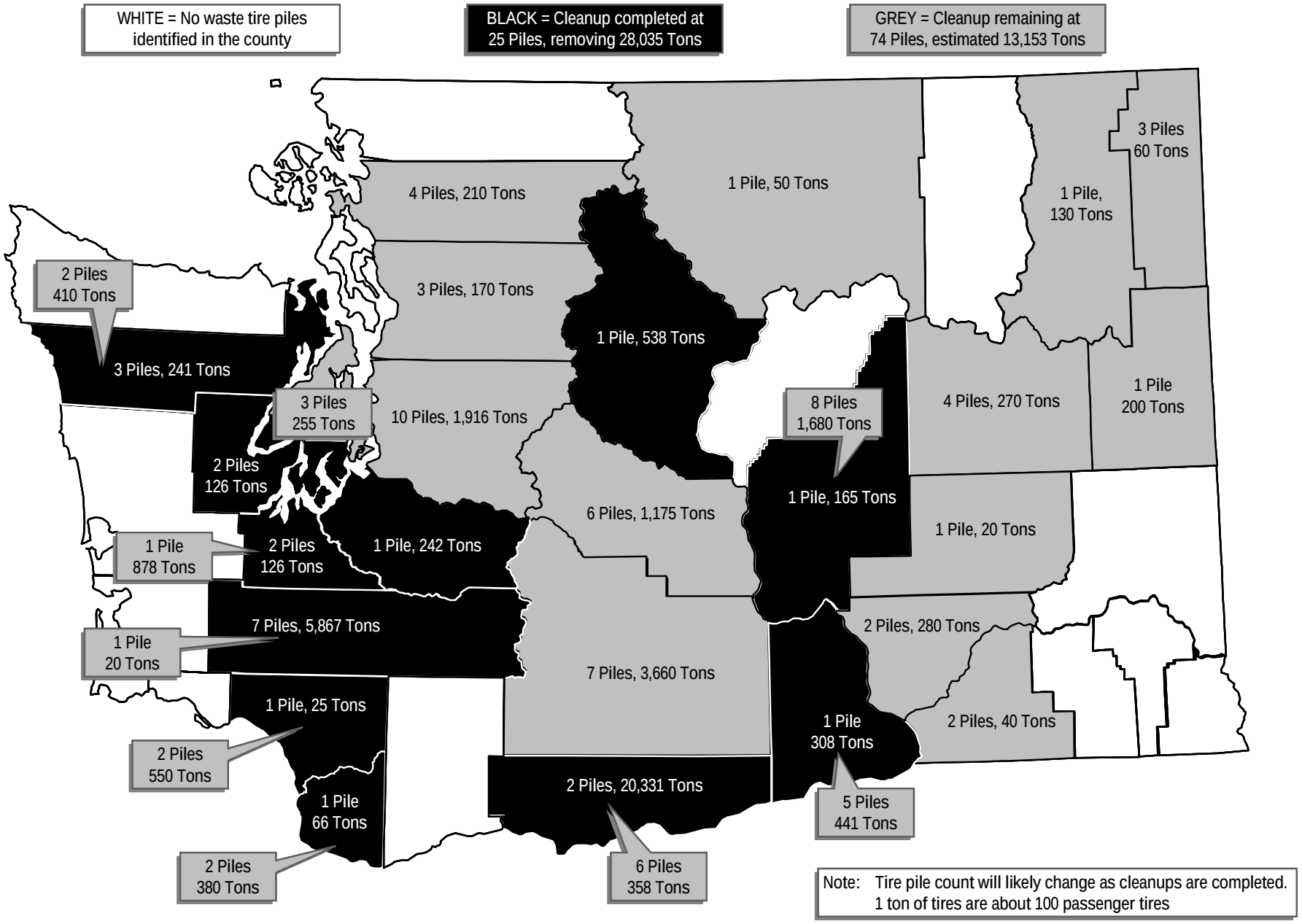
**Table 2.2i**
**Northwest Region Remaining Tire Piles**

| County | Number of Sites | Tons |
|---|---|---|
| King | 10 | 1,916 |
| Kitsap | 3 | 255 |
| Skagit | 4 | 210 |
| Snohomish | 3 | 170 |
| Northwest Remaining Totals | 20 | 2,551 |

The following map of Washington illustrates where the known tire piles are located and how many sites and tons are in each county. It is likely that more sites will be discovered as cleanup work continues.

- Black counties show locations of completed tire pile cleanups.
- Grey counties or boxes show remaining tire pile cleanup sites.
- White counties have not reported any tire pile sites needing cleanup.

# Tire Pile Cleanup in Washington in 2007



# Partnering for the Environment through Local Planning

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

These 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 foundations 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 for carrying out the programs. The plans are to be maintained in "current condition".

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

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

Since the hazardous waste plans have been completed, some counties have revised them. Some have combined their solid waste and hazardous waste plans. One of the recommendations of the *Beyond Waste Plan* is to fully implement local hazardous waste plans. Ecology is current updating the *Hazardous Waste Planning Guidelines.*

Ecology provides technical assistance to local governments as they prepare and carry out their plans. Ecology also approves the plans. Table 2.3 lists the local solid waste plans and hazardous waste plans for each county and two cities (Seattle and Everett) that do individual plans.

**Table 2.3**
**Current Status of Solid and Hazardous Waste Plans in Washington**
**(as of September 2007)**

| COUNTY | CURRENT STATUS SW Plan (date last approved) | WR/R GOAL | CURRENT STATUS HW PLAN (date last approved) | HW Plan Combined with SW Plan? (yes/no) | COMMENTS |
|---|---|---|---|---|---|
| Adams | Yes 2005 | 50% WR/R BY 2012 | 1992 | N | Comprehensive Solid Waste Management Plan (CSWMP) updated April 2005. Hazardous Waste Plan (HW) is joint among Adams, Lincoln and Grant |

| COUNTY | CURRENT STATUS SW Plan (date last approved) | WR/R GOAL | CURRENT STATUS HW PLAN (date last approved) | HW Plan Combined with SW Plan? (yes/no) | COMMENTS |
|---|---|---|---|---|---|
| | | | | | Counties. |
| Asotin | Yes 1998 | 26% by 1997 | 1993 | N | Solid Waste Plan update began January 2007. Needed to resolve status of agreements with Lewiston, Idaho. Those were recently resolved, so reconvened their SWAC in December 2006. |
| Benton | Yes 1994 | 35% by 1995 | 1991 | N | CSWMP is in the final stage of being updated; the final should be submitted for Ecology approval August 2007. HW plan is incorporated. The plan's WR/R goal is a 50% waste diversion rate by 2020 (the 2005 diversion rate was 36.2%). |
| Chelan | Yes 2007 | 25% recycling rate by 2010<br>5% reduction from the current waste stream by 2010 | 2007 | Y | CSWMP was updated April 2007. |
| Clallam | Yes 2000 | 20% by 1996<br>40% long range goal | 1991 | N | Plan is through preliminary draft review, waiting for a final draft submittal, expect an adopted approved plan in 2007. Landfill closure in 2006, new transfer station and MRW facility constructed and in operation to coincide with landfill closure. No plans to update HW plan. |
| Clark | Yes 2000 | 50% WRR by 1995 | 2002 | Y | Will be amending current CSWMP. Draft language complete late 2006 and to Ecology for review mid 2007. |
| Columbia | Yes 2003 | 20% WR/R | 1991 | N | CSWMP approved. MRW Plan being split off from joint plan with Walla Walla and written as new standalone for Columbia County. |
| Cowlitz | Yes 2000 | 50% WRR by 1995 | 1993 | N | Submitted draft plan for Ecology review June 21, 2007 |
| Douglas | Yes 2002 | 25% by 2008 | 2002 | Y | The plan was to be updated in 2007. The county had received preliminary comments from Ecology and UTC. However, |

| COUNTY | CURRENT STATUS SW Plan (date last approved) | WR/R GOAL | CURRENT STATUS HW PLAN (date last approved) | HW Plan Combined with SW Plan? (yes/no) | COMMENTS |
|---|---|---|---|---|---|
| | | | | | they've been granted a year extension due to the Greater Wenatchee landfill expansion making it currently impossible to perform an accurate cost analysis. |
| Ferry | Yes 1993 | 35% WR/R by 1995 50% WR/R by 2013 | 1994 | N | SWAC began meeting in October 2006 to begin the process of updating CSWMP after funding for process was identified. SWAC has begun plan update process. County staff is attempting to write update. Two chapters completed. Considering combining CSWMP and HW plans, but no decision yet. |
| Franklin | Yes 1994 | 35% R by 1995 5% WR by 1998 | 1993 | N | Currently updating CSWMP Consultant has been hired. First Chapter redraft completed in June 2007. County intends to incorporate HW plan into CSWMP as part of update process. SWAC still being populated to reach required membership. Schedule calls for completion of preliminary draft by July 2008. |
| Garfield | Yes 1993 | 26% WR/R by 1997 | 1992 | N | Currently updating CSWMP, first draft complete |
| Grant | Yes 1995 | 22% WR/R by 2000 | 1992 | N | Currently updating 1999 CSWM Plan. HW Plan is joint among Adams, Lincoln and Grant Counties. HW Plan will be split off from joint plan and may be incorporated into chapter in CSWMP. |
| Grays Harbor | Yes 2001 | 50% WRR by 1995 | 1991 | N | Plan review in process, expect a preliminary draft by December 2007. |
| Island | Yes 2000 | Assist the State in achieving its goal of 50% | 2000 | Y | Latest CSWMP approved December 7, 2000, which incorporate and updated the HW plan. Currently updating with plan, with expected completion and approval in 2007. Preliminary Draft submitted April 2007 |
| Jefferson | Yes 2000 | Minimum 29% long range | 1991 | N | Preliminary draft is expected in July 2007, adoption of approved plan is expected in early 2008. No significant changes in solid waste |

| COUNTY | CURRENT STATUS SW Plan (date last approved) | WR/R GOAL | CURRENT STATUS HW PLAN (date last approved) | HW Plan Combined with SW Plan? (yes/no) | COMMENTS |
|---|---|---|---|---|---|
| | | | | | management system. |
| King | Yes 2002 | 50% residential by 2006 43% nonresidential by 2006 | 1997 | N | Latest CSWMP approved May 10, 2002. Plan calls for targets to be evaluated every 3 years as new data becomes available from waste monitoring studies. 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. CSWMP Revision in process, expected completion 2008. |
| Seattle | Yes 2005 | Recycle or compost: 60% of all waste generated in Seattle by 2012; 70% by 2025 | 1997 | N | 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. 2004 Plan Amendment Approved August 19, 2005. Next full revision scheduled for 2008. |
| Kitsap | Yes 2000 | Supports the state goal of reaching 50% recycling. | 2000 | Y | The Kitsap CSWMP includes an update to the 1990 HW Plan. The text is fully integrated into the 2000 CSWMP. Update began in 2007, expected completion in 2008 |
| Kittitas | Yes 2003 | 50% by 2008 | 2003 | Y | Plan approved. |
| Klickitat | Yes 2000 | 50% diversion | 2000 | Y | Plan amendment finalized in 2001. |
| Lewis | Yes 2000 | 18% WRR by 1995, no goal | 2000 | Y | Currently updating CSWMP, draft in 2007. |
| Lincoln | Yes 1999 | 35% WR/R by 1997 | 1992 | N | Amended CSWMP 1999. HW Plan is joint among Adams, Lincoln and Grant Counties. Planner will be consulting with new public works director to encourage moving ahead with a combined planning process in January. County recently took over all recycling services from private vendor. Plan being amended accordingly |
| Mason | Yes | 35% WRR by | 1991 | N | In preliminary draft review, expect |

| COUNTY | CURRENT STATUS SW Plan (date last approved) | WR/R GOAL | CURRENT STATUS HW PLAN (date last approved) | HW Plan Combined with SW Plan? (yes/no) | COMMENTS |
|---|---|---|---|---|---|
| | 1998 | 1998 | | | adopted and approved plan by early 2008. No significant changes in solid waste management. Currently in review to update HW plan; plan will continue to be stand alone. |
| Okanogan | Yes 2006 | Supports the state goal of reaching 50% recycling | 2006 | Y | Plan Approved February 9, 2006. |
| Pacific | Yes 2000 | 32% WRR by 1996 | 1990 – 2000 Operations Plan | N | In preliminary draft, expect adopted and approved plan in early 2008. No plans to update HW plan. |
| Pend Oreille | Yes 2002 | 45% WR/R by 2015 | 1993 | N | Plan approved. Public Works Director has indicated he wants to begin update process by Fall 2007. |
| Pierce | Yes 2001 | 50% WRR by 1995 | 1990 | N | Updating during 2007. Also updating a separate HW plan during 2007. |
| San Juan | Yes 1996 | 50% by 1995 | 1991 | N | Currently updating CSWMP. Expected completion in 2007. |
| Skagit | Yes 2005 | 50% or better by 1995 | 1992 | N | Plan approved on December 2, 2005. HW incorporated. Currently amending the CSWMP, expected completion in late 2007. |
| Skamania | Yes 2002 | 40% WRR by 1998<br>50% long range goal | 2001 | Y | Started updating CSWMP, April 2006. |
| Snohomish | Yes 2001 | 50% recycling goal to be reached approximately 2008 | 1993 | Partially | Latest CSWMP approved July 11, 2001. The recycling potential assessment (RPA) combines two approaches to reaching 50% - a blend of education/ programs and a regulatory approach. The 2001 CSWMP is intended to begin the consolidation of the HW Plan, to update but not replace it. |
| Everett | Yes 1996 | 35% recycling by 2005<br>3% to 5% WR | 1993 | N | Everett no longer intends to join Snohomish County CSWMP plan, but adopted the Snohomish HW plan. |
| Spokane | Yes 1998 | 50% recycling by 2008 | 1993 | N | Currently updating CSWMP. Preliminary draft expected Aug. 1, |

| COUNTY | CURRENT STATUS SW Plan (date last approved) | WR/R GOAL | CURRENT STATUS HW PLAN (date last approved) | HW Plan Combined with SW Plan? (yes/no) | COMMENTS |
|---|---|---|---|---|---|
| | | | | | 2007. |
| Stevens | Yes 1994 | 36% WR/R by 2012 | 1993 | N | Currently updating CSWMP. |
| Thurston | Yes 2001 | Increase recycling rate by 2.5% by 2005 | 1993 | N | Preliminary draft expected by December 2007, adopted and approved plan expected by mid 2008. Concurrently reviewing HW plan. |
| Wahkiakum | Yes 2003 | 20% WRR by 1996 | 2001 | N | Started process of updating plan June 2007. |
| Walla Walla | Yes 1994 | 40% by 2002 | 1991 | N | Currently updating 1994 CSWMP. Incorporating HW Plan as a section of revised CSWMP. |
| Whatcom | Yes 1999 | 50% diversion | 1991 | N | County currently updating CSWMP. Expected completion in 2008. The City of Bellingham is the lead on MRW. |
| Whitman | Yes 2006 | 40% WR/R by 2001 | 1992 | N | Plan approved and current. |
| Yakima | Yes 2003 | 35% by 2005 40% by 2007 | 1991 | N | Plan approved. |

# Partnering for the Environment through Outreach, Assistance and Information Sharing

## Washington State Solid Waste Information Clearinghouse

In 2007, Ecology launched the first phases of the web-based "Washington State Solid Waste Information Clearinghouse". The website will be completed by the summer of 2008.

A committee of several local government staff has worked with Ecology to plan and develop the information-sharing website. The Information Clearinghouse will allow CPG recipients to report work accomplished online and to share lessons learned with others statewide, helping all recipients to strengthen their programs. The system will collect and maintain information about county and city programs and will facilitate sharing of tools and resources.

While the main audience for this site is local government, both solid and hazardous waste and health department staff, the site will also be accessible to the public in 2008. Information available through the Information Clearinghouse includes:

- State Profile
- County and City Profiles
- Projects
- Outreach Materials
- Resources
- Calendar of Events

- Classified Ads

If you want to learn more about the Information Clearinghouse, provide feedback, or have questions, please contact Shannon McClelland, project coordinator, at (360) 407-6398 or mcsh461@ecy.wa.gov. .

## Landfill and Incinerator Operator Certification Programs

Washington State law requires solid waste landfills and incinerators to have certified operators on site 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 requirements for having certified operators on site at all times apply to the following types of facilities:

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

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

In February 2004, Ecology reached an agreement with the Solid Waste Association of North America (SWANA) to conduct the training, testing, continuing education, re-certification, and program administration for landfill certification. SWANA will provide Ecology annually a list of currently certified persons. Ecology agreed to notify interested parties of upcoming training and testing. Ecology also agreed to notify all interested parties of SWANA's services under this new program structure.

The incinerator certification program continues to be Ecology's responsibility.

To date 575 people have been certified for landfill operations and 388 have been certified for incinerator operations. .

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

The Department of Ecology's (Ecology) award program aims to recognize Washington state kindergarten through 12th grade public schools for developing and managing waste reduction,

Mrs. Marcia Husseman

recycling, environmental education, and sustainability programs. Schools are selected for the creative features of their programs, their purchasing practices, and their overall success at reducing waste and increasing recycling. The program rewards schools for developing innovative environmental curriculum or operating longstanding programs that inspire a sense of environmental stewardship in the students. Additionally, schools that submit outstanding plans for future programs will receive funds to assist with start-up costs.

On May 10, 2007 Ecology Director, Jay Manning, and Solid Waste and Financial Assistance Program Manager, Cullen Stephenson, presented $35,400 in cash awards to 25 schools from across the state. About 175 schoolchildren filled the State's Capitol Rotunda to celebrate their schools' exceptional efforts to conserve resources, reduce waste, and preserve the environment.

**There are three award categories:**

- **Seed Award** assists schools with the costs of starting waste reduction, recycling and sustainability programs. In 2007, 18 schools received awards ranging from $500 to $5,000.

- **Sustainable School Award** helps schools continue and expand ongoing programs that focus on waste reduction, recycling, and sustainability. In 2007, seven schools received awards ranging from $375 to $1,500.

- **Environmental Curriculum Award** encourages schools to develop curricula to teach environmental awareness in Washington schools. It should introduce students, teachers, staff, and administrators to the concepts of sustainability including its social, economic, and environmental relevance. In 2007, no eligible applications were received for this award. The funds from this category were used to award additional applicants in the other award categories.

Mrs. Terry Husseman joined many applicants and guests for the award ceremony at the Capitol Rotunda. Educational displays and activities were provided by Ecology's Litter Program, Compost Program, and the Hands on Children's Museum. After enjoying the organic refreshments, guests were able to contribute their leftovers to Ecology's compost bin.

Most of the school award recipients were present for the celebration. Each school brought a poster or banner depicting their winning programs. Some students even carried "picket signs" supporting their school's composting program.

Ecology's Litter Program Display

Many schools practice environmental stewardship as they carry out beautification projects. School recycling programs often extend into the local communities. In several cases, the citizens, businesses, and tribes are deeply invested in the school's recycling program because it is the largest recycling effort within the community.

Many of the program's recycling efforts are geared toward reducing the schools' garbage by 50 percent or more. Several applicants added composting and green-purchasing plans to the more common recycling programs in their schools.


Students showing support for their program

Some schools are helping their communities by creating recycling and compost centers, supplying local shelters with fresh organic vegetables from their gardens, and planting native shrubs and trees to restore wetland areas.

The state's Office of Superintendent of Public Instruction contributed $10,000 toward the cash awards this year. The additional money allowed the program to recognize more schools and helped to pay travel costs for students and staff attending the ceremony.

Table 2.4 identifies the 2006-2007 winners of the Terry Husseman Sustainable Public School Awards.

**Table 2.4**
**2006-2007 Sustainable Public School Award Recipients**

| Seed Award | |
|---|---|
| Dayton Middle and High Schools, Columbia County | $ 1,550 |
| Cowlitz County Youth Services, Cowlitz County | $ 2,700 |
| Olympic Elementary, Lewis County | $ 1,650 |
| Aberdeen High School, Grays Harbor County | $ 2,000 |
| Taholah High, Grays Harbor County | $ 3,500 |
| Edison Elementary, Skagit County | $ 1,000 |
| Tukwila Elementary, King County | $ 5,000 |
| Snoqualmie Elementary, King County | $ 500 |
| Lawton Elementary, West Woodland Elementary, Laurelhurst Elementary, King County | $ 1,000 |
| John Muir, King County | $ 1,350 |
| Sonoji Sakai, Kitsap County | $ 500 |

| | |
|---|---|
| Omak High, Okanogan County | $ 1,500 |
| Tonasket High School, Okanogan County | $ 2,950 |
| Anacortes Home Education Partnership, Skagit County | $ 500 |
| Darrington High, Snohomish County | $ 1,000 |
| Cascade High, Snohomish County | $ 500 |
| Contract Based Education Alternative Programs | $ 1,700 |
| Madison Elementary, Spokane County | $ 500 |
| **Sustainable School Award** | |
| Asotin Elementary, Asotin County | $ 1,500 |
| West Valley City Middle School, Spokane County | $ 1,500 |
| Acme Elementary, Whatcom County | $ 375 |
| Mt. Baker Junior and Senior High, Whatcom County | $ 375 |
| Kendall Elementary, Whatcom County | $ 375 |
| Harmony Elementary, Whatcom County | $ 375 |
| Lopez Island Elementary, Island County | $ 1,500 |

For more information, visit the Terry Husseman Sustainable Schools Awards site: http://www.ecy.wa.gov/programs/swfa/terryhusseman.html.

## Partnering for the Environment with Washington State Recycling Association

The Washington State Recycling Association (WSRA) is a trade association whose mission is to provide leadership and education to foster the expansion, diversity, and economic vitality of recycling as part of sustainable resource management. The WSRA was formed in 1976 to support the fledgling recycling industry and to promote recycling in Washington. WSRA is a nonprofit 501(c) (6) trade "membership" association and is one of the longest-standing state recycling associations in the country.

Ecology Solid Waste and Financial Assistance Program partners with WSRA by providing sponsorship at the “gold” level and providing a representative to their board of directors. In 2006, representatives from Ecology were also involved on various WSRA committees, which are set up to accomplish various objectives related to the main WSRA mission. Ecology staff chaired the Member Development Committee and participated on the Awards Committee and Legislative and Policy Committee.

WSRA holds a position on the state Solid Waste Advisory Committee (SWAC). They have shown support of the Beyond Waste plan by participating on the work group that is studying future alternatives for financing the solid waste system, and the work group studying Beyond

Waste incentives. They have also shown support by providing stakeholder input to the Beyond Waste indicator development process.

Since 1989 and with the passage of the Waste Not Washington Act - the state's mandate for recycling - industry expansion in both the public and private sectors has paralleled WSRA's growth. It is one of the leading recycling associations in the Nation, with over 700 members. WSRA operates under the governance of a 13-member volunteer board of directors and two full-time staff, and conducts the majority of its annual work plan through actively involved members serving on ten function-specific committees.

WSRA members range from family-owned haulers to Fortune 500 companies, from both rural communities and major cities, and represent private industry as well as local and regional governments, businesses and schools. Benefits and services of the organization include bi-monthly newsletters, annual conference and trade show, "Recycler of the Year" awards, legislative advocacy, networking opportunities and educational workshops.

## The Closed-Loop Scoop Newsletter

The Solid Waste and Financial Assistance Program (SW&FAP) publishes a quarterly newsletter called *The Closed-Loop Scoop*. This newsletter shares important information among public works departments, health districts, private recyclers, Ecology, and other clients and stakeholders. The editor encourages all interested parties to contribute articles that will help readers stay current on legislative matters, solid waste program successes and ideas, and upcoming meetings. More than 700 individuals and organizations across the state subscribe, with many parties opting to receive their copy electronically. *The Closed-Loop Scoop* is available on the Ecology SW&FAP Publications and Forms Web page, http://www.ecy.wa.gov/programs/swfa/nav/publication.html. .

## Recycling Information Line

The Solid Waste & Financial Assistance Program (SW&FAP) operates a toll-free information line to help citizens find ways to reduce waste and recycle. In 2007, staff helped almost 9,000 callers to 1-800-RECYCLE. While many callers simply want to know where and how to recycle common items (those taken by recycling centers and local curbside programs), others have questions of a more complex nature.

Staff can direct callers to alternatives to hazardous household products and locations for the safe disposal of household hazardous waste. Information on used oil recycling and used oil haulers is available. Locations for the recycling of construction, demolition, and landclearing debris are provided. The information line also lists companies that offer commercial pickup for business recycling. Targeted waste streams, such as electronic waste and items containing mercury, continue to offer the information line increased opportunities.

While many local governments operate information lines within their own areas, the statewide information line continues to serve as a first contact for many. Ecology's statewide information line can also provide callers with information on specialized recycling opportunities beyond their own city or county. Staff maintain the database by periodically contacting all recyclers to

determine commodities handled, location (or areas served), and hours. Basic recycling information from the database is available at the information line's own web site: http://1800recycle.wa.gov. This web site also provides links to other on-line databases and exchanges, along with local government and recycling company web sites. Other sections of the SW&FAP web site provide information on using sustainable building materials (http://www.ecy.wa.gov/programs/swfa/greenbuilding/) and information about solid waste facilities and disposal data http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

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

# Chapter III
# Solid Waste Handling Infrastructure

This chapter describes the basic facilities that manage solid waste in Washington State. This chapter includes facilities regulated under the following:

***Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills***, which sets permitting, construction, and operating standards for municipal solid waste landfills in the state.

***Chapter 173-306 WAC, Special Incinerator Ash Management Standards,*** which pertains to MSW incinerator ash monofills.

***Chapter 173-350 WAC, Solid Waste Handling Standards,*** which went into effect in 2003. These standards replace the requirements of the *Minimum Functional Standards for Solid Waste Handling (MFS*), *chapter 173-304 WAC,* for the majority of other solid waste handling facilities.

In Washington State, local jurisdictional health departments issue all but the permits for an ash monofill. Ecology is responsible for preparing the solid waste regulations and has a permit review function for all other solid waste facilities.

This chapter presents information about solid waste facilities as of July 2007.

Ecology has identified 691 solid waste handling facilities. These facilities are in Table 3.2 and sorted by type. In addition to permitted facilities, some facilities, if they meet certain conditions, are exempt from permitting under *chapter 173-350 WAC, Solid Waste Handling Standards*.

Some recycling processors and intermediate recycling facilities are exempt and Ecology included them in the facility count this year. In addition, some exempt composting facilities are also included. As Ecology builds new data tracking systems, the numbers of facilities will be more accurate in the future.

**Table 3.1**
**Facility Types Statewide**

| Facility Type | Statewide Total |
|---|---|
| Ash Monofill | 1 |
| Municipal Solid Waste Landfills | 16 |
| Inert Waste Landfills | 28 |
| Limited Purpose Landfills | 14 |
| Composting Facilities (permitted) | 39 |
| Composting Facilities (exempt) | 8 |

| Facility Type | Statewide Total |
|---|---|
| Recycling Processors (exempt) | 143 |
| Intermediate Recycling Facilities (exempt) | 126 |
| Intermediate Recycling Facilities (permitted) | 33 |
| Land Application | 21 |
| Energy Recovery and Incineration Facilities | 3 |
| Drop Boxes | 51 |
| Transfer Stations | 97 |
| Piles | 48 |
| Surface Impoundments | 2 |
| Tire Piles | 2 |
| Moderate Risk Waste Handling Facilities | 59 |
| **Total All Facilities** | **691** |

Table 3.2 identifies the facilities and the county in which they are located. Maps in this chapter identify the number of each facility type in each county.

**Table 3.2**
**Solid Waste Facilities in Washington *(as of January 2006)***

| County | MSW Landfill | Inert | Limited Purpose | Ash Monofill | Compost Facility | Drop Boxes | Pile Facility | Recycling Facility | Surface Impoundments | Land Application | Transfer Stations | Waste Tire Storage | Energy Recovery Incinerators | MRW Faciliites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Adams** | | | | | | | | | | 2 | 2 | | | 2 |
| **Asotin** | 1 | 2 | | | | | | | | | | | | 1 |
| **Benton** | 1 | 2 | | | | 2 | 3 | 12 | | 1 | 2 | 1 | | 1 |
| **Chelan** | | 1 | | | 1 | | | 4 | | | 3 | | | |
| **Clallam** | | | 1 | | 1 | | 2 | 5 | | | 3 | | | 1 |
| **Clark** | | | 1 | | 2 | | 1 | 8 | | | 2 | | | 8 |
| **Columbia** | | | | | | | | | | | 1 | | | 1 |
| **Cowlitz** | 1 | | 1 | | 1 | 1 | 1 | 3 | | | 1 | | | 1 |
| **Douglas** | 1 | 2 | | | | | | 3 | | | 1 | | | |
| **Ferry** | | | | | | | | 1 | | | 1 | | | 1 |
| **Franklin** | | | | | 3 | | 2 | 7 | | 1 | 1 | | | 1 |
| **Garfield** | | | | | | 1 | | | | | | | | |
| **Grant** | 2 | | | | 5 | 12 | 1 | 8 | | 4 | 1 | | | 1 |
| **Grays** | | 1 | 1 | | | | 1 | 4 | | 2 | 6 | | | 1 |

| County | MSW Landfill | Inert | Limited Purpose | Ash Monofill | Compost Facility | Drop Boxes | Pile Facility | Recycling Facility | Surface Impoundments | Land Application | Transfer Stations | Waste Tire Storage | Energy Recovery Incinerators | MRW Faciliites |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Island** | | | | | 2 | 1 | 3 | 6 | | | 3 | 1 | | 4 |
| **Jefferson** | | 2 | | | 3 | 1 | | 4 | | | | | | 1 |
| **King** | 1 | | 1 | | 3 | 2 | 4 | 44 | | | 13 | | | 5 |
| **Kitsap** | | | | | 1 | 4 | | 9 | | | 5 | | | 1 |
| **Kittitas** | | | 1 | | | | | 3 | | | 2 | | | 1 |
| **Klickitat** | 1 | | | | | 1 | | 1 | | | 3 | | | 3 |
| **Lewis** | | | 1 | | 1 | 6 | | 3 | | 3 | 3 | | | 1 |
| **Lincoln** | | | | | | | 1 | | | 1 | 1 | | | 1 |
| **Mason** | | | | | | 3 | | 15 | | | 1 | | | 1 |
| **Okanogan** | 1 | | | | | | | 3 | | | 2 | | | 1 |
| **Pacific** | | | | | | | | 1 | | 3 | 1 | | | 1 |
| **Pend Oreille** | | | | | | | | | | | 3 | | 1 | 3 |
| **Pierce** | 2 | 2 | | | 5 | 1 | 17 | 36 | | | 10 | | | 3 |
| **San Juan** | | | | | | 1 | | 1 | | | 2 | | | 1 |
| **Skagit** | | 1 | 1 | | 4 | 1 | | 10 | | | 2 | | | 1 |
| **Skamania** | | | | | | | | 1 | | | 3 | | | |
| **Snohomish** | | 3 | | | 5 | 5 | 2 | 24 | | 1 | 5 | | | 2 |
| **Spokane** | 1 | 6 | 1 | 1 | | | 5 | 34 | 1 | 1 | 4 | | 2 | 3 |
| **Stevens** | 1 | | 1 | | | | | 2 | | | 4 | | | 2 |
| **Thurston** | | | | | 2 | 3 | | 10 | | | 1 | | | 1 |
| **Wahkiakum** | | | | | | | | 1 | | | 1 | | | |
| **Walla Walla** | 1 | 2 | | | 5 | | 1 | 3 | | 2 | | | | 1 |
| **Whatcom** | | 1 | 1 | | 1 | 6 | 1 | 21 | | | 4 | | | 1 |
| **Whitman** | | 1 | 1 | | 1 | | 1 | 3 | 1 | | 1 | | | 1 |
| **Yakima** | 2 | 2 | 2 | | 1 | | 2 | 12 | | | 1 | | | 1 |
| **Total** | **16** | **28** | **14** | **1** | **47** | **51** | **48** | **304** | **2** | **21** | **97** | **2** | **3** | **59** |

# Municipal Solid Waste Landfills


**Location and Number of MSW Landfills**

| | | | |
|---|---|---|---|
| Asotin | 1 | Klickitat | 1 |
| Benton | 1 | Okanogan | 1 |
| Cowlitz | 1 | Pierce | 2 |
| Douglas | 1 | Spokane | 1 |
| Grant | 2 | Stevens | 1 |
| King | 1 | Walla Walla | 1 |
| | | Yakima | 2 |

Requirements for municipal solid waste (MSW) landfills are found in chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*.

In 2006, 16 operating MSW landfills accepted 5,398,007.86 tons of waste. (See Chapter V for additional discussion of waste types, amounts and sources.)

In 2006, public entities operated, the majority, 81 percent, of the remaining 16 operating landfills. This has historically been true in Washington. However, while privately owned landfills comprise approximately 20 percent of this type of facility, they have over 89 percent of the remaining capacity.

# Ash Monofills


**Location and Number of Ash Monofills**

Spokane 1

Ash monofills are landfill units that receive ash residue from municipal solid waste incinerator/energy-recovery facilities. The *Incinerator Ash Reside Act*, chapter 70.138 RCW, gave direct permitting authority to Ecology, as well as giving it the authority to develop rules to regulate the disposal of this ash. Under chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, incinerators that burn more than 12 tons a day of municipal solid waste must have a Generator (Ash) Management Plan, approved by Ecology, in place prior to operation of a facility. The ash management plan identifies the location of the ash monofill the incinerator will use for ash disposal.

In 2006, there was only one permitted ash monofill in Washington, located at the Roosevelt Regional Landfill in Klickitat County. The monofill operates under a permit issued by Ecology and received 81,447 tons of special incinerator ash in 2006.

# Limited Purpose Landfills

Limited purpose landfills are regulated under *WAC 173-350-400, Limited Purpose Landfills*. This rule defines a limited purpose landfill as a landfill that no other state or federal environmental regulations apply to and that receives solid wastes limited by type or source. Requirements for these types of landfills now include additional design, ground water monitoring, and financial assurance standards.

In 2006, the 14 limited purpose landfills identified in Washington State reported receiving 760,088 tons of waste.

**Location and Number of Limited Purpose Landfills**

| | | | |
|---|---|---|---|
| Clallam | 1 | Lewis | 1 |
| Clark | 1 | Skagit | 1 |
| Cowlitz | 1 | Spokane | 1 |
| Grays Harbor | 1 | Stevens | 1 |
| King | 1 | Whatcom | 1 |
| Kittitas | 1 | Whitman | 1 |
| | | Yakima | 2 |

# Inert Waste Landfills

A landfill that takes inert materials, as identified in *WAC 173-350-990, Criteria for Inert Waste*, will need to meet the requirements of *WAC 173-350-410, Inert Waste Landfills*.

In 2006, inert landfills reported receiving 1,231,565 tons of waste. In 2006, there were 28 inert/demolition landfills listed in the state.

**Location and Number of Inert Waste Landfills**

| | | | |
|---|---|---|---|
| Asotin | 2 | Skagit | 1 |
| Benton | 2 | Snohomish | 3 |
| Chelan | 1 | Spokane | 6 |
| Douglas | 2 | Walla Walla | 2 |
| Grays Harbor | 1 | Whatcom | 1 |
| Jefferson | 2 | Whitman | 1 |
| Pierce | 2 | Yakima | 2 |

## Composting Facilities

Composting facilities need to meet the requirements of *WAC 173-350-220, Composting Facilities*. This section of the rule does allow for some specific exemptions from permitting (WAC 173-350-220(1)(b)). Permitted facilities have additional design, operational, and compost quality testing requirements.

In 2006, the 47 composting facilities in Washington State reported producing a total of 1,000,041 tons of composted material.

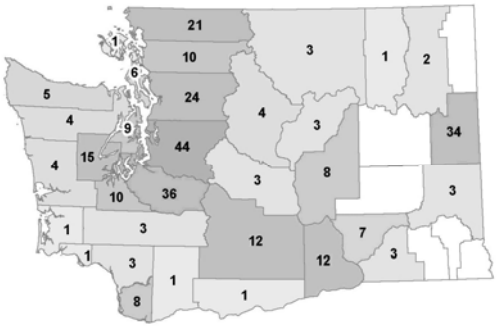
**Location and Number of Compost Facilities**

| | | | |
|---|---|---|---|
| Chelan | 1 | Kitsap | 1 |
| Clallam | 1 | Lewis | 1 |
| Clark | 2 | Pierce | 5 |
| Cowlitz | 1 | Skagit | 4 |
| Franklin | 3 | Snohomish | 5 |
| Grant | 5 | Thurston | 2 |
| Island | 2 | Walla Walla | 5 |
| Jefferson | 3 | Whatcom | 1 |
| King | 3 | Whitman | 1 |
| | | Yakima | 1 |

## Recycling Facilities

Recycling as defined in *WAC 173-350-100, Definitions*, means "transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration. Recycling does not include collection, compacting, repackaging, and sorting for the purpose of transport." Facilities meeting this definition and also meeting the terms and conditions of *WAC 173-350-210(2) Permit Exemption and Notification*, are exempt from solid waste permitting.

There are several activities which in the past may have been considered "recycling" that are not included under this exemption and require a permit under other sections of the *Solid Waste Handling Standards*. *WAC 173-350-210(1) Recycling – Applicability* states that



**Location and Number of Recycling Facilities**

| | | | |
|---|---|---|---|
| Benton | 12 | Lewis | 3 |
| Chelan | 4 | Mason | 15 |
| Clallam | 5 | Okanogan | 3 |
| Clark | 8 | Pacific | 1 |
| Cowlitz | 3 | Pierce | 36 |
| Douglas | 3 | San Juan | 1 |
| Ferry | 1 | Skagit | 10 |
| Franklin | 7 | Skamania | 1 |
| Grant | 8 | Snohomish | 24 |
| Grays Harbor | 4 | Spokane | 34 |
| Island | 6 | Stevens | 2 |
| Jefferson | 4 | Thurston | 10 |
| King | 44 | Wahkiakum | 1 |
| Kitsap | 9 | Walla Walla | 3 |
| Kittitas | 3 | Whatcom | 21 |
| Klickitat | 1 | Whitman | 3 |
| | | Yakima | 12 |

"these standards apply to recycling solid waste. These standards do not apply to:

(a) Storage, treatment or recycling of solid waste in piles which are subject to WAC 173-350-320.
(b) Storage or recycling of solid waste in surface impoundments which are subject to WAC 173-350-330.
(c) Composting facilities subject to WAC 173-350-220.
(d) Solid waste that is beneficially used on the land that is subject to WAC 173-350-230.
(e) Storage of waste tires prior to recycling which is subject to WAC 173-350-350.
(f) Storage of moderate risk waste prior to recycling which is subject to WAC 173-350-360.
(g) Energy recovery or incineration of solid waste which is subject to WAC 173-350-240.
(h) Intermediate solid waste handling facilities subject to WAC 173-350-310."

In 2006, Ecology identified 143 exempt recycling processors, 126 exempt intermediate recycling facilities, and 33 permitted intermediate recycling facilities.

## Land Application

Currently, *WAC 173-350-230 Land Application* requires a permit for beneficially using solid waste for its agronomic value on the land, or soil-amending capability, including land reclamation, unless the waste meets one of the exemption criteria of *WAC 173-350-230(1) Land Application – Applicability*.

In 2006, Ecology identified 21 land application sites.


**Location and Number of Land Applications**

| | | | |
|---|---|---|---|
| Adams | 2 | Lewis | 3 |
| Benton | 1 | Lincoln | 1 |
| Franklin | 1 | Pacific | 3 |
| Grant | 4 | Snohomish | 1 |
| Grays Harbor | 2 | Spokane | 1 |
| | | Walla Walla | 2 |

## Energy Recovery and Incineration Facilities

Energy recovery and incineration facilities designed to burn more than twelve tons of solid waste per-day are permitted under *WAC 173-350-240, Energy Recovery and Incineration Facilities*.

In addition to the solid waste handling permit, solid waste incinerators may be subject to regulations under *chapter 70.138 RCW, the Incinerator Ash Residue Act*. The rule carrying out this act, *chapter 173-306 WAC, Special Incinerator Ash Management Standards*,


**Location and Number of Energy Recovery Facilities**

| | | | |
|---|---|---|---|
| Pend Oreille | 1 | Spokane | 2 |

requires certain solid waste incinerators to prepare generator (ash) management plans. The rule does not apply to incineration or energy recovery facilities that burn only tires, wood waste, infectious waste, sewage sludge, or any other single type of refuse other than municipal solid waste. It also does not apply to facilities that burn less than 12 tons of municipal solid waste a day.

In 2006, Ecology identified three energy recovery or incineration facilities statewide. They reported 326,584 tons of waste incinerated in 2006. Of the three permitted facilities, only the Spokane Regional Waste-to-Energy Facility is subject to the requirements of *chapter 173-350 WAC* and *chapter 173-306 WAC*. This facility must have a generator ash management plan, approved by Ecology, which addresses the handling, storage, transportation, and disposal of incinerator ash. The ash is currently disposed of in the ash monofill at Roosevelt Regional Landfill.

## Intermediate Solid Waste Handling Facilities

Transfer stations, drop boxes, and baling and compaction sites are permitted under *WAC 173-350-310 Intermediate Solid Waste Handling Facilities*. Some material recovery facilities may be exempt from permitting if they meet the requirements of *WAC 173-350-310(2) Materials Recovery Facilities-Permit Exemption and Notification*.

In 2006, Ecology identified 97 transfer stations statewide and 51 drop boxes statewide.


**Location and Number of Drop Boxes**

| | | | |
|---|---|---|---|
| Benton | 2 | Klickitat | 1 |
| Cowlitz | 1 | Lewis | 6 |
| Garfield | 1 | Mason | 3 |
| Grant | 12 | Pierce | 1 |
| Island | 1 | San Juan | 1 |
| Jefferson | 1 | Skagit | 1 |
| King | 2 | Snohomish | 5 |
| Kitsap | 4 | Thurston | 3 |
| | | Whatcom | 6 |


**Location and Number of Transfer Stations**

| | | | |
|---|---|---|---|
| Adams | 2 | Lewis | 3 |
| Benton | 2 | Lincoln | 1 |
| Chelan | 3 | Mason | 1 |
| Clallam | 3 | Okanogan | 2 |
| Clark | 2 | Pacific | 1 |
| Columbia | 1 | Pend Oreille | 3 |
| Cowlitz | 1 | Pierce | 10 |
| Douglas | 1 | San Juan | 2 |
| Ferry | 1 | Skagit | 2 |
| Franklin | 1 | Skamania | 3 |
| Grant | 1 | Snohomish | 5 |
| Grays Harbor | 6 | Spokane | 4 |
| Island | 3 | Stevens | 4 |
| Jefferson | 1 | Thurston | 1 |
| King | 13 | Wahkiakum | 1 |
| Kitsap | 5 | Whatcom | 4 |
| Kittitas | 2 | Whitman | 1 |
| Klickitat | 3 | Yakima | 1 |

# Piles Used for Storage or Treatment

Piles used for storage or treatment are regulated under *WAC 173-350-320 Piles Used for Storage or Treatment*.

In 2006, Ecology identified 48 regulated piles (not including composting or tires) statewide.


**Location and Number of Piles**

| | | | |
|---|---|---|---|
| Benton | 3 | King | 4 |
| Clallam | 2 | Lincoln | 1 |
| Clark | 1 | Pierce | 17 |
| Cowlitz | 1 | Snohomish | 2 |
| Franklin | 2 | Spokane | 5 |
| Grant | 1 | Walla Walla | 1 |
| Grays Harbor | 1 | Whatcom | 1 |
| Island | 3 | Whitman | 1 |
| | | Yakima | 2 |

# Waste Tire Storage and Transportation

Waste tire storage facilities of more than 800 tires are regulated under *WAC 173-350-350 Waste Tire Storage and Transportation*. A significant change in the regulation is the requirement of financial assurance for the waste tire storage site (*WAC 173-350-350(9) Waste Tire Storage and Transportation – Financial Assurance Requirements*).

In 2006, Ecology identified two privately owned permitted tire piles.


**Location and Number of Waste Tire Piles**

| | |
|---|---|
| Benton | 1 |
| Island | 1 |

# Moderate Risk Waste Handling

Moderate risk waste (MRW) facilities are regulated under *WAC 173-350-360 Moderate Risk Waste Handling*. This section of the regulation also addresses mobile systems and collection events, limited MRW facilities, and product take-back centers.

The new rule includes two significant additions. First are the requirements for flammable gas monitoring and exhaust ventilation at some facilities. The second addresses financial assurance for the fixed moderate risk waste facilities that store more than 900 gallons of MRW on-site, excluding used oil *(WAC 173-350-360(9) Moderate Risk Waste Facilities – Financial Assurance Requirements).*

In 2006, Ecology identified 59 fixed moderate risk waste facilities statewide (See Chapter VII. Moderate Risk Waste Collection System for details on types and amounts of materials collected in 2004.).

**Location and Number of MRW Facilities**

| | | | |
|---|---|---|---|
| Adams | 2 | Lewis | 1 |
| Asotin | 1 | Lincoln | 1 |
| Benton | 1 | Mason | 1 |
| Clallam | 1 | Okanogan | 1 |
| Clark | 8 | Pacific | 1 |
| Columbia | 1 | Pend Oreille | 3 |
| Cowlitz | 1 | Pierce | 3 |
| Ferry | 1 | San Juan | 1 |
| Franklin | 1 | Skagit | 1 |
| Grant | 1 | Snohomish | 2 |
| Grays Harbor | 1 | Spokane | 3 |
| Island | 4 | Stevens | 2 |
| Jefferson | 1 | Thurston | 1 |
| King | 5 | Walla Walla | 1 |
| Kitsap | 1 | Whatcom | 1 |
| Kittitas | 1 | Whitman | 1 |
| Klickitat | 3 | Yakima | 1 |

# Chapter IV
# Statewide Litter Prevention & Cleanup Programs

Chapter 70.93 RCW, *the Waste Reduction, Recycling, and Model Litter Control Act*, makes Ecology the lead agency in managing statewide litter programs. Work in 2007 focused on re-launching the "litter and it will hurt" campaign and negotiating new litter cleanup contracts and interagency agreements for new biennium (July 2007 – June 2009). The Solid Waste & Financial Assistance Program (SW&FAP) carries out the following core elements of the statewide litter program:

- Helping with coordination of litter control and prevention activities.
- Carrying out the litter prevention campaign.
- Conducting periodic statewide litter surveys.
- Managing allocations from the Waste Reduction, Recycling and Model Litter Control Account.
- Running Ecology Youth Corps litter cleanup crews (EYC).
- Managing the Community Litter Cleanup Program (CLCP).
- Strengthening partnerships with other state agencies and local governments.

## Litter Prevention Campaign

The "litter and it will hurt" campaign is the statewide social marketing campaign aimed at reducing litter on Washington roadways. The campaign has used multiple strategies over several years to raise awareness, alter beliefs, and ultimately change behaviors about litter. Key elements of the campaign include:

- Television, radio, and outdoor (billboard) media.
- A litter hotline.
- A roadway signage program.
- A Web site.
- Distribution of litterbags and campaign materials.
- Enforcement activities.

The "litter and it will hurt" campaign is based on on-going research about the barriers and motivators to littering behavior. This research indicates strong messages about littering fines and penalties are the most effective deterrent to litter. The "litter and it will hurt" slogan premiered in

2002, and campaign materials had information on fines for littering and facts about the litter problem.

In 2006, Ecology completed a thorough campaign evaluation. The evaluation confirmed that the campaign's messages were having a positive impact on peoples' awareness of litter issues, attitudes towards littering behavior, and most importantly, the amount of litter in the state. The evaluation led to a new three-year campaign plan that focuses the campaign on enforcement and addressing potentially dangerous litter, especially unsecured loads. Work implementing the new plan began in 2007.

## *Campaign Re-Launch*

Ecology re-launched the campaign through a series of press-events in April 2007 in Yakima, Spokane, and Seattle. Ecology representatives emceed each event, all of which featured remarks by Washington State Patrol and local citizens who had a personal connection to the unsecured load issue. In Yakima, a woman recounted her near-fatal accident involving a dining room table in the middle of Interstate 90. In Spokane, the prosecuting attorney spoke of his experiences witnessing items falling from trucks and the importance of enforcement. And in Seattle, the widow of a secured load accident victim pled with people to take the time to secure every load.

Each event included a display of dangerous litter collected by Ecology Youth Corps crews, an example of a properly secured load, and handouts of campaign materials such as litterbags and stickers. Local media provided excellent coverage of the events in each venue.

## *New Creative Materials*

Ecology produced new television commercials, billboards and materials such as decals, posters, and litterbags as part of the campaign re-launch. The messages on these materials remind people that driving with an unsecured load is a crime; that people are watching out for littering behavior; and encouraging people to call the litter hotline. The new tag line, "we're looking for litterers. Are you?" is meant to speak to both litterers and the non-littering public.

## *Focus on Secured Load Issue*

The message that driving with an unsecured load is unsafe and illegal is definitely getting out. However, many well-intentioned people do not know how to properly secure a load. Ecology partnered with Washington State Patrol to produce a short video providing tips and examples of how to secure a variety of loads: garbage, tools and equipment, construction materials and debris, and items commonly hauled while moving. Early in 2008, the video and companion materials will be available on-line and will be widely distributed free to the public, our local government, state agency, and business partners.

## *Enforcement Activities*

For a third year, Ecology collaborated with Washington State Patrol and county sheriff offices to conduct litter emphasis patrols. In April 2007, unsecured load emphasis patrols were conducted in King, Kitsap, Grays Harbor and Grant Counties. Ecology ran radio spots during the emphasis patrols and press releases went out in jurisdictions where patrols occurred.

Media about the emphasis patrols has proven to be almost as important as the enforcement itself. When a trooper writes a litter ticket, the only one impacted is the person who got a ticket and perhaps those whom he or she tells about it. However, thousands of people are likely to see or hear a news story about emphasis patrols. The media, coupled with actual enforcement, goes a long way in changing peoples' beliefs about seriousness of littering violations and ultimately changes their behavior.

In two weeks, law enforcement officers made contact (issued warnings or tickets) with 1,621 people. Enforcement of litter laws is such a key component to the campaign, that Ecology requested additional funding for law enforcement activities. In the new biennium (July 2007-June 2009), funding for emphasis patrols will double.

## *Litter Hotline Program*

The litter hotline is a toll-free phone line (866-LITTER-1) available to people 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. Ecology operates the litter hotline in cooperation with the Washington State Patrol (WSP) and the Washington State Department of Licensing. The registered owner of the vehicle reported via the hotline is sent a letter on WSP letterhead, notifying them of details of the incident and the fines for littering.

The hotline continues to be a key component of the campaign. In 2007, the hotline logged 19,925 calls, the most ever. Ecology also began offering on-line reporting and with no formal advertising, received 1,575 on-line reports in 2007. In 2008, Ecology will repeat an anonymous survey of those who receive hotline letters, to make sure the program is having its intended impact.

### *Partnership and Sponsor Program*

Private sponsorships have significantly extended the exposure of the "litter and it will hurt" campaign, but gaining these sponsorships was extremely time-intensive and somewhat difficult. Instead of strict "sponsorships," in 2008, Ecology will implement a strategy to "partner" with local businesses that own trucks such as contractors and landscapers. Ecology will invite these businesses to join a secured-load-team, pledging to educate employees and enact company policies regarding the need to properly secure loads. Ecology also hopes to work with a retail partner who can provide citizens with the tools they need to properly secure loads.

While the work on secured loads is definitely the focus, the campaign cannot lose sight of what people consider more typical litter: bottles, cups, cans and food wrappers. In addition, the campaign must keep in touch with a younger audience. Research has shown that young adults do not respond to traditional media (television and radio commercials). The younger generation primarily uses the internet to get information, entertainment, and even interact with friends. In response to that trend, Ecology started an internet-based project to engage young people.

In partnership with Comcast Spotlight and Washington DECA, Ecology is conducting an on-line video contest for high school students. Given basic information and materials about the "litter and it will hurt" campaign, student are invited to create 30-second television commercials. The spots will be shared on-line through a variety of video-sharing websites. Judges will evaluate the spots and the winner will be professionally produced and used as part of the campaign's media plan in the summer of 2008.

## Litter Program Fund Allocation

The Waste Reduction, Recycling and Model Litter Control Account (WRRMLCA) supports a variety of programs. The legislation (Chapter 70.93 RCW) directs fund allocation as follows:

- 20 percent to local government programs.
- 30 percent to waste reduction and recycling efforts within Ecology.
- 50 percent to litter clean-up and prevention efforts as well as administrative costs.

Besides providing monies for the Ecology Youth Corps (EYC), the fifty percent dedicated to clean-up efforts also pays for litter activities carried out by other state agencies. Funding for the litter prevention campaign, litter staff, and the litter survey, comes from the fifty percent as well.

In the past, Ecology never requested the full appropriation of funds from the WRRLCA, and a fund balance had begun to accumulate. In the 2007 Legislative Session, Ecology requested a "budget add." The Legislature approved the request, resulting in a several million-dollar increase in litter funds. For the current biennium (July 2007–June 2009), $18.42 million from the WRRMLCA was divided as follows:

| | |
|---|---|
| Local Government Funding Programs (20%) | $3.72 million |
| Waste Reduction & Recycling Activities (30%) | $5.64 million |
| Litter Cleanup & Prevention (50%) | $9.06 million |
| **TOTAL** | **$18.42 million** |

# Ecology Youth Corps

2006 marked the 31st year of operation for the Ecology Youth Corps (EYC). The Ecology Youth Corps[11] web site contains regional hiring information, applications, and photos of the EYC in action.

## *Background*

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 crews and median crews. 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 14 - 17 year olds. They mostly clean shoulder areas and interchanges of major state routes and interstates. Additional work occurs on county roads, state and county parks, recreational lands, and other public areas. Over 2,000 youths from across the state apply annually for approximately 300 positions. Youth crews work two four-week summer sessions with a complete turnover of crews occurring mid-summer.

Median crews are composed of young adults 18 years and older. They clean challenging areas of roadways, including medians, complex ramps and interchanges, and exceptionally high-traffic areas.

In 2006, EYC crews collected litter on roadways and public land in the following counties:

**Central Region (CRO)**:
Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima.

**Eastern Region (ERO)**:
Adams, Asotin, Ferry, Franklin, Garfield, Grant, Lincoln, Spokane, Stevens, Walla Walla, and Whitman.

**Northwest Region (NWRO)**:
King, Kitsap, Skagit, Snohomish, and Whatcom.

**Southwest Region (SWRO)**:
Clark, Cowlitz, Grays Harbor, Lewis, Mason, Pierce, and Thurston.

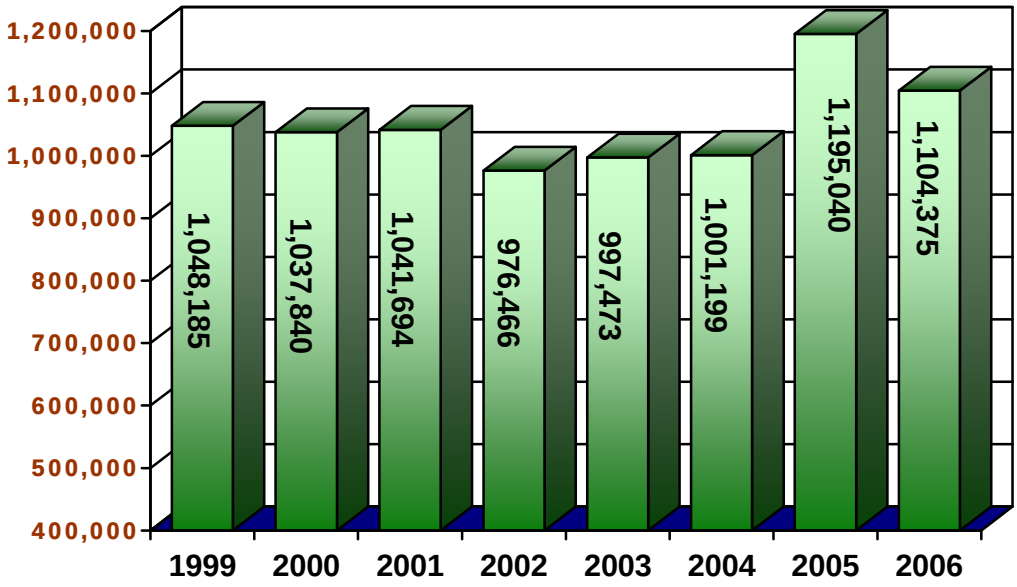
[11] http://www.ecy.wa.gov/programs/swfa/eyc/index.html

The EYC also ensures that youth learn about broader issues of waste reduction, recycling, litter control, composting and other ecological concerns, such as global warming, air and water quality, salmon recovery, and the principles of sustainability. Crews may take field trips to a landfill, a wastewater treatment plant, an estuary, a "green building", or a local organic farm as part of their work experience. Table 4.1 summarizes EYC work for 2006 and Figure 4.1 shows the amount of litter the EYC has picked up over that last eight years.

**Table 4.1**
**Ecology Youth Corps Program Outputs**
**January 1 – December 31, 2006**

| | |
|---|---|
| Total Hours Worked (Supervisor + Crew) | 74,246 |
| Total Pounds Collected (Litter + Illegal Dump + Recycled) | 1,104,375 |
| Miles | 5,368 |
| Acres | 578 |
| Number of Illegal Dumps Cleaned | 81 |

**Figure 4.1 Total Number of Pounds Picked Up by EYC by Year**




Ecology continues to operate the EYC in partnership with the Washington State Department of Transportation (WSDOT). WSDOT carries the crew supervisor FTEs, and Ecology manages all other aspects of the program. The interagency agreement covering this arrangement between Ecology and WSDOT expired in June of 2007. Renegotiating the new agreement proved difficult, with each agency realizing how administrative differences between the agencies hinders the success of the EYC Program.

2008 may prove to be a difficult time for EYC. In late 2007, WSDOT announced a major revision to traffic control plans that govern safety procedures that road crews must follow. Not only will EYC crews have to purchase new safety equipment, the new plans may dramatically impact crew operations, ultimately limiting EYC crews ability to clean state highways.

## 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 the problems of litter and illegal dumps on roadways and other public land. The CLCP contracts are written on a biennial schedule (two-year period from July-June) and 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 the communities taking part. Several jurisdictions also use volunteer groups to assist in cleanup and or educational efforts.

Ecology published new guidelines for the CLCP in the fall of 2006, with applications due in January 2007. Ecology uses a three-part formula to determine the funding amount awarded to each applicant:

- Forty percent of the total amount of money is equally divided between applicants to ensure minimum funding for a basic program in all jurisdictions.
- Thirty-seven and a half percent of the total amount of money is split based on geographic and demographic factors (area, population, miles of roads, and miles driven), ensuring that jurisdictions with higher populations or more road miles receive more funds.
- Twenty-two and a half percent of the total amount of money is allocated based on additional needs criteria, based on the efficiency and effectiveness of the individual programs.

This three-part funding formula has significantly reduced under-use of funds and directed monies to the areas with the biggest litter problems. In the cycle that ended in July of 2007, recipients spent 98 percent of all available funds; a dramatic improvement over the 87 percent spent in 2001-2003.

Activities completed through the CLCP are responsible for over half of all miles cleaned and pounds collected with state litter tax funding. Table 4.2 highlights the work accomplished during 2006. The 4.7 million pounds picked up account for 72 percent of the total reported to Ecology for the year.

**Table 4.2**
**Community Litter Cleanup Program Outputs**
**January 1 – December 31, 2006**

| | |
|---|---|
| Total Hours Worked (Supervisor + Crew) | 191,967 |
| Total Pounds Collected (Litter + Illegal Dump + Recycled) | 4,722,610 |
| Miles | 26,720 |
| Acres | 3,344 |
| Number of Illegal Dumps Cleaned | 11,361 |

A comparison of CLCP outputs across the years illustrates how varied the program is (see Table 4.3). The total amount of money available determines how many crews are deployed, but the number of miles cleaned and pounds picked up depends on the type of work the crew does. For example, crews focusing on cleaning litter from road shoulders will not get as many pounds as crews focusing on illegal dumps. Due to the changing nature of the work, it is difficult to spot overall trends in the program without looking at the data in detail.

Because of the individual nature of each county's program, direct comparisons are problematic. However, each county's activities are reviewed with a critical eye to make sure the funding is used efficiently and effectively given the program parameters.

**Table 4.3**
**Comparison of Community Litter Cleanup Program Outputs**
**2004 - 2006**

| | 2004 | 2005 | 2006 |
|---|---|---|---|
| Total Hours Worked (Supervisor + Crew) | 184,733 | 185,017 | 191,967 |
| Total Pounds Collected (Litter + Illegal Dump + Recycled) | 4,473,192 | 3,786,671 | 4,722,610 |
| Miles | 28,015 | 24,248 | 26,720 |
| Number of Illegal Dumps Cleaned | 4,674 | 4,031 | 11,361 |

For the cycle that began July 2007, Ecology has awarded $2.8 million in CLCP funding. All 39 counties applied for and received funds. This amount was determined before Ecology knew it had received the additional appropriation from the WRRLCA. In late 2007, a supplemental application period was open to distribute the additional monies. The additional funds will be awarded based on the merits of the applications received. New contracts will be written in spring 2008.

## Litter Cleanup by Other State Agencies

The state agency litter work group continues to meet once or twice a year to review activities, improve coordination, and discuss funding. Representatives from the departments of Corrections, Natural Resources, Transportation, Fish and Wildlife, the Parks and Recreation Commission, and Ecology comprise the workgroup.

Using a consensus process, the workgroup negotiates the amount each agency receives through interagency agreements to fund litter and illegal dump activities. Due to the increased budget that

Ecology received, funding for the state agencies increased $275,500 over last biennium. New activities include new Department of Corrections crews and litter enforcement projects by Department of Natural Resources and the Parks and Recreation Commission. Table 4.4 lists the budget for the current biennium.

**Table 4.4**
**Interagency Agreements between Ecology and Other State Agencies for Litter Activities**
**July 1, 2007 – June 30, 2009**

| Agency | 07-09 Biennium |
|---|---|
| Department of Natural Resources | $ 520,000 |
| Department of Corrections | $ 625,000 |
| Department of Transportation | $ 88,000 |
| Parks & Recreation Commission | $ 75,000 |
| Department of Fish & Wildlife | $ 27,500 |
| **TOTAL** | **$1,335,500** |

## 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.

Last biennium (July 2005-June 2007), Ecology had an agreement with Parks for $50,000. Sixty-eight percent of the funding was spent on removal of litter and cleanup of illegal dumpsites. Thirty-two percent was spent on recycling and composting projects. For information on Parks accomplishments, please go to the "Parks" section on the litter website.[12] Accomplishments from last biennium include:

- 217,776 pounds of litter and illegal dump materials cleaned up.
- 156 tires and 19 automobile hulks removed.
- 19 automobile hulks removed.
- 160 new litter signs installed.
- 10,000 car litterbags distributed.

For the new biennium (July 2007-June 2009), Parks received an increase of $25,000 bringing the new interagency agreement total to $75,000. Parks will continue to cleanup litter and illegal dumps and increase recycling in parks statewide. The additional funds will support enforcement projects such as purchase of surveillance cameras and additional signage. Any law enforcement

[12] http://www.ecy.wa.gov/programs/swfa/litter/who.html#a7

officer can enforce litter laws, but it is often not a priority for resource agencies. This additional funding will provide focus for Parks law enforcement staff.

## Department of Corrections

The Department of Corrections (DOC) receives funding through Ecology to run community based correctional litter crews on state roads, on state lands, and in local communities. Last biennium's (July 2005-June 2007) agreement for DOC provided $270,000 to crews in Wenatchee, Spokane, Tri-Cities, Walla Walla, and Yakima. The remaining $180,000 of DOC's allocation was distributed as part of the Community Litter Cleanup Program to crews in Seattle and Ellensburg. Table 4.5 summarizes activity of DOC crews for 2006 (Seattle and Ellensburg activity is reported with CLCP data in the CLCP section of this report).

**Table 4.5**
**Department of Corrections Litter Removal Activity**
**January 1 – December 31, 2006**

| | |
|---|---|
| Total Hours Worked (Supervisor + Crew) | 25,025 |
| Total Pounds Collected (Litter + Illegal Dump + Recycled) | 349,163 |
| Miles | 1,221 |
| Acres | 637 |
| Number of Illegal Dumps Cleaned | 2 |

For the new biennium (July 2007- June 2009), Corrections received an increase of $175,000 bringing the new interagency agreement total to $625,000. Money that was previously funneled through the Community Litter Cleanup Program will once again be included in the primary interagency agreement with Corrections. The funds support all of the crews listed above plus a new crew in Moses Lake. Ecology has also asked Corrections to explore adding a crew in the Tacoma area to serve Pierce and south King Counties.

## Department of Natural Resources

The Department of Natural Resources Camps Program, in partnership with Department of Corrections, puts offender crews to work on state lands. As illustrated by the data in Table 4.6, this program has considerable impact on the cleanup of litter and illegally dumped materials in state-owned forests.

Last biennium's (July 2005- June 2007) interagency agreement between Ecology and Department of Natural Resources (DNR) provided $400,000 for crews at the following camps: Naselle, Larch, Cedar Creek, Monroe, Olympic, Airway Heights and Mission Creek. An additional $55,000 was devoted to contracted and volunteer crew activities.

**Table 4.6**
**Department of Natural Resources Litter Removal Activity**
**January 1 – December 31, 2006**

| | |
|---|---|
| Total Hours Worked (Supervisor + Crew) | 16,209 |
| Total Pounds Collected (Litter + Illegal Dump + Recycled) | 364,296 |
| Miles | 536 |
| Acres | 81 |
| Number of Illegal Dumps Cleaned | 487 |

For the new biennium (July 2007 - June 2009), DNR received an increase of $65,000 bringing the new interagency agreement total to $520,000. Some of the additional funds will go to the camps programs that clean up state lands. However, a majority of the additional funds will go towards enforcement activities: purchase of surveillance cameras and participation in emphasis patrols.

## Department of Transportation

The Department of Transportation (WSDOT) is responsible for picking up litter along state roads, including the bags of litter collected by Adopt-a-Highway groups, the Ecology Youth Corps, and Department of Corrections. The new interagency agreement between Ecology and Transportation provides funding ($88,000) to offset the costs of disposal. This is a ten percent increase in funding from last biennium. In 2006, WSDOT crews removed and disposed of 25,891 cubic yards of litter from state roadways (roughly 5.2 million pounds).

# Looking Ahead

Since launching the "litter and it will hurt" campaign in the spring of 2002, Ecology has learned that litter is more than an eyesore. The hazards posed by litter are real, and sometimes deadly. There have been several fatalities in the last few years caused by road debris and unsecured loads from trucks. While strict enforcement and the accompanying fines continue to be a primary deterrent, the campaign is also using a safety message to get people to change their behaviors. As the campaign matures, activities will shift from those with a simple goal of raising awareness to those that provide tools for real behavior change.

In 2008, Ecology will begin its third litter survey, intensive field research of the types and quantities of litter on state roadways. Ecology will continue to monitor the effectiveness of various campaign elements and concentrate cleanup crews in the dirtiest areas of the state.

# Chapter V
# Solid Waste Generation, Disposal, and Recycling in Washington State

One of the basic aspects of carrying out the *Beyond Waste Plan* is preventing wastes in the first place, rather than managing wastes at the end of the pipe. Recognizing that 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 instead of disposing of them.

In order to measure the progress of *Beyond Waste*, a record of the amount and types of waste generated is essential. To determine the amount of waste that is generated in Washington State, Ecology uses the amount of materials disposed each year, plus the amount of materials recycled and diverted from disposal. As we have gained more understanding of the waste stream and obtained better information about how wastes are managed, the way we calculate this number has changed.

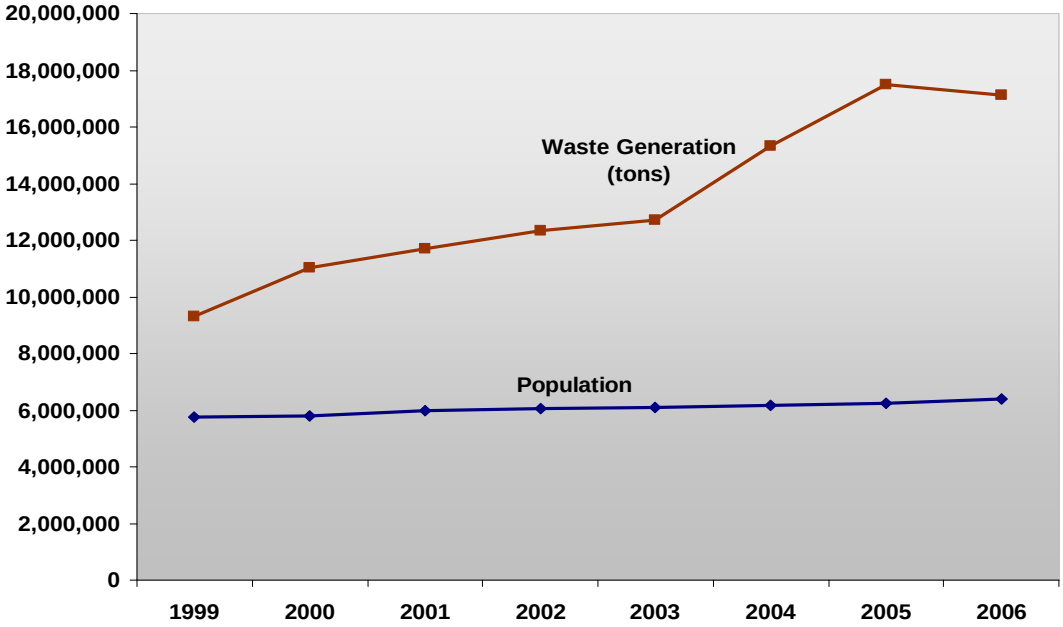
The amount of waste generated continues to rise each year. Washington State's population has continued to grow since Ecology began to track disposal and recycling. Population growth rates in Washington have averaged 2 percent per year from 1988 to 2006, with the total population increasing by almost 1.8 million during that period.[13] With an increasing population often comes an increase in waste generated. However, the amount of waste disposed of, as well as the amount recycled and diverted, has increased at a faster rate than the population. Figure 5.1 shows growth in total solid waste generation and population in Washington.

> ***Changes in this report**:*
>
> *Instead of separate chapters on recycling and disposal, this chapter is a combined discussion of waste generation looking at the total amounts of waste recycled/diverted and disposed.*
>
> *Because of this approach, the narrower, traditional definition of* ***municipal solid waste recycling*** *and the details of that portion of the diverted waste stream are found in Appendix A.*

Since 1994, when Ecology began measuring the disposal stream through annual reports from disposal facilities, per capita waste generation has grown at an average annual rate of 6 percent, with the total annual waste generation increasing by over nine million tons. Since 1994, Washington citizens have generated over 145 million tons of solid waste, roughly equivalent to the amount of solid waste discarded in the United States in one year.

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

**Figure 5.1**
**Solid Waste Generation and Population growth in Washington**




## *Waste Generated by Washington "Citizens"* [14]

### *Determining the Amount of Waste Generated*

Total waste generation is determined simply by adding the amount of waste disposed to the amount of material recycled and diverted from disposal. It is easy to see why the materials we dispose of in landfills and incinerators are considered part of our "waste". However, materials that we separate from disposal for recycling or some other useful activity other than disposal are also a part of our total waste generation. These materials are entering 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.

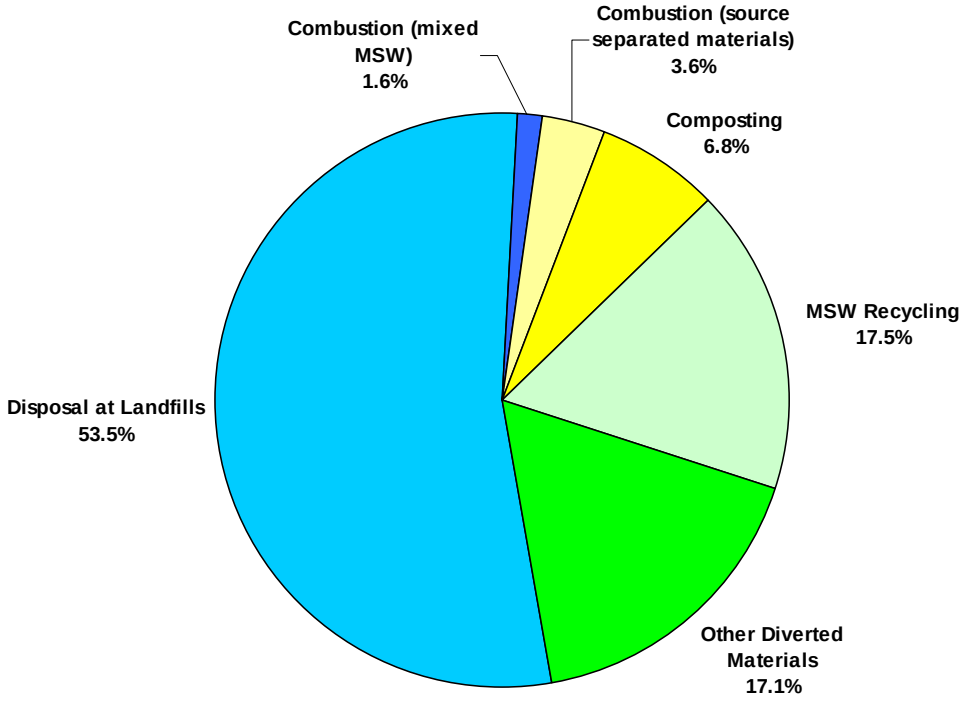
Ecology is currently measuring six types of final disposal and waste management methods:

- Disposal in landfills.
- Combustion of mixed MSW.
- Combustion of source separated material (burning for energy).
- Composting.
- Recycling (transforming material into the same or other products – MSW only).
- Other Diversion (includes recycling of non-MSW materials and reuse).

Figure 5.2 shows a breakdown of the statewide waste management methods in 2006.

[14] "Citizens" as used in this chapter refers not only to each person in the state, but includes business, industries, manufactures and other activities that produce solid wastes.

**Figure 5.2**
**Waste Management Methods 2006**




Some material types have one unique final use. However, there is often more than one final use for a material reported as "recycled" or "diverted", depending on the market shifts and demand. In 2006, Ecology began asking for a more detailed breakdown of these uses for all materials reported.

The largest measured part of Washington's waste generation number is the disposed waste stream. This number has been increasing for several reasons. In some cases we are simply throwing away more. In addition, with the new reporting requirements from chapter 173-350 WAC, *Solid Waste Handling Standards*, we are getting more details on the wastes that we dispose of. We also are getting information about waste disposed of in other states (for example tires that are disposed in Oregon). We are including all materials that are disposed in landfills. An example is clean soil and rock, things that are not defined as solid waste by our regulations, but are disposed of as a waste at a landfill.

The other measured part of Washington's waste generation number is made up of materials recycled and diverted from disposal. The list of materials included under recycling and diversion has increased over time. Since 1986, largely materials that are defined as municipal solid waste by the Environmental Protection Agency have made up the recycling number. (See *Appendix A: Municipal Solid Waste Recycling* for complete details on MSW recycling).

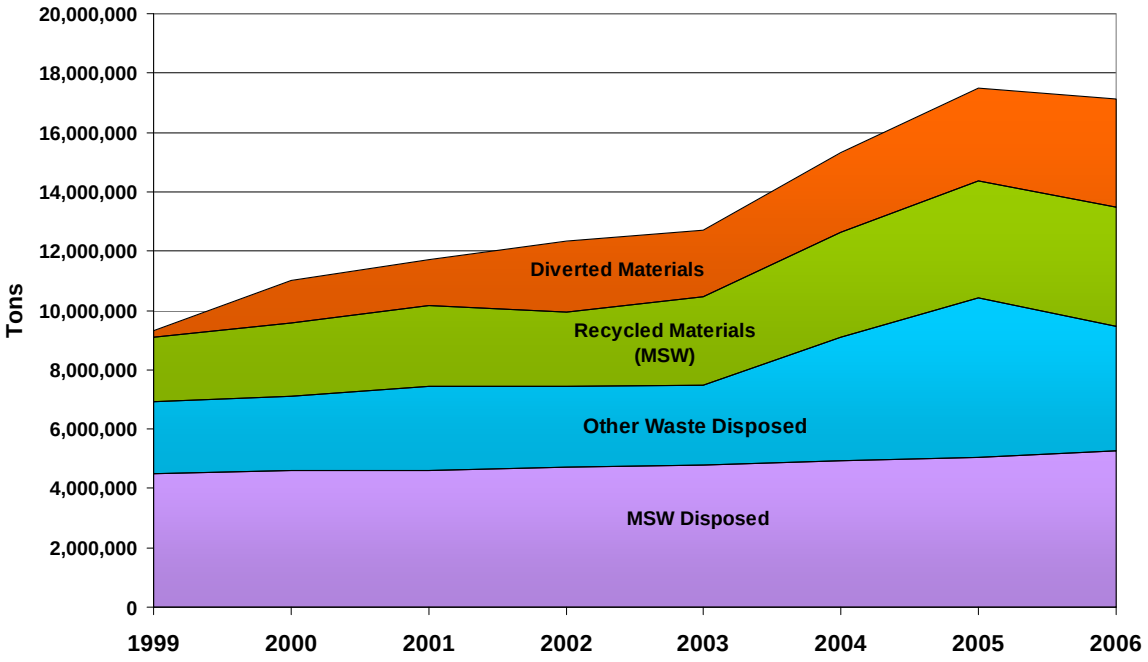
In 1999, along with MSW recycling we started tracking materials that were being "diverted" from disposal. We now include materials that are diverted from the waste stream but are outside of the state's definition of municipal recycling. This expanded measure of waste diversion includes

recyclables such as construction and demolition debris, materials that are burned for energy recovery, and reused materials. As more materials are diverted from disposal, the list of items will increase.

We have increased our efforts to get better reporting from recyclers and those that are diverting waste from disposal. Due to tracking additional materials, improved tracking and reporting from recyclers, as well as actual increases in recycling and diversion, the numbers have increased over time. In 2005, the total waste generation in Washington reached 17,494,320 tons, decreasing slightly in 2006 to 17,132,744.

Figure 5.3 shows the make up of solid waste generation under the broad categories of MSW disposed, other waste types disposed, MSW recycled and solid waste diverted from disposal (non-MSW).

**Figure 5.3**
**Total Solid Waste Generation in Washington**




## Per Capita Waste Generation

One way to evaluate the amount of waste we produce is to look at the numbers on a "per capita" basis. That means the amount of waste generated by each person each day. We use the term in different ways in this report.

The recycling rate in *Appendix A: Municipal Solid Waste Recycling* looks at portion of the waste stream termed the **municipal solid waste stream**. This is waste that mainly households and commercial businesses generate and municipalities (cities and counties) typically report. This includes such items as durable goods, nondurable goods, containers and packaging, food waste

and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition and landclearing debris. Materials that are recycled in the former category make up the "traditional" recycling rate. Some materials in the later group that are diverted from disposal make up the "diversion" rate.

Per capita numbers from Appendix *A: Municipal Solid Waste Recycling* for just the **municipal solid waste stream** are shown in Table 5.1. The per capita generation of **municipal solid waste** in the state in 2006 was 7.97 pounds per person per day, 4.52 pounds were disposed of and 3.46 pounds were recovered for recycling. (For per capita MSW numbers 1986-2006 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

**Table 5.1**
**Municipal Solid Waste Disposed, Recycled and Generated**
**(pounds/person/day)**

| MSW only | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|
| **Disposed** | 4.29 | 4.23 | 4.27 | 4.32 | 4.37 | 4.43 | 4.52 |
| **Recycled** | 2.29 | 2.48 | 2.28 | 2.69 | 3.14 | 3.43 | 3.46 |
| **Generated** | 6.58 | 6.71 | 6.55 | 7.01 | 7.51 | 7.86 | 7.97 |

Municipal solid waste is not all the waste that is produced in the state. To determine the **total waste generation**, we add **all** of the materials recycled, diverted and disposed. This includes not only MSW disposed, but all other waste types disposed at landfills and incinerators, as well as recycled and diverted materials. This results in a much higher generation number for the state of 14.98 pounds per person per day, with 6.60 pounds recycled/diverted and 8.38 pounds disposed (Table 5.2).

**Table 5.2**
**All Solid Waste Disposed, Recycled/Diverted and Generated**
**(pounds/person/day)**

| Per Capita | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|
| **Disposed**[15] | 7.06 | 6.84 | 6.74 | 6.62 | 8.03 | 9.14 | 8.38 |
| **Recycled/Diverted** | 3.69 | 3.91 | 4.46 | 4.91 | 5.78 | 6.48 | 6.60 |
| **Generated** | 10.75 | 10.75 | 11.20 | 11.52 | 13.80 | 15.62 | 14.98 |

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

These numbers are not just waste that is disposed by each person from their household. These include wastes produced by business, industries and other manufacturing activities in our state. They also include wastes that are being cleaned up from our environment, like petroleum contaminated soils from leaking gas tanks at service stations, asbestos being removed from buildings that are torn down or remodeled, and contaminated soils that are dredged from Puget Sound. These types of wastes should be placed in a landfill.

Much of the waste stream includes wastes that could be recycled or reused, or just not made in the first place. These are wastes that 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"***

The amount of waste disposed each year continues to increase. In 2006, a total of 9,450,554 tons was disposed. Table 5.3 shows the amounts and general types of waste disposed of since 1994 by Washington citizens[16].

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. Spreadsheets identifying the disposal location, type and amount of waste for each county for 2006, and previous years' information, can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[16] 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 5.3**
**Waste Disposed by Washington Citizens**
**(1994 - 2006)**

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MSW/ Commercial** | 3,974,383 | 3,905,291 | 3,800,114 | 4,203,507 | 4,276,276 | 4,480,761 | 4,610,914 | 4,611,406 | 4,703,879 | 4,805,205 | 4,917,870 | 5,060,502 | 5,258,076 |
| **Demolition** | 479,479 | 482,118 | 502,425 | 462,784 | 529,515 | 530,417 | 685,799 | 759,586 | 835,400 | 650,473 | 884,567 | 1,014,526 | 1,127,022 |
| **Industrial** | 187,506 | 155,141 | 184,220 | 206,169 | 208,398 | 325,135 | 157,634 | 563,249 | 546,299 | 743,042 | 1,356,415 | 1,092,305 | 512,277 |
| **Inert** | 11,385 | 5,154 | 4,091 | 117,512 | 107,452 | 23,875 | 19,542 | 428,789 | 321,451 | 280,358 | 419,115 | 1,337,372 | 1,029,559 |
| **Wood** | 39,190 | 41,615 | 58,355 | 221,437 | 89,142 | 158,022 | 197,929 | 246,754 | 91,697 | 90,303 | 89,905 | 61,918 | 52,833 |
| **ASH (other than SIA)** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 536,651 | 420,222 | 148,595 |
| **Sludge** | 76,675 | 71,941 | 55,584 | 72,747 | 65,440 | 62,919 | 95,050 | 1,473 | 1,762 | 22,835 | 10,171 | 12,458 | 33,490 |
| **Asbestos** | 23,897 | 10,369 | 9,385 | 13,130 | 13,044 | 12,961 | 11,777 | 10,929 | 11,177 | 15,455 | 18,252 | 21,951 | 29,700 |
| **Petroleum Contaminated Soils** | 242,981 | 214,174 | 270,980 | 474,907 | 198,082 | 372,734 | 284,778 | 616,725 | 784,703 | 568,681 | 489,385 | 957,788 | 740,341 |
| **Other Contaminated Soils** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 146,554 | 231,428 | 225,488 |
| **Tires** | 11,082 | 25,023 | 5,226 | 2,724 | 12,129 | 10,362 | 40,908 | 7,752 | 4,919 | 5,102 | 15,212 | 22,446 | 33,698 |
| **Medical** | N/A | N/A | 5,213 | 7,469 | 7,704 | 5,474 | 6,349 | 5,255 | 2,417 | 2,498 | 2,624 | 2,651 | 2,899 |
| **Other** | 81,573 | 144,115 | 121,051 | 10,794 | 41,866 | 28,450 | 178,156 | 198,259 | 124,512 | 270,992 | 196,793 | 197,010 | 256,627 |
| **Total** | **5,128,151** | **5,054,941** | **5,016,644** | **5,793,180** | **5,549,048** | **5,537,142** | **6,288,836** | **7,450,177** | **7,428,216** | **7,454,944** | **9,083,516** | **10,432,576** | **9,450,605** |

The types of wastes that are reported by landfills are very general and it is hard to know exactly the types of materials that are included. For example, the municipal solid waste, as it is reported by disposal facilities, would include anything that a household or a business throws away. We don't know how much of that waste is paper, food, cans, plastics, bottles, other recyclable materials or who actually made the waste – a household or a business. We also don't know the specific content of wastes reported as industrial or inert. It is difficult to focus waste reduction and recycling efforts on a particular type of waste or on a producer of that waste without having more details. The details can only be determined through a rigorous sampling study, such as a waste characterization study.

A waste characterization study provides a much more detailed look at what is in the waste stream. There are various ways to conduct a waste characterization study. A statewide study could take samples of waste from various sources. For example, a garbage truck from a known neighborhood would be emptied at a transfer station. The waste from that truck would be sorted into several different material groups. It would be repeated during all four seasons. Other sampling would be done in other locations around the state. Depending on the needs of the study, various sources of the waste (that is the sector of society where the waste was made – residential single-family, multi-family, commercial, institutional, industrial, agricultural, etc.) could be sampled.

These studies provide very valuable information that is critical for us to understand the makeup of the waste stream, to know who is producing the waste, and to know what materials are in the waste stream that we should be reducing or eliminating. To be the most useful, waste characterization studies need to be repeated on a regular basis, but they are expensive to conduct.

A statewide waste characterization was last completed in 1992. Since then some individual counties have conducted waste characterizations studies. Information from them has been extrapolated for use statewide.

As we move forward with implementing 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. Ecology is evaluating methods and possible funding alternatives to conduct regular statewide waste characterization studies. Planning is beginning on a statewide study to be conducted in the 2009 calendar year.

# Waste Recycled and Diverted from Disposal[17]

## Measuring Recycling and Diversion Rates

To determine a recycling rate that is consistent and comparable to 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 municipal solid waste (MSW) by the Environmental Protection Agency.[18]

[17] See *Appendix A: Municipal Solid Waste Recycling* for a complete discussion of MSW Recycling.

[18] 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

Since the mid-1990s, however, 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 landclearing debris. The recovery of these materials for uses other than landfill disposal is termed "diversion".

Increasingly, Washington counties and cities have been putting efforts into recovering and recycling these wastes that are outside of 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 more. Knowledge of this waste stream is increasing, although it is not easy to characterize.

Measuring diverted materials is as simple as collecting the number of tons of material diverted from landfills. Many recycling survey respondents have voluntarily listed this information on the recycling survey in the past; in 1999 Ecology began asking for it more specifically.

We are now calculating a "diversion" rate alongside of the traditional "MSW recycling" rate. Calculating the diversion rate takes two steps. First, Ecology measures non-MSW materials diverted from the waste stream along with recyclables that are part of MSW. Ecology then compares the resulting figure to total waste generation (minus a subset of landfilled materials that were not available for recycling or diversion).[19] Washington shows a diversion rate of 49 percent in 2006. (See Table 5.4.[20])

**Table 5.4**
**Diversion Rates**
**1999 to 2006**

| Year | Diversion Rate |
|---|---|
| 1999 | 28% |
| 2000 | 37% |
| 2001 | 41% |
| 2002 | 45% |
| 2003 | 46% |
| 2004 | 47% |
| 2005 | 47% |
| 2006 | 49% |

Wood waste is a large portion of the recovery stream in Washington. A major portion of the 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. In 2002, Ecology began to gather figures on recovered wood that is burned and to measure it as a diverted material. Ecology believes that an undetermined amount of the wood reported as "recycled" is actually burned for energy recovery or used as "hog fuel".

In agriculture, waste 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.

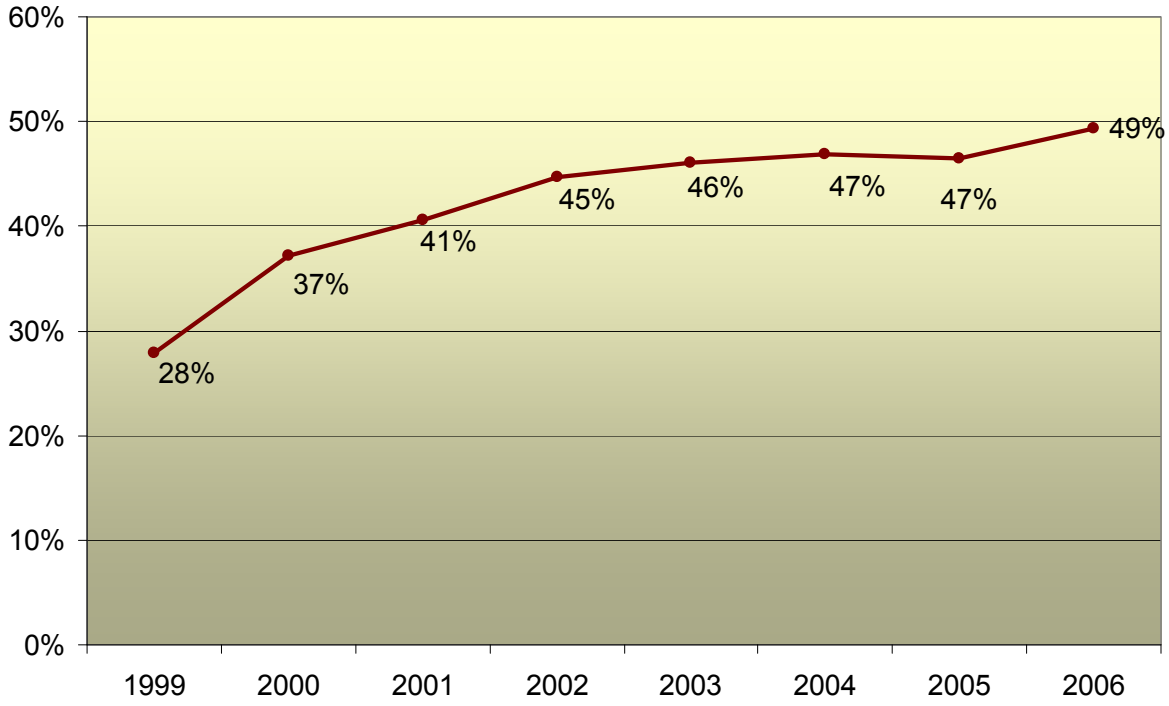
Figure 5.4 shows the diversion rate in Washington since Ecology began measuring it in 1999.

industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

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

[20] Diversion rates were adjusted retroactively in 2006 to reflect the deletion of the category of topsoil (also described as soil blends).

**Figure 5.4**
**Washington State Diversion Rates – 1999 to 2006**[21]




Ecology maintains that we need to study the non-MSW waste stream in more detail. We lack definite information on the total volume of waste created, especially in the industrial sector. If the facility diverting material is conditionally exempt from permitting under chapter 173-350 WAC, *Solid Waste Handling Standards*, the reporting requirement for solid waste recyclables covers these activities. However, if the facility does not fall under requirements for conditional exemption from solid waste permitting, reports are voluntary, as with out of state facilities or haulers with no fixed facility. This makes it difficult to figure a recycling or diversion rate for many of these materials. Ecology may lack enough information on the amount of waste created.

## *Measurement Methodology*

The Legislature requires Ecology to measure the recycling activity in the state each year and report the results. From 1986 until 2002, the tools for measuring recycling activity in Washington included only the annual recycling survey. With the new reporting requirements under chapter 173-350 WAC, *Solid Waste Handling Standards*, the measurement tools now include annual reports for recycling facilities and intermediate solid waste handling facilities, along with the annual recycling survey. We are receiving more information with these additional reporting requirements.

[21] Diversion rates were adjusted retroactively in 2006 to reflect the deletion of the category of topsoil (also described as soil blends).

Ecology sends the survey and annual reporting forms to recycling facilities, firms, haulers, and local governments. These parties 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 the 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 the data. This is done through a phone and e-mail survey of 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 these to the results collected.

The recycling survey is essentially voluntary in that the rule puts forth no penalty for those who do not respond. The annual reports for facilities are mandatory in that facilities could receive a penalty for failing to submit an annual report. 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. Facilities responding to annual reports, however, 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.

For the 2006 reporting year, both the recycling survey forms and the annual reporting forms were available on Ecology's website. Respondents can now print and complete the forms on paper or type on-line and e-mail the forms to Ecology. This system proved to be very successful. It provided the crucial and time-saving computer access to the survey, which some respondents needed. It also allowed Ecology staff to check the forms and follow up on errors or calculate conversion (pounds to tons, for example) before entering the data into the off-line database. This crucial quality-control step helps maintain integrity of the data.

## *Results – 2006 Diversion*

When Ecology began to measure other materials than traditional MSW recycling, the expanded measure continued to include the same materials that it used since 1986 in the calculation of the MSW recycling rate. These materials are those originating from the MSW stream, as Ecology defined it when designing the recycling survey in the mid-1980s. (See *Appendix A: Municipal Solid Waste Recycling*) Table 5.5 provides tonnage figures for each material that figures into the diversion rate from 2003 to 2006.

Other "diverted" materials are surveyed and reported. However, including these materials in the MSW recycling rate would make the comparison invalid for the trends over time. This is because either these diverted materials lie outside the MSW stream or they are recently entering the recycling stream. Most parties that collect and process the diverted materials do so from sources outside the traditional residential and commercial waste stream. Still, Ecology recognizes the creative efforts of local governments and businesses in addressing these wastes and diverting huge amounts of material from landfills. The list of diverted materials is not an exhaustive list, neither

are the numbers complete for these material categories. It is simply a list of the materials reported to Ecology that appear to represent materials diverted from landfills.

**Table 5.5**
**Diverted & Recycled Materials Reported (tons)[22]**
**Diversion Rates 2003-2006**

| Diverted and Recycled Materials Reported | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| Aluminum Cans | 17,608 | 16,010 | 15,441 | 14,951 |
| Antifreeze | 4,722 | 8,050 | 8,767 | 7,507 |
| Ash, Sand & Dust used in Asphalt Production | 10,576 | 40,409 | 14,588 | 4,008 |
| Asphalt & Concrete | 1,600,288 | 2,002,171 | 1,783,418 | 2,295,278 |
| Carpet and Pad | 258 | 304 | 186 | 897 |
| Composting Furnish | 36,049 | 44,419 | 81,904 | 121,454 |
| Computers & Parts | 3,587 | 6,568 | 8,534 | 11,386 |
| Construction & Demolition Debris | 143,844 | 166,325 | 521,087 | 300,820 |
| Container Glass | 74,126 | 81,405 | 82,773 | 90,992 |
| Corrugated Paper | 430,750 | 535,662 | 565,698 | 570,802 |
| Donated Food & Merchandise | - | 306 | 435 | 627 |
| Ferrous Metals | 709,881 | 866,641 | 974,535 | 1,048,885 |
| Fluorescent Light Bulbs | 772 | 732 | 729 | 1,063 |
| Food Processing Wastes | 3,774 | 3,185 | 38,823 | 25,369 |
| Food Waste | 100,755 | 126,257 | 125,390 | 171,744 |
| Gypsum | 76,946 | 35,648[23] | 56,618 | 62,482 |
| HDPE Plastics | 8,485 | 7,991 | 9,319 | 8,000 |
| High-Grade Paper | 59,502 | 70,210 | 58,661 | 71,774 |
| Household Batteries | 143 | 149 | 294 | 1,350 |
| Industrial Batteries | 30 | 29 | - | - |
| Landclearing Debris | 160,158 | 268,486 | 475,015 | 258,563 |
| Landclearing Debris for Energy Recovery | - | - | - | 208,010 |
| LDPE Plastics | 17,925 | 10,604 | 16,209 | 14,928 |
| Milk Cartons/Drink Boxes-Tetra | 1,789 | 8 | 4,529 | 5,755 |
| Miscellaneous | 40 | 5 | 108 | 2 |
| Mixed Paper | 219,111 | 230,934 | 322,732 | 316,874 |
| Newspaper | 215,882 | 261,306 | 259,157 | 294,887 |
| Nonferrous Metals | 114,604 | 99,317 | 122,490 | 135,976 |
| Oil Filters | 1,750 | 3,719 | 2,721 | 2,189 |

[22] Detail may not add due to rounding. See *Appendix A: Municipal Solid Waste Recycling* for a list of materials counted as MSW recycling.
[23] Decrease can be attributed to a drop in reporting for this material.

| Diverted and Recycled Materials Reported | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| Other Fuels (Reuse & Energy Recovery) | 2 | 115 | 16 | 1 |
| Other Recyclable Plastics | 3,482 | 7,783 | 7,247 | 7,776 |
| Other Rubber Materials | 5 | 12 | - | 39 |
| Paint (Reused) | 389 | 688 | 912 | 1,051 |
| PET Plastics | 6,060 | 6,748 | 8,534 | 7,558 |
| Photographic Films | 530 | 522 | 487 | 458 |
| Post-Industrial & Flat Glass | 2,976 | 2,253 | 4,877 | 5,404 |
| Post-Industrial Plastics | - | - | 697 | - |
| Reuse (Clothing & Household) | 918 | 738 | 2,891 | 804 |
| Reuse (Construction & Demolition) | 11,927 | 5,853 | 1,929 | 1,120 |
| Reuse (Miscellaneous) | 7,488 | 215 | 24 | - |
| Roofing Material | 6,493 | 8,186 | 2,353 | 9,120 |
| Textiles (Rags, Clothing, etc.) | 15,497 | 28,927 | 28,750 | 28,724 |
| Tin Cans | 9,492 | 10,082 | 12,133 | 13,936 |
| Tires | 27,753 | 37,568[24] | 53,777 | 23,528 |
| Tires (Baled)[25] | - | - | - | 7,690 |
| Tires (Burned for Energy) | 9,664 | 15,400 | 5,167 | 9,236 |
| Tires (Retreads) | 12,976 | 251 | 4,089 | 5,575 |
| Used Oil | 56,344 | 104,211 | 111,692 | 87,304 |
| Used Oil for Energy Recovery | 15,580 | 825[26] | 306 | 1,283 |
| Vehicle Batteries | 18,780 | 25,518 | 28,903 | 25,414 |
| White Goods | 53,353 | 56,920 | 47,302 | 49,796 |
| Wood | 208,920 | 257,495 | 351,855 | 289,612 |
| Wood Fiber/Industrial Paper | 13,767 | 213 | - | - |
| Wood for Energy Recovery | 189,584 | 129,927 | 163,408 | 372,678 |
| Yard Debris | 546,487 | 646,674 | 643,376 | 665,902 |
| Yard Debris for Energy Recovery | - | - | 30,859 | 21,607 |
| **Total Diverted + Recycled Materials** | **5,231,222** | **6,233,974** | **7,061,745** | **7,682,189** |
| **Total Wastes Disposed[27]** | **6,122,052** | **7,062,771** | **8,116,647** | **7,909,259** |
| **Total Waste Generation** | **11,353,874** | **13,296,745** | **15,178,391** | **15,591,448** |
| **Diversion Rate** | **46.08%** | **46.88%** | **46.52%** | **49.27%** |

[24] In 2004 and 2005, tires include recycled and re-treaded tires.
[25] Began to measure as separate category in 2006.
[26] In 2004 and 2005, a portion of the used oil burned for energy recovery is reported as recycled and included above.
[27] 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 potent strategies for reducing greenhouse gas emissions and conserving energy. Products that enter the waste stream have energy impacts and associated greenhouse gas (GHG) emissions at each stage of their life cycle: 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 the combustion of fossil fuels.

Fossil fuels are also required for extracting and processing the raw materials necessary to replace those materials that are being 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 lower greenhouse gases emitted during manufacturing.

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

Washington's measured diversion efforts for 2006 reduced greenhouse gas emissions by over 3 million tons or over 1000 pounds per person. This is similar to removing 2.5 million passenger cars from the roadway each year - over half of the passenger cars in Washington.[28]

The 7.6 million tons of material diverted from disposal in Washington in 2006 saved over 116 trillion BTUs of energy. This is equal to about half of all energy used in homes in the state annually.

# Waste Disposed in the State of Washington

Another way to look at the waste disposed is to include all the waste that goes to landfills or incinerators in the state. This includes waste brought in from out of state, but does not include waste sent out of state for disposal. With all categories included, 7,716,245 tons of waste was disposed of in all types of landfills and incinerators in Washington in 2006 (see Table 5.6). For total solid waste disposed of from 1993 - 2006 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[28] Figures derived using Waste Reduction Model (WARM), Environmental Protection Agency, http://www.epa.gov/globalwarming/actions/waste/warm.htm.

**Table 5.6**
**Total Amounts of Solid Waste Disposed of in Washington**

| DISPOSAL METHOD | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|
| Municipal Solid Waste Landfills | 4,582,107 | 4,738,808 | 4,659,582 | 4,525,019 | 4,744,561 | 4,572,275 | 5,506,112 | 5,517,342 | 5,398,008 |
| Incinerated Waste | 369,778 | 461,684 | 554,780 | 496,152 | 311,474 | 303,978 | 327,837 | 335,533 | 326,584 |
| Woodwaste Landfills* | 59,410 | 102,484 | 87,552 | 53,298 | 33,171 | 34,188 | * | * | * |
| Inert/Demolition Landfills | 494,528 | 536,155 | 477,383 | 733,843 | 476,917 | 476,214 | 509,927 | 1,531,642 | 1,231,565 |
| Limited Purpose Landfills | 628,896 | 569,747 | 646,662 | 645,592 | 605,284 | 586,670 | 1,075,102 | 1,387,934 | 760,088 |
| **TOTAL** | **6,134,719** | **6,408,878** | **6,425,959** | **6,453,904** | **6,171,407** | **5,973,325** | **7,418,978** | **8,772,451** | **7,716,245** |

* The category of woodwaste landfills is no longer included under *chapter 173-350 WAC, Solid Waste Handling Stan*dards.

# Municipal Solid Waste Landfills

## *Amount of Waste Disposed of in Municipal Solid Waste Landfills*

In 2006, 16 municipal solid waste landfills accepted waste totaling 5,398,008 tons.[29] Of the 16 landfills, 13 were publicly owned and 3 were privately owned.

Six of the 16 landfills received over 100,000 tons of waste in 2006. Three of the largest landfills in Washington, Cedar Hills in King County, LRI – 304th Street in Pierce County, and Roosevelt Regional Landfill in Klickitat County, received 998,207 tons, 976,760 tons, and 2,347,869 tons, respectively. In 2006, two landfills received less than 10,000 tons, Delano Landfill in Grant County and Northside Landfill in Spokane County, compared with 12 MSW landfills in 1994.

Figure 5.5 shows that several smaller and a few mid-sized landfills closed between 1995 and 1996 in response to the more stringent regulations for MSW landfills (chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*). Other landfills are reaching their remaining capacity and are not planning on expanding. There has been a gradual decrease in the number of landfills since 1996. At this time no new MSW landfills are planned in the state.

29 Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities being discussed, the source of the waste and the 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 5.5**
**Number of MSW Landfills**
**(based on tons disposed)**

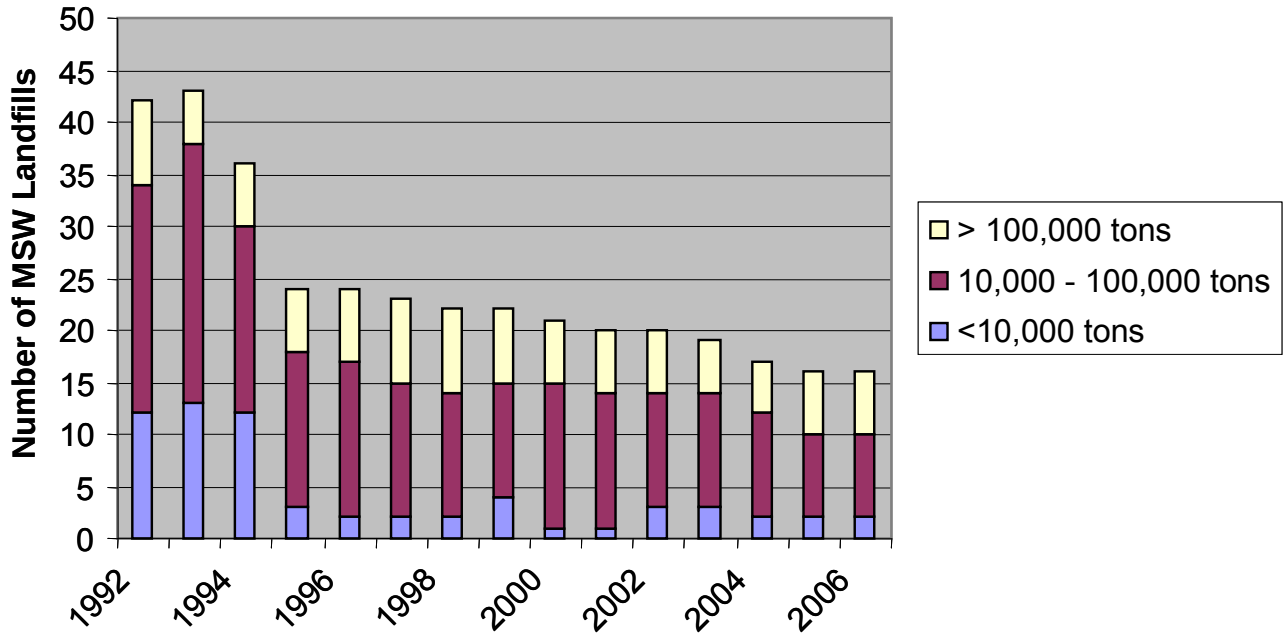
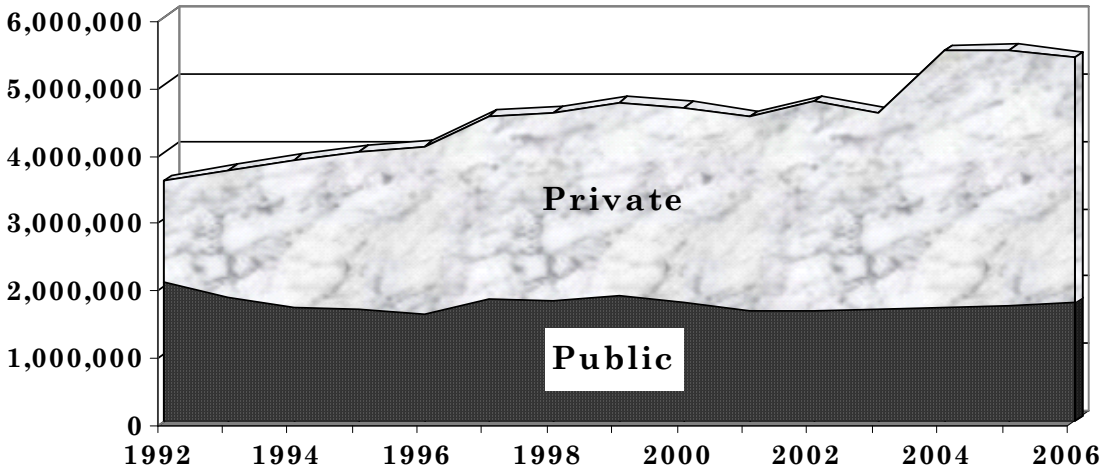



Table 5.7 shows the relationship of waste disposal to public/private ownership. As the table illustrates, 1,758,672 tons of solid waste disposed of went to publicly owned facilities (33 percent), with the remaining 3,639,336 tons going to private facilities (67 percent).

**Table 5.7**
**Waste Disposed in MSW Landfills – Public/Private**

| OWNERSHIP | NUMBER OF MSW LANDFILLS | | AMOUNT OF WASTE DISPOSED (Tons) | | % TOTAL WASTE DISPOSED | |
|---|---|---|---|---|---|---|
| | 1991 | 2006 | 1991 | 2006 | 1991 | 2006 |
| PUBLIC | 36 | 13 | 2,696,885 | 1,758,672 | 69 | 33 |
| PRIVATE | 9 | 3 | 1,192,207 | 3,639,336 | 31 | 67 |
| **TOTAL** | **45** | **16** | **3,889,092** | **5,398,008** | **100** | **100** |

**Figure 5.6**
**Comparison of Waste Disposed in Public and Private MSW Landfills (tons)**




The amount of waste disposed of in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (see Figure 5.6). The trend has continued since 1991, when the state first started tracking this type of information. The amount of waste disposed of in the private facilities has increased from 31 percent since 1991 to 69 percent in 2005. The private Roosevelt Regional Landfill in Klickitat County and LRI-304th Street Landfill in Pierce County can account for the majority of this increase.

## *Types of Waste Disposed of in Municipal Solid Waste Landfills*

Traditionally, many people think of the waste going into MSW landfills as being mostly household waste.[30] Annual facility reports show that a much wider variety of waste is disposed of in the MSW landfills. These wastes need to be considered in terms of remaining available capacity. Fourteen of the sixteen landfills reported disposing types of solid waste other than MSW. Demolition, industrial, inert, wood waste, sludge, asbestos, petroleum-contaminated soils (PCS), other contaminated soils and tires were the major waste streams. (Two landfills reported all types of waste under the general "municipal" category so exact amounts cannot be determined. Other landfills report in only a few categories. This makes knowing exact amounts of specific waste types difficult.).

In 2004, Ecology developed new annual reports expanding the list of waste types. For the amounts and types of waste that individual MSW landfills reported in 2006, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

For a more consistent look at the waste stream over time, this report combined some categories. Table 5.8 shows changes in waste, types, and amounts disposed of in MSW landfills from 1997

30 "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).

through 2006. For MSW landfill data from 1992 - 2006, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

**Table 5.8**
**Waste Types Reported Disposed in MSW Landfills**

| WASTE TYPES | 1997 (Tons) | 1998 (Tons) | 1999 (Tons) | 2000 (Tons) | 2001 (Tons) | 2002 (Tons) | 2003 (Tons) | 2004 (tons) | 2005 (Tons) | 2006 (Tons) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Municipal Solid Waste*** | 3,083,286 | 3,222,639 | 3,421,415 | 3,336,745 | 3,432,359 | 3,440,727 | 3,394,428 | 3,598,760 | 3,631,873 | 3,787,080 |
| **Demolition Waste** | 385,412 | 446,172 | 437,005 | 569,239 | 373,254 | 379,405 | 324,069 | 366,087 | 541,945 | 551,572 |
| **Industrial Waste** | 163,431 | 159,781 | 232,905 | 88,841 | 201,198 | 179,058 | 212,918 | 1,034,615 | 624,958 | 182,661 |
| **Inert Waste** | 117,512 | 107,452 | 23,875 | 19,349 | 26,376 | 17,092 | 2,635 | 1,705 | 15,780 | 15,842 |
| **Commercial Waste** | 173,863 | 158,256 | 129,070 | 93,752 | 66,391 | 99,048 | 93,036 | - | - | - |
| **Wood** | 57,128 | 60,383 | 68,889 | 47,087 | 34,254 | 55,149 | 47,622 | 25,576 | 9,896 | 4,462 |
| **Ash (other than SPI)** | - | - | - | - | - | - | - | 3,444 | 2,857 | 2,432 |
| **Sewage Sludge** | 72,741 | 67,419 | 62,920 | 47,783 | 1,473 | 1,762 | 23,435 | 10,172 | 12,476 | 21,303 |
| **Asbestos** | 9,558 | 10,684 | 9,666 | 7,922 | 5,991 | 4,908 | 9,625 | 12,086 | 7,943 | 5,633 |
| **Petroleum Contaminated Soils** | 444,260 | 288,407 | 312,247 | 231,290 | 217,721 | 457,061 | 342,172 | 279,982 | 320,283 | 455,964 |
| **Other Contaminated Soils** | - | - | - | - | - | - | - | 49,454 | 212,692 | 224,608 |
| **Tires** | 14,912 | 19,130 | 12,581 | 43,188 | 8,567 | 5,776 | 9,512 | 7,462 | 6,942 | 8,525 |
| **Special** | 6 | 904 | - | 437 | 917 | 567 | - | - | - | - |
| **Medical** | - | - | - | 239 | 387 | 372 | 2,459 | 2,565 | 2,576 | 2,721 |
| **Other**** | 10,809 | 40,880 | 28,235 | 173,711 | 156,131 | 103,636 | 110,364 | 114,204 | 127,121 | 135,206 |
| **TOTAL** | **4,532,918** | **4,582,107** | **4,738,808** | **4,659,582** | **4,525,019** | **4,744,561** | **4,572,275** | **5,506,112** | **5,577,342** | **5,398,008** |

* Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.

** Some of the "other" types of waste reported include autofluff, vactor waste, WWT grit and uncontaminated soils.

## *Future Capacity at Municipal Solid Waste Landfills*

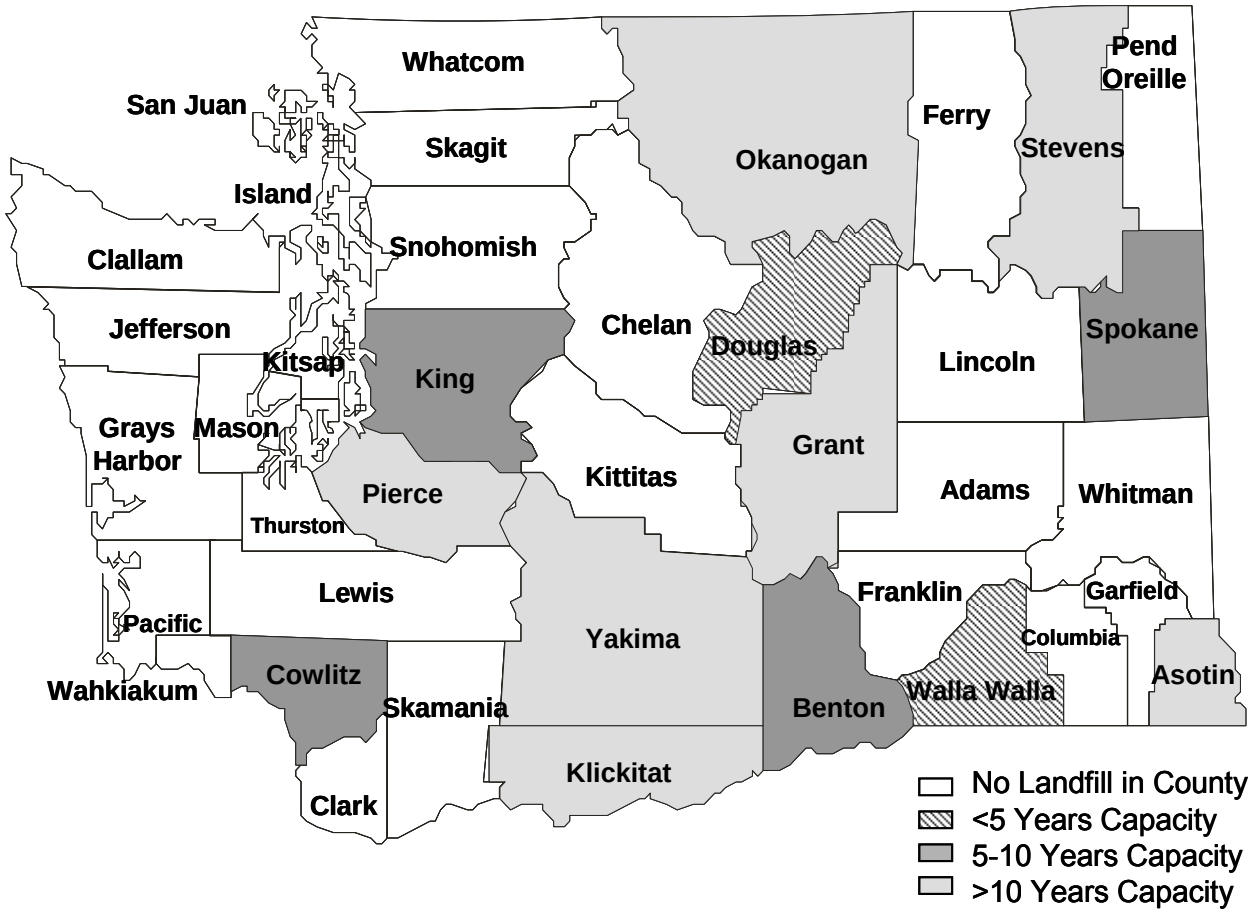
As of September 2007, 15 MSW landfills were operating in Washington State. Ecology determined the amount of remaining capacity for these landfills by asking them to report remaining permitted capacity, as well as the expected closure date. In 2007, the facilities estimated about 215 million tons, or almost 40 years, of capacity at the current disposal rate. 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, 8 have greater than 5 years of remaining permitted capacity. (See Table 5.9 for an estimated number of facilities with specified remaining years of life.)

**Table 5.9**
**Estimated Years to Closure for MSW Landfills**

| YEARS TO CLOSURE | % OF TOTAL REMAINING CAPACITY | NUMBER OF FACILITIES | PUBLIC | PRIVATE |
|---|---|---|---|---|
| Less than 5 years | < 0% | 4 | 3 | 1 |
| 5 to 10 years | > 8% | 4 | 4 | 0 |
| Greater than 10 years | > 92% | 7 | 5 | 2 |
| **TOTALS** | **100%** | **15** | **12** | **3** |

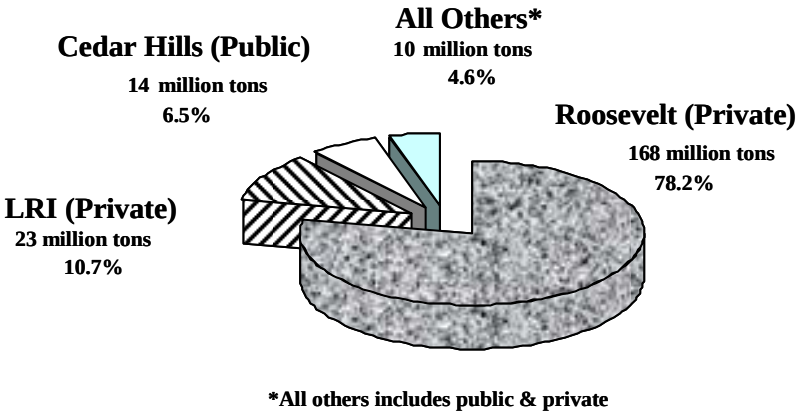
Map 5.A shows the counties and the remaining years of capacity of their MSW landfills.

**Map 5.A: Remaining Permitted MSW Landfill Capacity**
**(as of April 2006)**



Capacity numbers in 2007 indicated that about 92 percent of the remaining capacity was at landfills with more than 10 years before closure. Twelve of the 15 operating MSW landfills are publicly owned with about 11 percent of the remaining capacity (24 million tons). About 89 percent of the remaining permitted capacity (191 million tons) is at the three privately owned facilities, compared to 73 percent in 1993. The majority of the capacity, about 78 percent of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 11 percent of the statewide total capacity is at the LRI privately owned landfill in Pierce County, along with 6.5 percent at the publicly owned Cedar Hills landfill in King County. The remaining 4.5 percent of capacity is spread among the remaining 12 landfills in the state (see Figure 5.7).

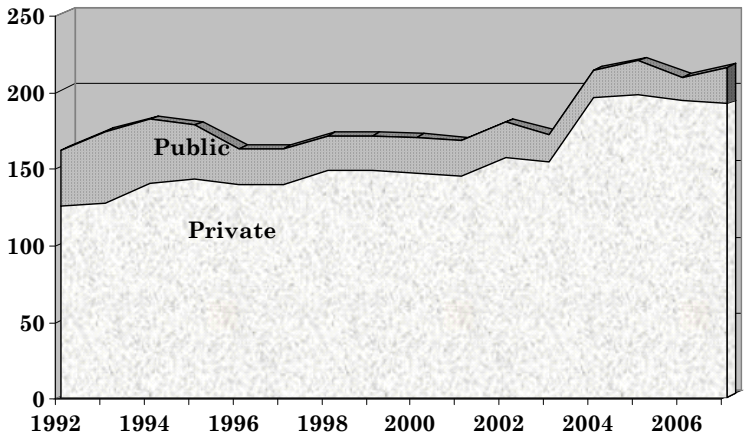
**Figure 5.7**
**2007 Remaining Permitted Capacity at MSW Landfills**




*All others includes public & private

The Oregon Department of Environmental Quality was asked about the remaining capacity at the three municipal solid waste landfills that receive waste from Washington. Estimates are over 200 million tons of remaining capacity, or between 80-100 years.

**Figure 5.8**
**Remaining Capacity MSW Landfills**
**(public/private in million tons)**




The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992 (see Figure 5.8).

Besides the amount of remaining capacity, the availability of that capacity needs to be considered. The Roosevelt Regional Landfill accepts waste from a wide variety of locations (see Map 5.C). In 2006, the facility received some type of solid waste from 27 counties in Washington, including the majority of the solid waste from fifteen counties. Waste was also received from Alaska, Oregon and British Columbia. For other counties that do not have landfills, Roosevelt or the Oregon landfills have become

the disposal option. Other landfills in the state accept the majority of waste from the county in which they operate. In order to reserve the capacity for local citizen needs, some are also using regional facilities for some of their disposal needs.

Ecology bases its 40-year estimate of total remaining permitted capacity on the amount of waste disposed of in MSW landfills in 2005. This amount will vary depending upon 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 that is 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

Three waste-to-energy facilities and incinerators statewide burned 326,584 tons of solid waste. Of that amount, 16,278 tons were wood waste at the Inland Empire Paper facility in Spokane, and 34,805 tons were waste at the Ponderay Newsprint Company in Pend Oreille County. These two incinerators do not burn MSW. In 2006, about 6 percent of solid waste was incinerated statewide. The highest percent of waste incinerated in the state was 12 percent in 1995. For the amounts and types of waste incinerated in 2006, using the new reporting categories, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

### *MSW Landfill Disposal vs. Incineration*

Table 5.10 shows a comparison of the amount of solid waste disposed of in MSW landfills and waste-to-energy facilities and incinerators in 2006.

**Table 5.10**
**Waste Disposed of in MSW Landfills and Incinerators in 2006**

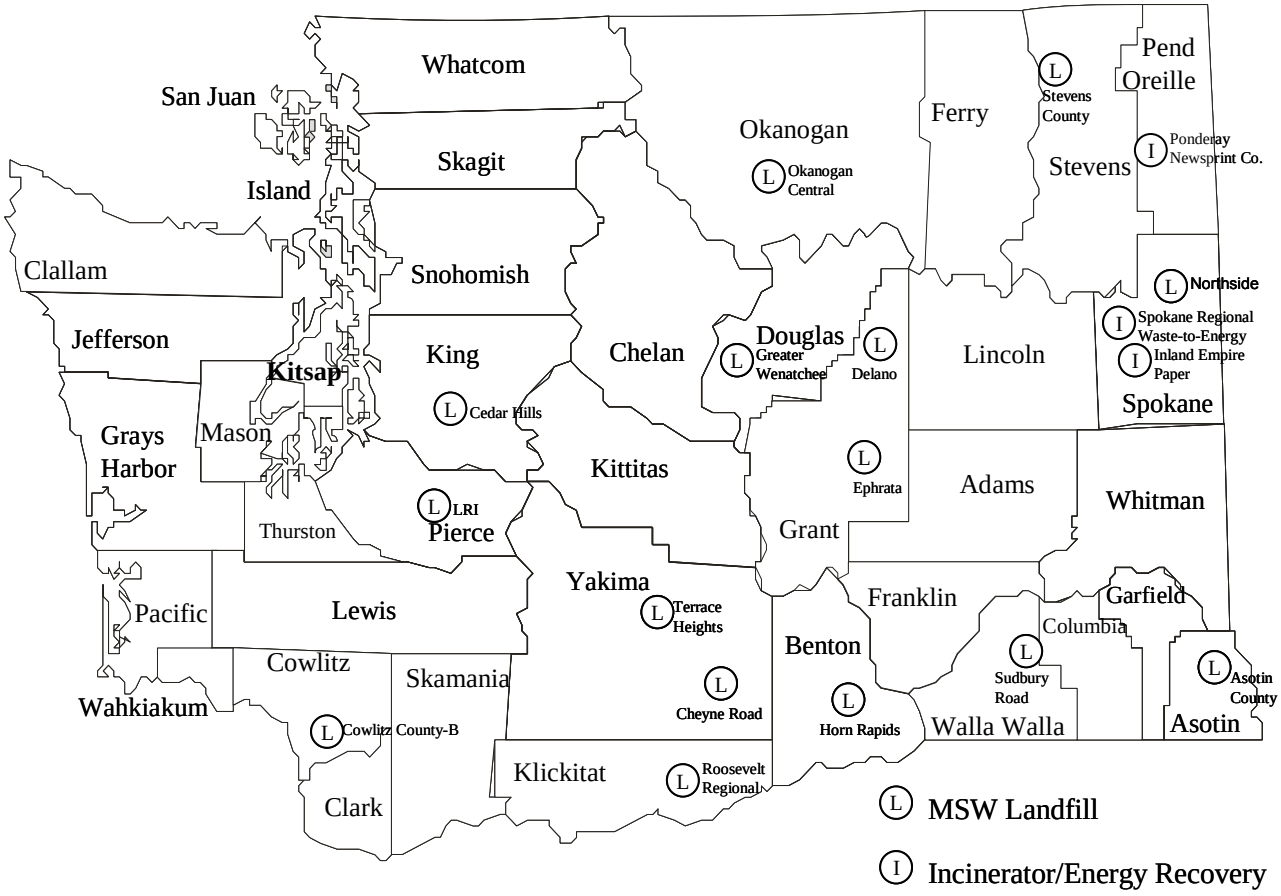
| FACILITY TYPE | TONS | PERCENT (%) |
|---|---|---|
| MSW Landfills | 5,398,008 | 94% |
| Incinerators | 326,584 | 6% |
| **TOTAL** | **5,724,592** | **100%** |

In 1991, 98 percent of the waste was disposed of in MSW landfills and 2 percent was incinerated. The highest percent of incinerated waste in the state, 12 percent, occurred in 1995. In 2006, about 6.5 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.

# Location of MSW Landfills and Energy Recovery Facilities

Map 5.B. shows the location of MSW landfills and energy-recovery facilities in Washington.

**Map 5.B: Location of MSW Landfills & Energy Recovery Facilities (as of October 2007)**




# 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 2006, the only facility of this type in the state, the Spokane Waste-to-Energy Recovery facility, sent 81,447 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 landfills 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 5.11. (For inert/demolition landfill data from 1992 - 2003 and inert landfill data for 2004 - 2006, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

**Table 5.11**
**Waste Types and Amounts Disposed at**
**Inert / Demolition Landfills (in tons)**

| WASTE TYPES | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|
| Demolition | 180,268 | 173,088 | 259,255 | 211,901 | 243,593 | 95,008 | 28,967 | 39,701 | 89,595 |
| Industrial | - | - | - | - | - | 81,474 | - | - | - |
| Inert | 252,506 | 344,444 | 180,337 | 199,256 | 112,457 | 163,435 | 379,298 | 944,153 | 973,855 |
| Wood | 156 | 336 | 536 | 167 | 445 | 1,082 | 2,526 | 402 | 610 |
| Asbestos | 4 | - | 3 | 3 | 6 | 11 | - | - | - |
| Ash (other than SPI) | - | - | - | - | - | - | - | 7,989 | 7,497 |
| PCS | 60,545 | 17,265 | 34,742 | 319,105 | 120,159 | 131,872 | 66,260 | 215,286 | 91,399 |
| Tires | 449 | 414 | 471 | 765 | 257 | 664 | - | - | - |
| Other | 600 | 605 | 2,039 | 2,646 | - | 2,668 | 33,472 | 324,110 | 68,609 |
| **TOTAL (tons)** | **494,528** | **536,155** | **477,383** | **733,843** | **476,917** | **476,214** | **509,927** | **1,531,641** | **1,231,565** |

For a more consistent look at limited purpose landfills over time, some waste categories were combined for Table 5.12. (For limited purpose landfill data from 1992 - 2006, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

**Table 5.12**
**Waste Types and Amounts Disposed at Limited Purpose Landfills (in tons)**

| WASTE TYPES | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|
| Demolition | 98,072 | 84,140 | 71,203 | 71,817 | 98,827 | 68,946 | 174,519 | 220,076 | 215,543 |
| Industrial | 225,779 | 262,021 | 278,224 | 325,114 | 282,747 | 325,863 | 262,560 | 420,285 | 257,297 |
| Inert | 112,714 | 136,352 | 205,902 | 202,577 | 195,303 | 157,431 | 36,155 | 53,597 | 39,928 |
| Wood | 7,700 | 8,853 | 3,205 | 6,841 | 2,747 | 8,420 | 32266 | 21,494 | 19,629 |
| Ash (other than SPI) | - | - | - | - | - | - | 533,201 | 409,376 | 138,616 |
| Sludge | - | 1,103 | - | - | - | - | - | - | - |
| Asbestos | 1,058 | 1,549 | 1,654 | 1,282 | 1,311 | 1,302 | 1,581 | 1,624 | 1,420 |
| PCS | 56,407 | 8,837 | 7,159 | 13,222 | 9,888 | 4,890 | 20,399 | 224,064 | 32,836 |
| Soils (uncont) | - | - | - | - | - | - | - | 13,706 | 29,006 |
| Tires | 559 | 59 | 25 | 41 | 59 | 81 | 713 | 690 | 423 |
| Other | 124,607 | 66,833 | 79,291 | 24,698 | 14,402 | 19,737 | 13,708 | 23,022 | 25,390 |
| **TOTAL (tons)** | **628,896** | **569,747** | **646,662** | **645,592** | **605,284** | **586,670** | **1,075,102** | **1,387,934** | **760,088** |

The woodwaste landfill category no longer exists under chapter 173-350 WAC, *Solid Waste Handling Standards*. (For woodwaste 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 received from out of county. Six of the 16 active MSW landfills reported receiving solid waste from other counties in 2006.

Some of the MSW movement was because of closer proximity to a neighboring county's landfill. This was especially true for the 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.

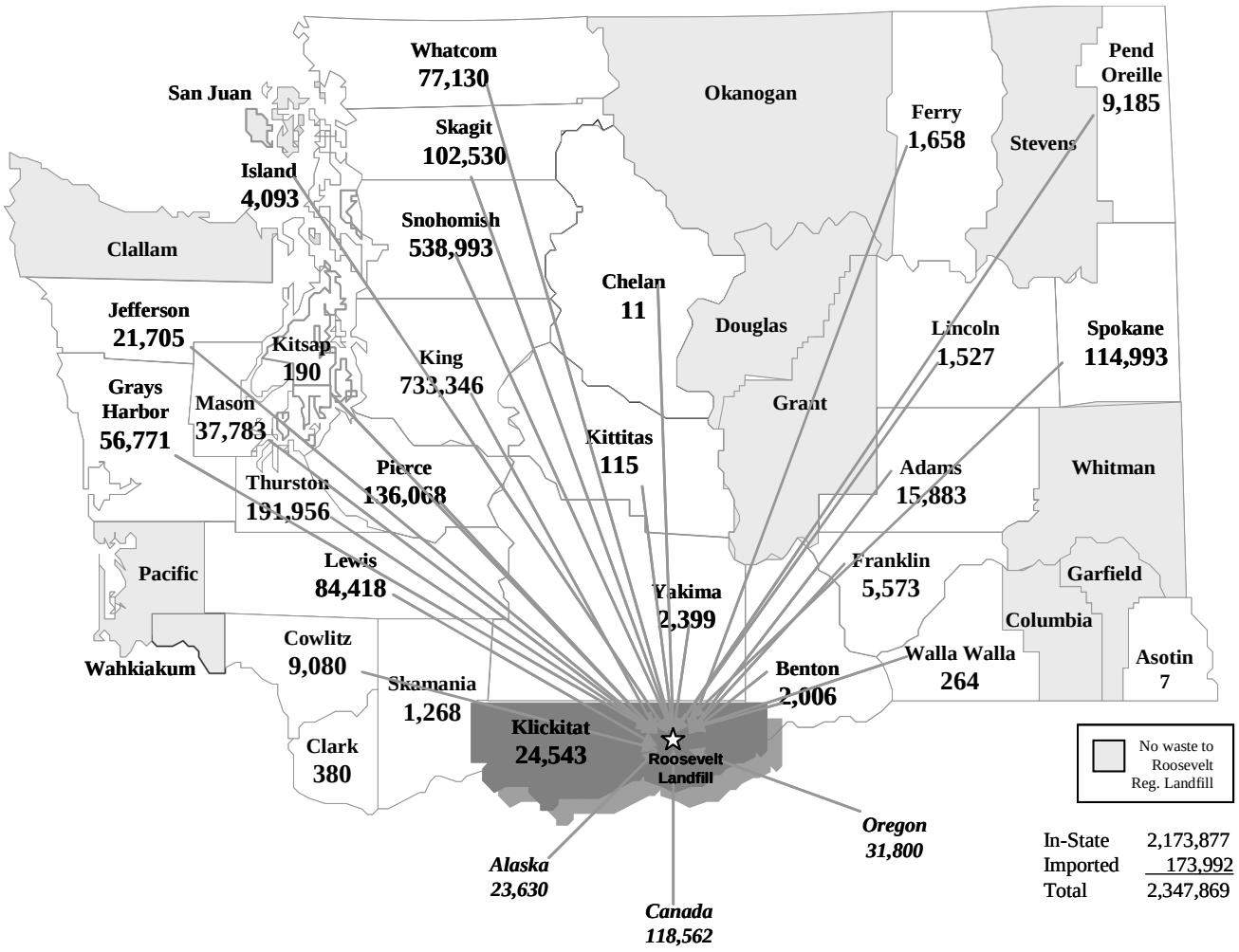
With the closure of many local landfills, Roosevelt Regional Landfill in Klickitat County and Oregon's regional landfills have become the chosen disposal options. The Roosevelt Regional Landfill received some type of solid waste from 28 of the 39 Washington counties and also from

out of state and out of country (see Map 5.C). 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. Twelve of the 29 counties rely on Roosevelt for the majority of their MSW disposal, and two other counties send a significant portion of their MSW to Roosevelt.

Eight counties and the City of Seattle send the majority of their MSW to Oregon facilities. Three other counties send a significant amount of waste to Oregon. Much of the waste that goes to the Columbia Ridge Landfill is Oregon is waste other than MSW.

You can find spreadsheets that identify the disposal location, type, and amount of waste for each county for 2006 (and previous years) at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

**Map 5.C: 2006 Solid Waste to Roosevelt Regional Landfill (in Tons)**



# 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 2006, a total of 234,091 tons of solid waste, about 3.0 percent of the waste disposed of and incinerated in Washington, was imported from beyond 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 5.13**
**Out-of-State Waste Disposed in Washington**

Table 5.13 shows the types of waste received from out of state for disposal. The majority of this waste (173,992 tons) went to Roosevelt Regional Landfill. Of that, 118,569 tons came from British Columbia, with the remainder from Alaska (23,630 tons) and Oregon (31,800 tons). Sudbury Road Landfill in Walla Walla County received 55 tons of MSW from Oregon.

| Type of Waste | 1991 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|
| **Municipal Solid Waste** | 24,475 | 112,097 | 77,803 | 144,396 | 147,746 | 166,634 |
| **Demolition** | 1,412 | 6,104 | 3,824 | 3,477 | 2,962 | 3,212 |
| **Industrial** | - | 42,953 | 30,584 | 41,171 | 55,085 | 44,725 |
| **Inert** | - | 1,097 | - | 59 | 269 | 65 |
| **Woodwaste** | 208 | 35 | 28 | 1 | - | - |
| **Sludge** | 36 | - | 621 | - | 19 | 10,883 |
| **Asbestos** | - | 350 | 1,245 | 304 | 831 | 283 |
| **Petroleum Contaminated Soils** | - | 1,769 | 3,114 | 7,957 | 4,801 | 3,650 |
| **Tires** | - | 1,162 | 5,157 | 4,694 | 1,813 | 3,054 |
| **Medical** | - | - | - | - | - | - |
| **Other** | - | 359 | 508 | 728 | 1,332 | 1,585 |
| **TOTAL** | **26,131** | **165,935** | **122,884** | **202,787** | **214,858** | **234,091** |

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.

In addition to the MSW landfills, the Spokane Regional Waste-to-Energy Facility received 146 tons of MSW from Idaho. Graham Road Recycling and Disposal in Spokane County received 7,350 tons and the Weyerhaeuser limited purpose landfill in Cowlitz County received 23,335 tons. (See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for imported totals for 1991 - 2006)

## Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2006, a total of 1,940,759 tons of waste created in Washington was disposed of in Oregon landfills, an increase from 705,608 tons in 1992. Table 5.14 compares the waste amounts and types exported and imported.
(See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for exported totals for 1993 - 2006.)

**Table 5.14**
**Comparison of Imported-to-Exported**
**Waste for all Solid Waste Facilities**

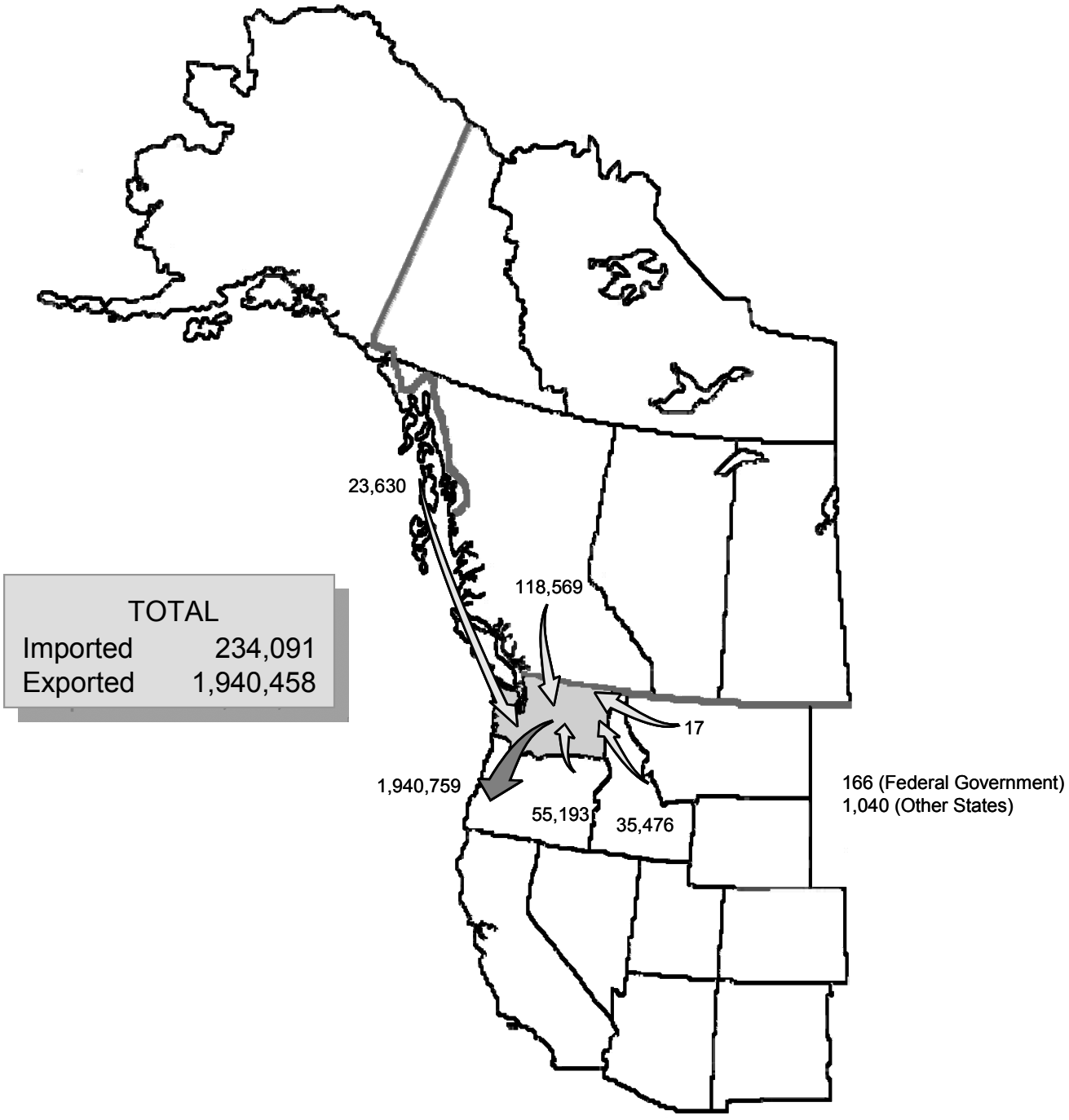
| TYPE OF WASTE | IMPORTED | | EXPORTED | |
|---|---|---|---|---|
| | 1991 | 2006 | 1993 | 2006 |
| **Municipal Solid Waste** | 24,475 | 166,634 | 710,515 | 1,361,822 |
| **Demolition** | 1,412 | 3,212 | 2,245 | 273,842 |
| **Industrial** | - | 44,725 | 864 | 117,044 |
| **Inert** | 208 | 65 | - | - |
| **Woodwaste** | 36 | - | - | 119 |
| **Ash (other than SIA)** | - | - | - | - |
| **Sludge** | - | 10,883 | - | - |
| **Asbestos** | - | 283 | 1,623 | 22,930 |
| **Petroleum Contaminated Soils** | - | 3,650 | 22,308 | 163,792 |
| **Other Contaminated Soils** | - | - | - | 880 |
| **Tires** | - | 3,054 | - | 163 |
| **Medical Waste** | - | - | - | 166 |
| **Other** | - | 1,585 | 18,512 | - |
| **TOTAL** | **26,131** | **234,091** | **756,067** | **1,940,758** |

Major exporters of MSW in Washington included the City of Seattle, Columbia County, Clark County, Franklin County, Island County, Kitsap County, Pacific County, San Juan County, Skamania County, and Whitman County, along with portions of Benton County, Snohomish County, and Whatcom County. Reasons for exporting out of state have to do with the closure of local landfills and the negotiation of favorable long-haul contracts.

In addition to reports from MSW landfills in Oregon, waste tire data gathered through the recycling survey showed 27,641 tons of tires were disposed in Oregon. This disposal has occurred

over the lasts several years but the tonnage was not included until the 2005 report. Additional tires are disposed in Montana but the information has not been available.

**Map 5.D: Imported and Exported Waste (2006)**

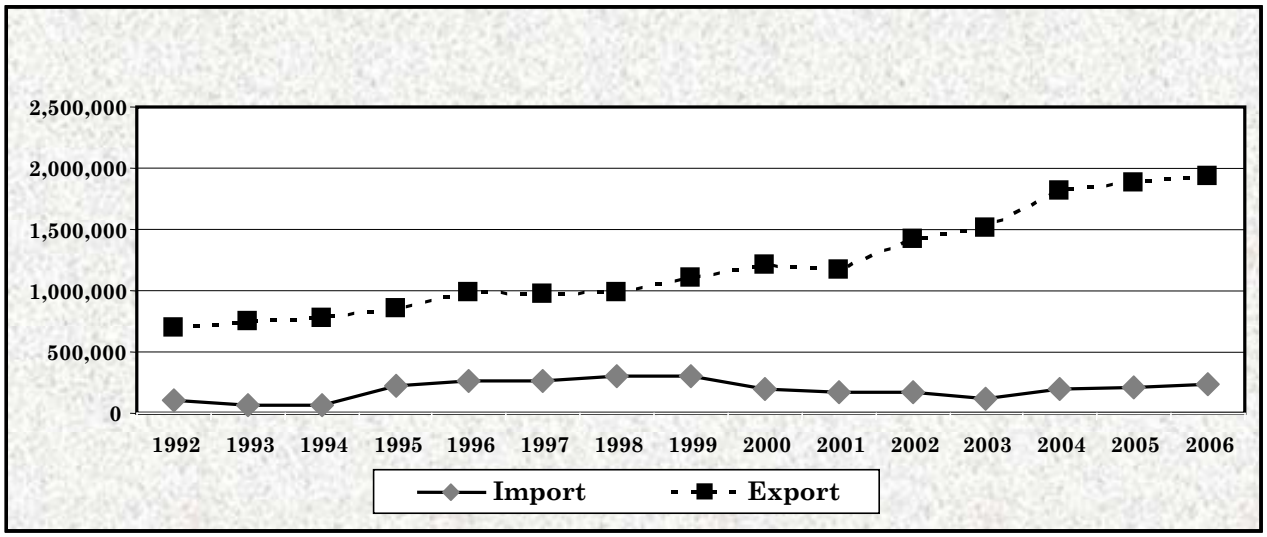


# Trends in Interstate Waste Movement for Washington

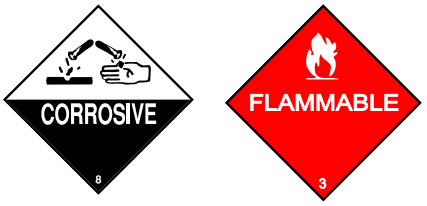
The first significant movement of waste across Washington State boundaries started in 1991. In mid-1991, the City of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington, accepting waste from British Columbia, Idaho, and California. Map 5.D identifies the sources and amounts of waste that were imported and exported in 2005.

As can be seen in Figure 5.9, Washington exports have been much higher than imports since 1991. With the loss of the California contract at Roosevelt Regional Landfill, waste imports dropped from a high of 307,850 in 1998, to 234,091 tons in 2006. Exported waste amounts increased in 2005, with over eight times as much waste being exported to Oregon's landfills (Columbia Ridge, Wasco, and Finley Buttes) as is imported to Washington for incineration or disposal.

**Figure 5.9**
**Trend of Imported/Exported Solid Waste**



# Chapter VI
# 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 collection in 2006 was over 32 million pounds.
- The average amount of HHW disposed of per participant was 79 pounds, and per capita was 2.64 pounds.
- Over 3.3 percent of Washington residents used a fixed facility or collection event to remove hazardous waste from their household, about 8.6 percent of all households.
- The counties that collected the most CESQG waste per capita were Yakima, Cowlitz, Chelan, Asotin, and Lewis.
- The counties that collected the most used oil per capita were Mason, Stevens, San Juan, Yakima, Asotin, and Cowlitz.
- The ten categories of collected waste that increased the most from 2005 are Acids (aerosols), Mercury (switches, etc.), Oil w/ chlorides, Antifreeze, Flammable Gas Poison (aerosols), Electronics, Flammable Solids, Mercury (pure), Flammable Liquids Poison, and Flammable Liquids (aerosols).
- 83.2 percent of all HHW was recycled, reused, or used for energy recovery.

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

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

It should be noted the data in this chapter are only a portion of the MRW waste stream. The MRW data presented here is reported through local governments. *Chapter V Solid Waste Generation, Disposal and Recycling in Washington State* includes additional data statewide.

# Funding

Washington State's 1988 Model Toxics Control Act provides a large part of the funding for public MRW programs through the Coordinated Prevention Grant program. Many jurisdictions use funds to plan and carry out local MRW programs.

By 1991 all local governments in the State of Washington had submitted MRW plans. Every local MRW plan includes sections on CESQG technical and disposal assistance, MRW public education, MRW enforcement, and HHW collection.

## Accuracy of Data Collection

Ecology created and circulates a standard reporting form to all MRW programs. Nonetheless, 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.

**2004 –** Some reporting errors have been identified since the 2004 report numbers were published. The 2004 HHW numbers and consequently the overall MRW number for 2004 have changed dramatically. One facility over reported the total amount of latex paint collected by 3 million pounds. Another facility reported the total amount of HHW that came to its facility from all sources (versus the facilities county of residence) in 2004. This same facility, due to the afore mentioned reporting confusion and a contract change saw its HHW number go from 4,068,503 pounds collected in 2004 to 4,395 pounds collected in 2005. The actual number for 2004 is impossible to know for what was collected in the county it resides. These two reporting anomalies account for upwards of 7 million pounds over reported in 2004 in the HHW and overall MRW categories.[31]

**2005 -** Columbia County did not report their used oil collections so the number from the previous year was carried over.

Lincoln County experienced limited quantities and stored their MRW. They only submitted HHW quantities, participation numbers, and costs from the past three years. This data was averaged over the time period to establish the numbers for 2005. In addition, Klickitat County's participation numbers seem high but the county could not confirm this for us.

One facility in King County reported all CESQG waste received at its facility from all Washington State counties it services for CESQG collections. These numbers were backed out of the King County total based on other annual reports submitted to Ecology.

**2006 –** Lincoln County did not report in 2006 (see 2005 above). Except for used oil collection sites, Clallam County did not have anything further to report because they chose not to conduct the

[31] See Table 6.2 for a year by year breakdown of HHW, CESQG, and overall MRW pounds collected back to 1999. By accounting for the reporting confusion mentioned above, the numbers are more in line with overall collection trends and explain the large jump seen from 2003 to 2004.

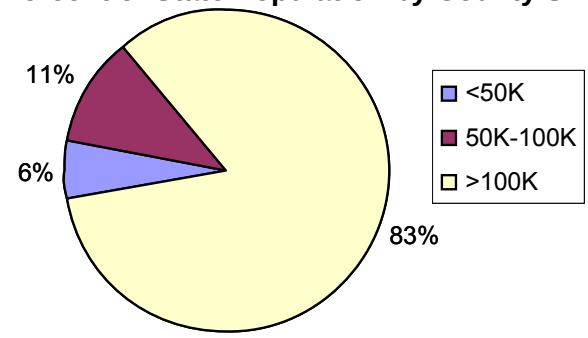
collection events in 2006 that they normally do. Clallam County was anticipating a fixed facility to come on-line in 2006, but the facility did not open until early 2007. If using 2005 collection totals for Clallam and Lincoln Counties, approximately 110,000 pounds of MRW did not get collected or reported in 2006.

## Year 2006 Data

This year's report focuses on 2006 data with some comparisons to the data published in previous years' reports. In an effort to provide useful information for individual programs, it was determined that data would be presented in categories by county size.

Figure 6.1 and Table 6.1 indicates a distinction between counties with a population of less than 50 thousand, of 50 to 100 thousand, and of more than 100 thousand.

**Figure 6.1**
**Percent of State Population by County Size**




In Washington State there are 42 programs that manage MRW. These programs include all 39 counties.

Many HHW collection systems are approaching stability. Permanent fixed facilities now service most of the state. In 2006, Chelan, Clallam, Douglas, Ferry, Garfield, San Juan, Skamania, and Wahkiakum counties did not have fixed facilities. San Juan County had a fixed facility, but had to close in June of 2005. San Juan County does plan to reopen at a later date. Garfield residents use the facility in Asotin County and Cowlitz County conducts a mobile unit in Wahkiakum County. Chelan, Douglas, Ferry, and Skamania counties conduct collection events but may convert to fixed facilities in the future. The City of Port Angeles opened a new facility early in 2007 to serve Clallam County residents. Also, Stevens County is planning one new facility and Pierce County is planning on two new facilities. Mason County is looking to expand its current facility. Cowlitz County will be replacing its current facility at another location.

Collection services for CESQGs continue to expand statewide. For 2006, 21 fixed facilities serviced CESQG's and 5 different counties provided 27 collection events for CESQGs. The majority of these events were held in Clark County and were open to households, as well as, CESQG's.

**Table 6.1**
**Individual County Population by Size**

| <50K | | 50K-100K | | >100K | |
|---|---|---|---|---|---|
| Adams | 17,300 | Chelan | 70,100 | Benton | 160,600 |
| Asotin | 21,100 | Clallam | 67,800 | Clark | 403,500 |
| Columbia | 4,100 | Cowlitz | 96,800 | King * | 1,256,600 |
| Douglas | 35,700 | Franklin | 64,200 | Kitsap | 243,400 |
| Ferry | 7,500 | Grant | 80,600 | Pierce | 773,500 |

| <50K | |
|---|---|
| Garfield | 2,400 |
| Jefferson | 28,200 |
| Kittitas | 37,400 |
| Klickitat | 19,800 |
| Lincoln | 10,200 |
| Okanogan | 39,800 |
| Pacific | 21,500 |
| Pend Oreille | 12,300 |
| San Juan | 15,700 |
| Skamania | 10,600 |
| Stevens | 42,100 |
| Wahkiakum | 3,900 |
| Whitman | 42,800 |
| **<50K total** | **372,400** |

| 50K-100K | |
|---|---|
| Grays Harbor | 70,400 |
| Island | 77,200 |
| Lewis | 72,900 |
| Mason | 53,100 |
| Walla Walla | 57,900 |
| **50K-100K total** | **711,000** |

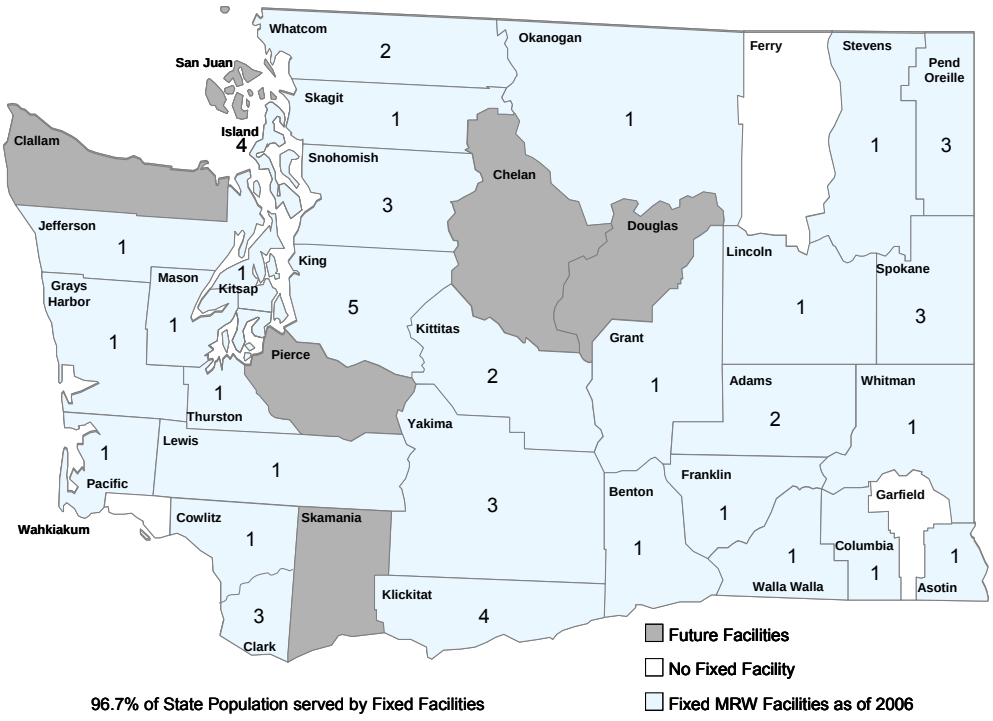
| >100K | |
|---|---|
| Skagit | 113,100 |
| Snohomish | 671,800 |
| Spokane | 443,800 |
| Thurston | 231,100 |
| Whatcom | 184,300 |
| Yakima | 231,800 |
| Seattle * | 578,700 |
| **>100K total** | **5,292,200** |

*** King excludes Seattle**

**State Total 6,375,600**

Figure 6.2 shows which counties have permanent facilities, the number of facilities in each county, and which counties are likely to develop a permanent facility in the future.

**Figure 6.2**
**55 MRW Facilities as of 2006**



# MRW Collected

As shown in Table 6.2, Washington collected approximately 15.2 million pounds of HHW, 10 million pounds of used oil (UO) from collection sites (includes antifreeze and oil filters), and 7.1 million pounds of CESQG waste, for a total of over 32 million pounds of MRW during 2006. The two most significant trends seen since 2004 is the increase of CESQG waste collected and the decrease in Used Oil collected. The increase in CESQG waste collected is largely due to more focused efforts at collecting CESQG wastes by the King County Local Hazardous Waste Program and Tacoma/Pierce County Health Department. In general, the increases seen in collection totals are attributed to increased collections at the Phillip Services (Kent Facility) in King County and the Emerald Services facility in Pierce County. The drop seen in Used Oil collections needs to continually be monitored. There are more cars on the road than ever, so one would expect this category to keep increasing. The recent trend to changing ones oil every 5,000 miles compared to 3,000 miles may be impacting this category.

**Table 6.2**
**Total Pounds per Waste Category**
**Years 1999 - 2006**

| 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 |

* An estimated 7 million pounds of HHW was over reported in 2004. These numbers reflect a change from the numbers shown in the 2004 report.

## Collection by Waste Category and Type

As shown in Table 6.3, the dominant types of MRW collected in 2006 were non-contaminated used oil, antifreeze, latex and oil-based paint, lead-acid batteries, and flammable liquids. These totals include used oil and antifreeze collected at all collection sites. These six specific waste types accounted for 65.3 percent of the estimated 32 million pounds of MRW collected in 2006.

Table 6.4 provides summary information on total pounds of MRW collected from HHW and CESQG categories by waste types.

**Table 6.3**
**Six Most Dominant MRW Waste Types Collected in 2006**

| Waste Type | Total Lbs. |
|---|---|
| Non-Contaminated Used Oil | 10,309,307 |
| Antifreeze | 5,157,745 |
| Latex Paint | 3,833,786 |
| Oil-based Paint | 2,947,699 |
| Lead-Acid Batteries | 2,312,866 |
| Flammable Liquids | 1,718,290 |
| **TOTAL** | **21,121,290** |

**Table 6.4**
**Total Pounds of MRW Collected by Waste Category in 2006**

| WASTE TYPE | HHW | CESQG | TOTAL |
|---|---|---|---|
| Acids | 137,492.80 | 24,098.00 | 161,590.80 |
| Acids (aerosol cans) | 1,830.00 | 25.00 | 1,855.00 |
| Antifreeze | 472,886.00 | 4,684,859.00 | 5,157,745.00 |
| Antifreeze Off-site* | 0.00 | 260,382.00 | 260,382.00 |
| Bases | 144,782.00 | 26,672.00 | 171,454.00 |
| Bases, Aerosols | 2,249.00 | 30.5 | 2,279.50 |
| Batteries (lead acid) | 2,286,696.00 | 26,170.00 | 2,312,866.00 |
| Batteries (small lead acid) | 4,718.00 | 9,386.00 | 14,104.00 |
| Batteries (dry cell) | 270,128.00 | 10,405.00 | 280,533.00 |
| Batteries (nicad/NIMH/lithium | 14,207.00 | 3,608.00 | 17,815.00 |
| Electronics | 898,037.00 | 40,907.00 | 938,944.00 |
| CRT's | 558,552.00 | 43,672.00 | 602,224.00 |
| Chlorinated Solvents | 4,932.00 | 6,961.00 | 11,893.00 |
| Flammable Solids | 66,824.00 | 14,657.00 | 81,481.00 |
| Flammable Liquids | 930,259.00 | 788,031.00 | 1,718,290.00 |
| Flammable Liquids, Aerosols | 28,446.00 | 5,184.00 | 33,630.00 |
| Flammable Liquids Poison | 132,788.00 | 3,843.30 | 136,631.30 |
| Flammable Liquid Poison, Aerosols | 6,077.00 | 3,686.00 | 9,763.00 |
| Flammable Gas (butane/propane) | 135,415.00 | 1,635.00 | 137,050.00 |
| Flammable Gas Poison | 21.00 | 0.00 | 21.00 |
| Flammable Gas Poison, Aerosols | 95,107.80 | 4,182.50 | 99,290.30 |

| WASTE TYPE | HHW | CESQG | TOTAL |
|---|---|---|---|
| Latex Paint | 3,713,914.00 | 119,872.00 | 3,833,786.00 |
| Latex Paint, Contaminated | 1,025,324.00 | 38,144.00 | 1,063,468.00 |
| Mercury (pure) | 1,590.30 | 59.00 | 1,649.30 |
| Mercury (switches) | 818.98 | 12.82 | 831.80 |
| Mercury (fluorescent lamps) | 2.73 | 1.43 | 4.16 |
| Oil-Based Paint | 2,684,818.60 | 262,881.00 | 2,947,699.60 |
| Oil-Based Paint, Contaminated | 384,833.00 | 0.00 | 384,833.00 |
| Oil Contaminated | 49,921.00 | 0.00 | 49,921.00 |
| Oil Filters | 50,267.36 | 57,463.00 | 107,730.36 |
| Oil Filters Off-site* | 0.00 | 50,474.00 | 50,474.00 |
| Oil Filters Crushed | 5,025.00 | 10,983.00 | 16,008.00 |
| Oil Non-Contaminated | 1,607,202.00 | 75,473.00 | 1,682,675.00 |
| Oil Non-Contaminated Off-site ***** | 0.00 | 8,315,776.00 | 8,315,776.00 |
| Oil with Chlorides | 4,573.00 | 39,411.00 | 43,984.00 |
| Oil with PCBs | 3,422.00 | 0.00 | 3,422.00 |
| Other Dangerous Waste | 243,608.86 | 801,378.00 | 1,044,986.86 |
| Organic Peroxides | 2,531.00 | 89.00 | 2,620.00 |
| Oxidizers | 54,734.00 | 2,633.50 | 57,367.50 |
| Pesticide / Poison Liquid | 333,917.40 | 4,595.50 | 338,512.90 |
| Pesticide / Poison Solid | 216,671.00 | 14,332.50 | 231,003.50 |
| Reactives | 6,609.00 | 180.00 | 6,789.00 |
| **MRW TOTAL** | **16,581,230.82** | **15,752,153.05** | **32,333,383.87** |

- Used oil collection sites other than a collection facility or event

## Disposition of MRW Waste

The disposition of MRW is generally well managed. Most MRW is recycled or used for energy recovery. Very little is safe for solid waste disposal and seven percent of all MRW is disposed of at a hazardous waste landfill or incinerator. See Figure 6.3 for final disposition of MRW between recycled, reused, energy recovery, hazardous waste landfill or incineration, solid waste landfill, and disposal through a waste water treatment plant.

## MRW Data

Table 6.5 shows various data by county. 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.

**Figure 6.3**
**MRW Final Disposition**

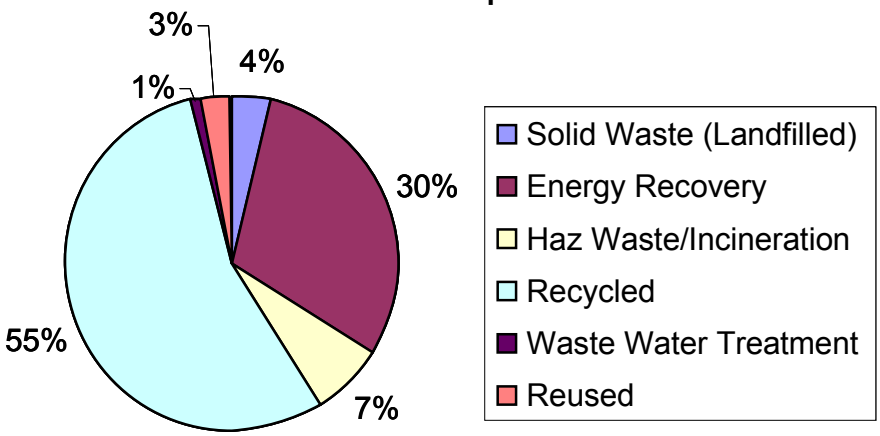



**Table 6.5**
**Various Data by County**

| COUNTY | HOUSING UNITS | HHW Partici-pants | % Participant / Housing Units | HHW Cost / Participant | HHW lbs / Participant | HHW Total lbs | HHW, SQG, & Used Oil Total lbs |
|---|---|---|---|---|---|---|---|
| **Adams** | 6,222 | 125 | 2% | $22.25 | 29.97 | 3,746.00 | 29,653.00 |
| **Asotin** | 9,625 | 1,051 | 10.9% | $63.29 | 68.61 | 72,116.50 | 143,851.50 |
| **Benton** | 64,062 | 4,510 | 7% | CNR | 51.04 | 246,088.35 | 508,694.95 |
| **Chelan** | 33,033 | 816 | 2.5% | $24.71 | 94.42 | 80,095.10 | 159,619.12 |
| **Clallam** | 33,689 | 0 | 0 | 0 | 0 | 6,104.00* | 200,966.00 |
| **Clark** | 159,907 | 14,628 | 9.1% | $25.58 | 134.87 | 1,973,001.59 | 2,043,898.59 |
| **Columbia** | 2,156 | 20 | .9% | $60.05 | 122.30 | 2,446.00 | 2,446.00** |
| **Cowlitz** | 41,756 | 1,628 | 3.9% | 70.57 | 185.65 | 302,243.00 | 667,180.00 |
| **Douglas** | 14,338 | 470 | 3.3% | $67.59 | 147.79 | 69,420.01 | 124,851.01 |
| **Ferry** | 4,021 | 24 | .6% | $25.20 | 46.50 | 1,116.00 | 9,322.00 |
| **Franklin** | 21,439 | 171 | .8% | $29.19 | 132.36 | 22,634.00 | 195,645.00 |
| **Garfield** | 1,308 | Inc. with Asotin | Inc. with Asotin | Inc. with Asotin | Inc. with Asotin | Inc. with Asotin | Inc. with Asotin |
| **Grant** | 32,086 | 526 | 1.6% | $108.45 | 230.01 | 120,987.42 | 130,744.42 |
| **Grays Harbor** | 34,639 | 1,454 | 4.2% | $102.03 | 71.80 | 104,399.03 | 301,531.17 |
| **Island** | 36,891 | 2,445 | 6.6% | $83.55 | 163.00 | 375,952.37 | 577,146.37 |
| **Jefferson** | 15,914 | 1,187 | 7.5% | $60.63 | 41.82 | 49,644.34 | 124,414.36 |
| **King** | 514,277 | 53,510 | 10.4% | $46.15 | 70.90 | 4,752,054.10 | 6,679,650.10 |
| **Seattle** | 288,723 | 16,622 | 5.8% | $89.09 | 87.18 | 1,449,108.40 | 1,626,698.43 |
| **Kitsap** | 100,637 | 6,574 | 6.5% | $106.43 | 104.31 | 685,797.30 | 1,113,707.30 |
| **Kittitas** | 18,565 | 479 | 2.6% | $146.29 | 340.40 | 163,052.80 | 253,695.80 |
| **Klickitat** | 9,672 | 8,840 | 87.7% | $5.47 | 12.51 | 106,098.00 | 134,795.00 |

| COUNTY | HOUSING UNITS | HHW Partici-pants | % Participant / Housing Units | HHW Cost / Participant | HHW lbs / Participant | HHW Total lbs | HHW, SQG, & Used Oil Total lbs |
|---|---|---|---|---|---|---|---|
| **Lewis** | 32,582 | 1,442 | 4.4% | $65.44 | 132.38 | 190,894.12 | 437,096.25 |
| **Lincoln** | 5,660 | 0 | 0 | 0 | 0 | 0 | 0^ |
| **Mason** | 28,798 | 7,171 | 24.9% | $14.70 | 16.97 | 121,712.02 | 700,881.02 |
| **Okanogan** | 20,472 | 200 | 1% | $200.10 | 64.20 | 12,840.00 | 42,313.02 |
| **Pacific** | 14,862 | 284 | 1.9% | $83.10 | 67.82 | 19,261.00 | 88,147.00 |
| **Pend Oreille** | 7,235 | 1,397 | 19.3% | $88.87 | 45.68 | 63,819.36 | 92,309.36 |
| **Pierce** | 312,496 | 9,756 | 3.1% | $51.88 | 84.46 | 824,062.00 | 6,402,998.10 |
| **San Juan** | 11,152 | 259 | 2.3% | $194.29 | 191.54 | 49,609.25 | 109,235.25 |
| **Skagit** | 47,421 | 3,585 | 7.6% | $47.10 | 105.40 | 377,852.16 | 598,420.16 |
| **Skamania** | 5,241 | 238 | 4.5% | $77.52 | 121.08 | 28,819.00 | 62,699.00 |
| **Snohomish** | 267,707 | 17,131 | 6.4% | $38.17 | 109.63 | 1,878,088.00 | 3,485,534.40 |
| **Spokane** | 190,153 | 32,852 | 17.3% | $16.67 | 42.33 | 1,390,912.00 | 1,996,306.00 |
| **Stevens** | 19,232 | 475 | 2.5% | $77.64 | 174.27 | 82,781.00 | 314,751.00 |
| **Thurston** | 98,376 | 11,914 | 12.1% | $59.35 | 55.00 | 655,320.62 | 968,184.62 |
| **Wahkiakum** | 1,969 | Inc. w/ Cowlitz | . w/ Cowlitz | Inc. w/ Cowlitz | Inc. w/ Cowlitz | Inc. w/ Cowlitz | Inc. w/ Cowlitz |
| **Walla Walla** | 22,790 | 1,901 | 8.4% | $65.73 | 43.09 | 81,920.50 | 137,516.50 |
| **Whatcom** | 84,820 | 6,022 | 7.1% | $53.48 | 35.04 | 211,005.11 | 460,327.95 |
| **Whitman** | 18,105 | 1,550 | 8.6% | $27.73 | 31.65 | 49,063.50 | 67,511.50 |
| **Yakima** | 83,501 | 2,379 | 2.8% | $117.38 | 94.45 | 224,715.70 | 1,329,384.20 |
| **STATEWIDE** | **2,715,532** | **213,276** | **7.85%** | **N/A** | **79.00** | **16,848,779.66** | **32,322,127.25** |

* Clallam County did not hold any collections in 2006. They were expecting the new fixed facility would be open – it opened in early 2007. 2005 totals for MRW collected was 302,227.00 pounds.

** Used Oil collections were not reported. 2005 Used Oil collected was 8,140.00

^ Lincoln County typically reports every three years or when they have enough MRW to cost effectively ship. The previous three year average (2003-2005) for total amount of MRW collected was 9164.67 pounds

CNR - Costs not reported

# Household Hazardous Waste (HHW)

## Participants per Housing Unit

Counties that exhibit 10 percent or higher of participants per housing unit are either performing excellent public education to encourage the use of facilities or events, have very convenient locations for their collection facilities, or both. The participation number and rate for Klickitat County seem high and was 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 of scale both in quantities received and in disposition options. Also, there are differences in service levels of the basic program, accounting differences, and errors. This data does, however, provide an idea of what is possible and an incentive to contact those counties that appear to operate efficiently.

## HHW Pounds per Participant

The average pounds collected statewide per participant for HHW was 79.

Table 6.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2004, 2005, and 2006. It is noteworthy that in 2004 both King and Snohomish counties have large collection numbers per capita. In 2004 Pacific County collected 292,093 pounds of HHW with only 180 participants, which comes to an average of 1,623 pounds per participant, or 13.75 pounds per capita. This number seems high, and Ecology could not verify it.

**Table 6.6**
**High Collections of HHW (no Used Oil Sites) Pounds per Capita by County in 2004-2006**

| HHW 2004 | | |
|---|---|---|
| **County** | **Size** | **Lbs./ Capita** |
| Pacific | <50K | **13.75** |
| King | <100K | **9.39** |
| Kittitas | <50K | **6.49** |
| Snohomish | <100K | **6.20** |
| Asotin | <50K | **4.45** |

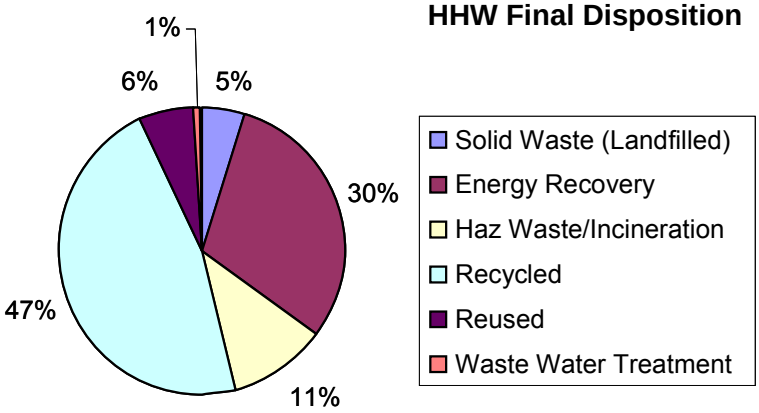
| HHW 2005 | | |
|---|---|---|
| **County** | **Size** | **Lbs./ Capita** |
| Island | 50-100K | **5.51** |
| Pend Oreille | <50K | **5.42** |
| Thurston | >100K | **5.41** |
| Asotin | <50K | **4.63** |
| Spokane | >100K | **4.51** |

| HHW 2006 | | |
|---|---|---|
| **County** | **Size** | **Lbs./ Capita** |
| Klickitat | <50K | **5.35** |
| Pend Oreille | <50K | **5.18** |
| Clark | >100K | **4.89** |
| Island | 50-100K | **4.87** |
| Kittitas | <50K | **4.36** |

## HHW Disposition

Figure 6.4 shows the final disposition of all HHW collected throughout Washington State.

**Figure 6.4**
**HHW Final Disposition**




# Conditionally Exempt Small Quantity Generator (CESQG)

Twenty-one local MRW programs collect CESQG waste from the public. Counties that sponsor CESQG waste collections are:

| | | | | |
|---|---|---|---|---|
| Asotin | Douglas | King | Pierce | Yakima |
| Benton | Grant | Kitsap | Skagit | |
| Chelan | Grays Harbor | Kittitas | Snohomish | |
| Clark | Island | Lewis | Thurston | |
| Cowlitz | Jefferson | Okanogan | Whatcom | |

Yakima County was responsible for over 33 percent of the total statewide volume of publicly collected CESQG waste. This is largely due to Yakima County's policy of not charging businesses to dispose of or recycle their waste. This does not take into account the numbers of CESQG waste collected privately.

Also included in CESQG waste totals for year 2006 are data from Emerald and Philip Services (private collections). These types of collections by-pass the public system with each company servicing small businesses directly. Emerald Services primarily serves Pierce County and Philip Services primarily serves King, Pierce, and Clark counties, though both do collect from counties statewide. If factoring in the privately collected totals from Emerald and Phillip Services, King and Pierce counties would move into the below list of the top five counties collecting CESQG waste per capita.

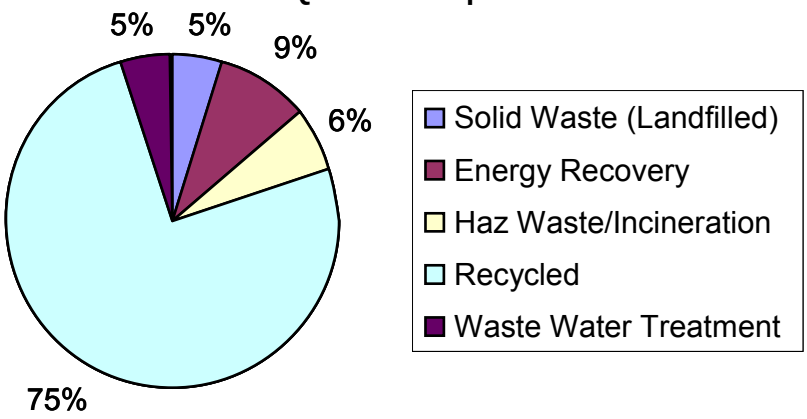
The top five counties that collected the most CESQG material per capita were:

Yakima Cowlitz Chelan Asotin Lewis

As shown in Table 6.7 (discounting the waste type "Other"), the dominant four types of CESQG waste collected in 2006 were antifreeze, flammable liquids, oil-based paint, and latex paint.

## CESQG Disposition

**Figure 6.5**
**CESQG Final Disposition**




84-percent of all CESQG moderate risk waste was either recycled or used for energy recovery. See Figure 6.5 for the complete disposition of CESQG wastes. The biggest difference between final dispositions of HHW and CESQG wastes lie in the amount of waste recycled. 74-percent of CESQG waste was recycled while 46-percent of HHW was disposed of via the same method. Also significant, is the 9-percent of CESQG waste used for energy recovery while 30-percent of HHW waste was disposed of in the same manner.

**Table 6.7**
**CESQG by Waste Type Collected in 2006 (top 25 types)**

| Waste Type | Total lbs. CESQG |
|---|---|
| Antifreeze | 4,684,859 |
| Flammable Liquids | 788,031 |
| Oil-based Paint | 262,881 |
| Latex Paint | 119,872 |
| Used Oil (non-contaminated) | 75,473 |
| Oil Filters | 57,463 |
| CRT's | 43,672 |
| Electronics | 40,907 |
| Oil with Chlorides | 39,411 |
| Latex Paint (contaminated) | 38,144 |
| Bases | 26,672 |
| Batteries (lead acid) | 26,170 |
| Acids | 24,098 |

| Waste Type | Total lbs. CESQG |
|---|---|
| Flammable Solids | 14,657 |
| Pesticide Poison Solid | 14,332 |
| Oil Filters (crushed) | 10,983 |
| Batteries (dry cell) | 10,405 |
| Batteries (small lead acid) | 9,386 |
| Chlorinated Solvents | 6,961 |
| Flammable Liquids (aerosols) | 5,184 |
| Pesticide Poison Liquid | 4,595 |
| Flammable Gas-Poison (aerosols) | 4,182 |
| Flammable Liquid-Poison | 3,843 |
| Flammable Liquid-Poison (aerosols) | 3,680 |
| Batteries (nicad/NIMH/lithium) | 3,608 |
| All Other | 806,042 |
| **TOTALS** | **7,125,511** |

# Collection/Mobile Events

Table 6.8 represents the number of mobile and collection events held statewide in 2006. The amount of waste collected through these types of events was almost 3.4 million pounds, which is approximately 10% of all MRW collected in 2006. Of the 87 events, 5 were e-waste collection only events. 30 mobile events were conducted by the Waste Mobile in King County and these events collected a little over 2.6 million pounds of MRW.

**Table 6.8**
**2006 Collection/Mobile Event Collection Amounts**

| Type of Event | Number of Events | Pounds Collected |
|---|---|---|
| **Mobile** | 67 | **2,956,141.06** |
| **Collection** | 20 | **437,384.80** |
| Totals: | **87** | 3,393,525.86 |

# Used Oil Sites

In 2006, facilities and collection sites reported collecting a total of 10,048,372 pounds of used oil (contaminated – .5% and non-contaminated – 99.5%). Used oil collection by county population is starting to show consistency with the top producers over the last few years. See Table 6.9 for the six counties with the highest collections in pounds per capita by county size for 2004, 2005, and 2006.

**Table 6.9**
**Used–Oil High Collection Counties, pounds per capita by county size collected at facilities and used oil collection sites**

| Used Oil Sites - 2004 | | |
|---|---|---|
| **County** | **Size** | **Lbs./ Capita** |
| **Mason** | 50K-100K | **13.0** |
| **Yakima** | >100K | **4.9** |
| **Skamania** | <50K | **4.7** |
| **Kittitas** | 50K-100K | **4.2** |
| **Stevens** | <50K | **4.0** |
| **Cowlitz** | 50K-100K | **3.6** |

| Used Oil Sites - 2005 | | |
|---|---|---|
| **County** | **Size** | **Lbs./ Capita** |
| **Mason** | 50K-100K | **13.83** |
| **Garfield** | <50K | **8.33** |
| **Island** | 50K-100K | **5.36** |
| **Stevens** | <50K | **5.34** |
| **Skamania** | <50K | **4.56** |
| **Yakima** | >100K | **4.16** |

| Used Oil Sites - 2006 | | |
|---|---|---|
| **County** | **Size** | **Lbs./ Capita** |
| **Mason** | 50-100K | **10.9** |
| **Stevens** | <50K | **5.5** |
| **San Juan** | <50K | **3.8** |
| **Yakima** | >100K | **3.6** |
| **Asotin** | <50K | **3.3** |
| **Cowlitz** | 50-100K | **3.3** |

# Statewide Level of Service

The Washington State Office of Financial Management reported that as of 2006 Washington State had an estimated 2,715,532 housing units[32]. MRW Annual Reports revealed there were 213,276 participants. The actual number of households served is larger due to the fact that most used oil sites do not record or report numbers of participants. The actual number of households served is also larger because some participants counted at events or by facilities bring HHW from multiple households.

One way to estimate the approximate number of households served is to add 10 percent to the participant values. This method gives an estimate of 234,603 participants served in 2006. This number represents 8.6-percent of all households in Washington State. Table 6.10 shows the percent of participants served statewide since 2001.

The slight drop seen in statewide participation from 2005 to 2006 is something to track in the future.

**Table 6.10**
**Percent of Participants Served Statewide**

| Year | Percent Participants Served | Year | Percent Participants Served |
|---|---|---|---|
| 2001 | 6.1 | 2004 | 8.9 |
| 2002 | 6.8 | 2005 | 9.0 |
| 2003 | 8.9 | 2006 | 8.6 |

# Trends in Collection

As fixed facilities continue to gain popularity, the number of collection events is decreasing. Some programs are eliminating collection events altogether or conducting waste specific events (electronics only) instead. Reasons for this shift include:

- Increased cost of collection events per amount of waste collected.
- Fixed facilities providing a sense of permanence and normality to the collection of MRW.
- Increased operation efficiencies with fixed facilities (including the option of having an efficient location to conduct a collection service for CESQG's).

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

# Product Stewardship

Some other methods of managing MRW are beginning to gain wider acceptance in Washington State and across the country.

Product stewardship efforts have resulted in the electronics recycling bill and other work is currently underway for latex paint and compact fluorescent lights. Product stewardship principles have also guided the 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, non-profit organizations, waste haulers and recyclers that offer convenient options for recycling certain products that should not be disposed of in the trash."

The Take it Back Network is a voluntary program on the part of businesses. Due to this arrangement it can be difficult to get data on the total amount of materials brought back to the businesses. Table 6.11 shows the number electronic units collected by businesses in the Take it Back Network that data was available for in 2006.

**Table 6.11**
**Units of Electronics Collected by the Take it Back Network in 2006**

| Type of Unit | Number of Units Collected |
|---|---|
| T.V.'s | 11,183 |
| Monitors | 51,930 |
| Laptops | 708 |
| Cell Phones | 1,869 |
| Peripherals | 30,885 |

# Emerging Waste Streams

MRW programs are well established statewide. Although the annual reports did not identify any new waste types, "Other Dangerous Waste" had grown to the fourth largest waste type in 2005. This indicated a need to identify what wastes were not fitting into the established categories of the report. Some jurisdictions filling out the 2006 reports indicated what they included in the "Other Dangerous Waste" category. Therefore, the 2007 reports will include some new waste types.

Used electronics continues to be an area of concern. Components in a number of electrical and electronic products contain one or more of the following substances:

mercury lead cadmium embedded batteries polychlorinated biphenyls (PCBs).

The electronics recycling bill should ease the burden of this high volume/high cost waste for local governments once it is up and operating by January of 2009. (See *Chapter II Partnering for the Environment* for more details about the electronics recycling program.

Other emerging waste streams include pharmaceuticals and personal care products.

Pharmaceutical wastes have been drawing more and more attention from state and local governments. A USGS Reconnaissance study in 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. 46 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 waste water.

In 2005, 53 million prescriptions were filled in Washington State. A 2006 King County Survey found that only 33% of people will use up all their medication. This leaves a substantial amount of pharmaceutical waste to be managed. This becomes significant from a public health standpoint. In 2004 the American Association of Poison Control Centers (62 participating members serving 294 million people) reported a total of 2.4 million exposures. 58% of those exposures were from pharmaceuticals.

In 2006, a new 2 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 was collected.

The environmental side effects of pharmaceuticals are showing that aquatic and terrestrial organisms may be affected through endocrine disruption and anti-microbial resistance (Figure 6.7).

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 as reported by the Toxic-Free Legacy Coalition:

- Consumers may use as many as 25 cosmetic products containing more than 200 different chemical compounds on any given day.
- 89% of the approximately 10,500 ingredients used in personal care products have <u>not</u> been screened for safety by the FDA or anyone else.

**Figure 6.6**
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**.

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 breastmik had slightly, but significantly, decreased testosterone levels (Main et al., 2005)

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

## Annual Reporting

Ecology requires local programs to submit MRW report forms annually. For the past few years, Ecology has requested annual reports be submitted by March for the previous calendar year collections. The information received from local programs through the MRW annual reports provides Ecology with data on MRW infrastructure, collection trends, costs, and waste types received at collection events and fixed facilities. Ecology translates this data into the information contained in this chapter and designs it to be specifically useful to those who operate or work MRW programs within Washington State.

## 2006 Uncommon Item

Every year interesting and uncommon items find their way to HHW facilities throughout the State. Figure 6.8 shows an old bottle of Phenobarbital that was brought in to the Grays Harbor Facility in 2006.

**Figure 6.7**
**Old Bottle of Phenobarbital**

# Appendix A
# Municipal Solid Waste (MSW) Generation, Recycling & Disposal

The discussion of the solid waste generation, disposal, recycling and diversion totals in Chapter V includes **all** types of waste disposed of, composted materials, source-separated materials burned for energy, and non-municipal solid waste (MSW) diverted from disposal. The following discussion is of the more "traditional" recycling, disposal and generation numbers that are made up of **only the municipal solid waste stream**.

In 1989, the Legislature amended the *Solid Waste Management Act* (chapter 70.95 RCW). The law set a state recycling goal of 50 percent, to be achieved by 1995. The 50 percent rate set by the legislature refers to the MSW recycling rate. To determine this rate, and assure that 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 municipal solid waste (MSW) by the Environmental Protection Agency.[33]

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

In 2006, there were 168 cities and county unincorporated areas offering curbside collection of recyclable materials such as glass, paper, and metals. At the same time, 125 cities and county unincorporated areas offered curbside collection of yard waste. The availability of recycling collection programs in the commercial sector (both publicly and privately operated) is also increasing, and the amount of materials these programs collect far outweighs what is collected in the residential sector.

Despite all the efforts citizens, government, and industry have made, the state did not reach the 50 percent goal by 1995. In 2002, the Legislature amended the law, giving the state until 2007 to reach the goal. The 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 (see Chapter V for a complete discussion on solid waste diversion). However, Ecology continues to measure progress on the narrower MSW recycling, since this is as an important area for municipal governments and industry assessing progress on programs that are targeted toward changing residents and businesses disposal practices.

[33] 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 landclearing debris disposed of at municipal solid waste landfills and incinerators.

MSW recycling is measured by identifying the MSW materials recycled and dividing that by the total MSW generation (recycling plus disposal). Landfills and incinerators are requested to report MSW separately, by county of origin, which makes arriving at the denominator relatively simple. Landfills are not required, however, to report the contents of the MSW. This information would have to be arrived at through a statistical sampling study, or waste composition study. Using updated waste composition data, Ecology would be able to determine individual material recycling rates. This information would be useful in local and state planning, as well as useful for industry.

## Recycling Rates for MSW

Each year since 1986, Ecology has conducted a survey to measure the statewide recycling rate for municipal solid waste. Information comes from local governments, haulers, recyclers, brokers, and other handlers of materials from the recyclable portion[34] of the waste stream.

From 1986 to 1993, the measured statewide recycling rate increased from 15 percent to 38 percent. This increase had been fairly steady, with a slight dip in 1991. In 1994, the measured recycling rate remained steady at 38 percent. In 1995, the recycling rate resumed its climb to 39 percent, and in 1996 the rate dropped to 38 percent. The 1997 recycling rate dropped again to 33 percent as a result of poor paper fiber market in Asia and a continued glut in the metals market. (See Table A.1 for MSW recycling rates for 1986-2006.)

[34] 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 landclearing debris disposed of at municipal solid waste landfills and incinerators.

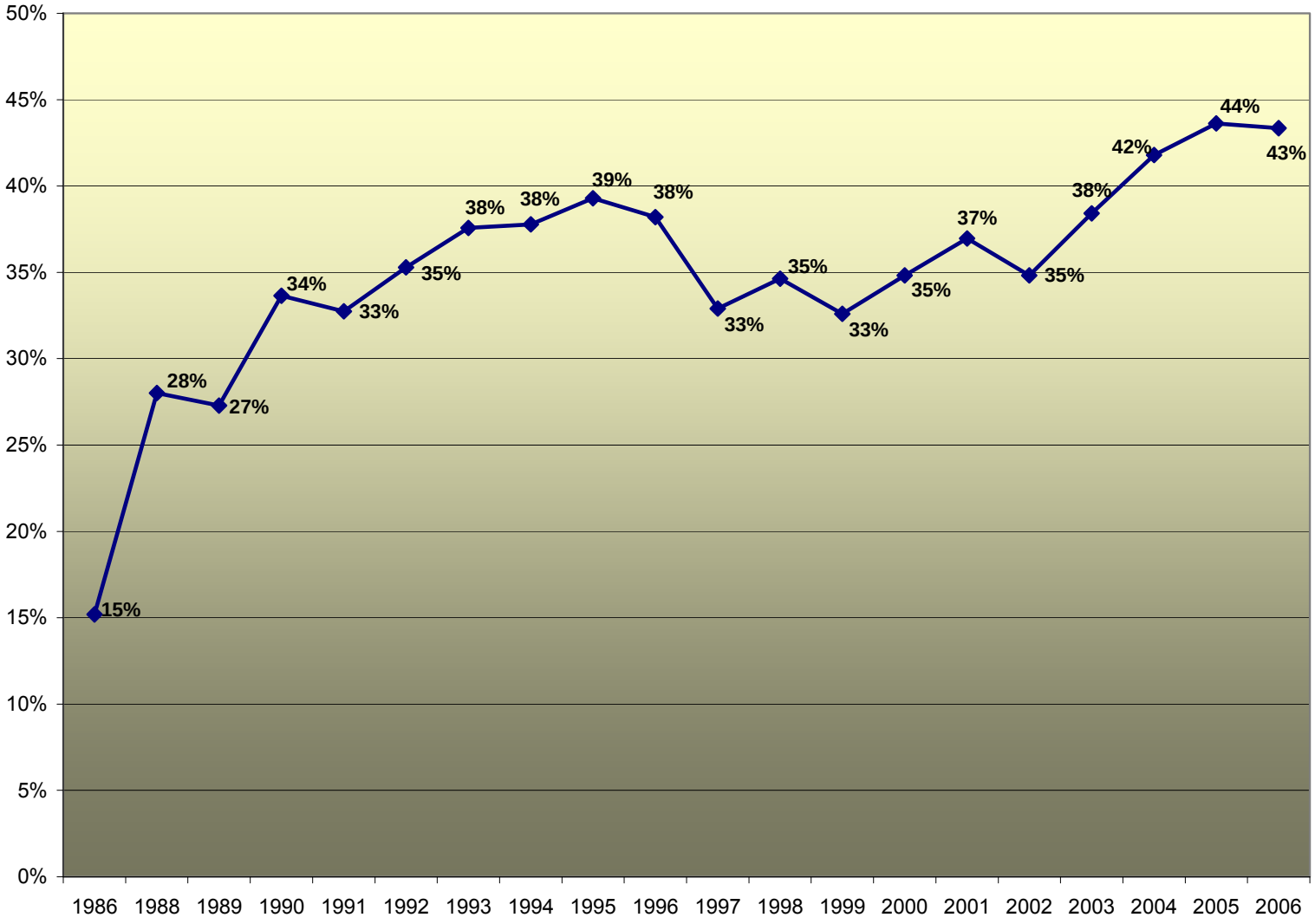
| Table A.1<br>MSW Recycling Rates<br>1986 to 2006 | |
|---|---|
| **Year** | **MSW Recycling Rate** |
| **1986** | 15% |
| **1988** | 28% |
| **1989** | 27% |
| **1990** | 34% |
| **1991** | 33% |
| **1992** | 35% |
| **1993** | 38% |
| **1994** | 38% |
| **1995** | 39% |
| **1996** | 38% |
| **1997** | 33% |
| **1998** | 35% |
| **1999** | 33% |
| **2000** | 35% |
| **2001** | 37% |
| **2002** | 35% |
| **2003** | 38% |
| **2004** | 42% |
| **2005** | 44% |
| **2006** | 43% |

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 the market conditions for papers, 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. These changes resulted in better reporting of recyclables since then. In addition, the market demand for ferrous and nonferrous metals was high during 2003, which aided in bringing 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 an historic high of 44 percent in 2005. In 2006, the recycling rate dropped slightly to 43 percent. (See Figure A.1) Detailed data on materials recovery since 1986 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

The *Beyond Waste* website also provides quantitative information on specific wastes such as organics, construction & demolition and MRW: http://www.ecy.wa.gov/beyondwaste/.

**Figure A.1**
**Washington State MSW Recycling Rate - 1986 to 2006**



In 2007, 85.8 percent of the state's population now has 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, with almost 900 thousand new people since 1995. Ecology believes that newcomers to the state may not participate as much in recycling because they missed the waste reduction and recycling outreach programs Ecology and the counties ran in the early 1990s. Studies also indicate that without ongoing education and advertising, people tend to forget the recycling message.

Many curbside programs in the state are changing to commingled or single-stream 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 went into operation. Some evidence suggests that the convenience of not having to sort recyclables leads to more residents taking part. In most cases, programs that changed to commingled collection also increased the range of materials collected; however, the act of commingling the recyclables can create a higher residual rate once the usable materials are sorted out. Compared to source-separated collection programs, the single-stream programs are collecting about 10 percent more material. The results are also mixed where end markets are concerned. Reports from mills are showing that the contamination from these programs can be great enough to reduce the usable amount of material by up to 15 percent. Ecology is making an effort to quantify these residuals and determine the quantitative impact on the recycling and diversion data through annual reports from material recovery facilities and the recycling survey.

## Measurement Methodology

See Chapter V for a complete discussion of measurement methodology as it pertains to recycling and diversion.

## Results – 2006 MSW Recycling

So we can consistently compare results from year to year, Ecology includes the same materials it has used since 1986 in the calculation of the MSW recycling rate. These materials are those originating from the MSW stream, as Ecology defined it when designing the recycling survey in the mid-1980s. Table A.2 provides tonnage figures for each material that figured into the MSW recycling rate from 2003 to 2006.

**Table A.2**
**MSW Recycled Tonnage Reported**
**MSW Recycling Rates[35] 2003-2006**

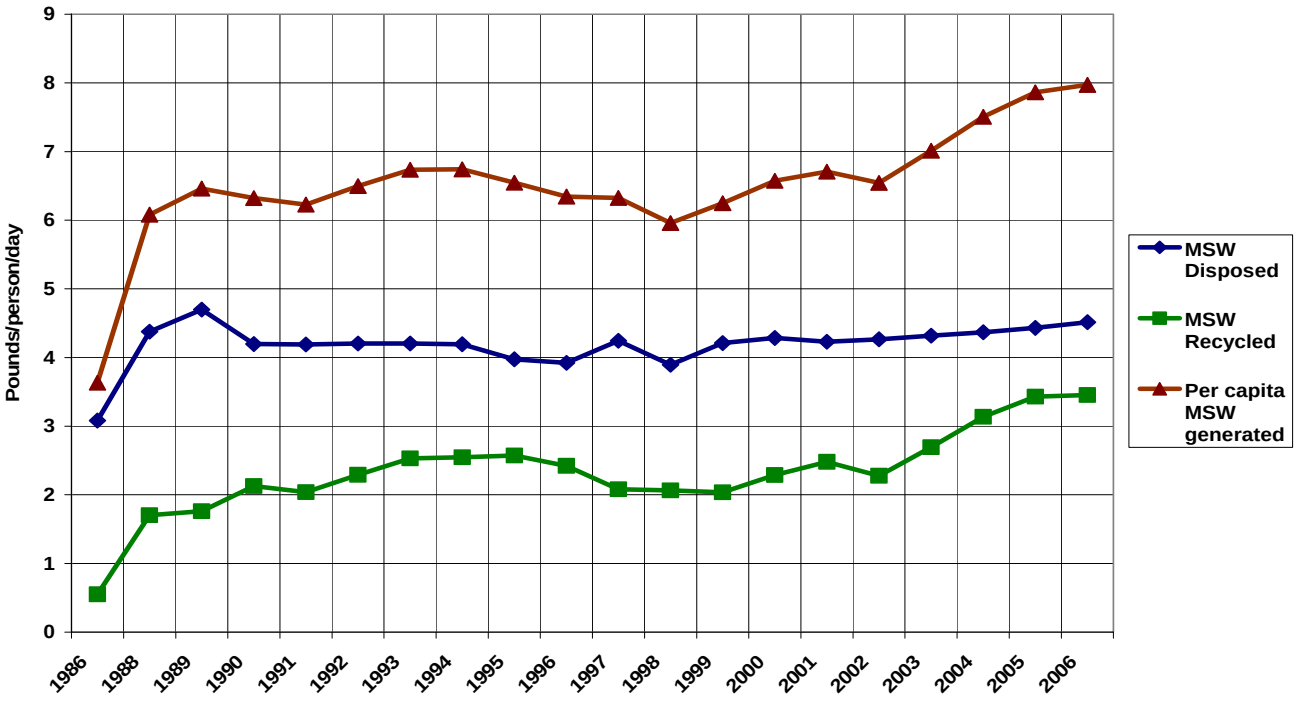
| Recycled Materials Reported (MSW) | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| Aluminum Cans | 17,608 | 16,010 | 15,441 | **14,951** |
| Computers & Parts | 3,587 | 6,568 | 8,534 | **11,386** |
| Container Glass | 74,126 | 81,405 | 82,773 | **90,992** |
| Corrugated Paper | 430,750 | 535,662 | 565,698 | **570,802** |
| Ferrous Metals | 709,881 | 866,641 | 974,535 | **1,048,885** |
| Fluorescent Light Bulbs | 772 | 732 | 729 | **1,063** |
| Food Waste | 100,755 | 126,257 | 125,390 | **171,744** |
| Gypsum | 76,946 | 35,648 | 56,618 | **62,482** |
| HDPE Plastics | 8,485 | 7,991 | 9,319 | **8,000** |
| High-Grade Paper | 59,502 | 70,210 | 58,661 | **71,774** |
| LDPE Plastics | 17,925 | 10,604 | 16,209 | **14,928** |
| Milk Cartons/Drink Boxes-Tetra | 1,789 | 8 | 4,529 | **5,755** |
| Mixed Paper | 219,111 | 230,934 | 322,732 | **316,874** |
| Newspaper | 215,882 | 261,306 | 259,157 | **294,887** |
| Nonferrous Metals | 114,604 | 99,317 | 122,490 | **135,976** |
| Other Recyclable Plastics | 3,482 | 7,783 | 7,247 | **7,776** |
| Other Rubber Materials | 5 | 12 | 0 | **39** |
| PET Plastics | 6,060 | 6,748 | 8,534 | **7,558** |
| Photographic Films | 530 | 522 | 487 | **458** |
| Textiles (Rags, Clothing, etc.) | 15,497 | 28,927 | 28,750 | **28,724** |
| Tin Cans | 9,492 | 10,082 | 12,133 | **13,936** |
| Tires | 27,753 | 37,568[36] | 53,777 | **23,528** |
| Used Oil | 56,344 | 104,211 | 111,692 | **87,304** |
| Vehicle Batteries | 18,780 | 25,518 | 28,903 | **25,414** |
| White Goods | 53,353 | 56,920 | 47,302 | **49,796** |
| Wood | 208,920 | 257,495 | 351,855 | **289,612** |
| Yard Debris | 546,487 | 646,674 | 643,376 | **665,902** |
| **Total MSW Recycled** | **2,998,428** | **3,531,753** | **3,916,872** | **4,020,548** |
| **Total MSW Disposed[37]** | **4,805,202** | **4,917,870** | **5,060,502** | **5,254,108** |
| **Total MSW Generated** | **7,803,630** | **8,449,623** | **8,977,374** | **9,274,656** |
| **MSW Recycling Rate** | **38%** | **42%** | **44%** | **43%** |

[35] Detail may not add due to rounding.
[36] Includes recycled and retreaded tires.
[37] 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 (MSW)

Each person contributes to the MSW stream through recycling and disposal of his or her household wastes. The figures below present only an average of the total contributions of all residents. Some people may actually contribute much more waste than others do. However, the picture tends to be more tangible when described in individual or "per-person" terms. Figure A.2 shows an average of how each person in the state contributes to the **MSW stream**. (See Chapter V for a discussion of the overall waste generation numbers.) In 2006, each resident of the state generated 7.97 pounds of municipal solid waste per day, an all-time high for Washington; disposing 4.52 pounds per person and recovering 3.46 pounds per person for recycling (see Table A.3).

**Figure A.2**
**Pounds MSW Disposed, Recycled, and Generated Per Person/Day**
**1986-2006**




Washington residents create, recycle, and dispose of about two pounds of MSW per person above the national averages. This larger disposal number is attributed to Washington's larger amount of yard and wood waste than the national average as well as a 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. Checks are also done with end-use information on recovered materials.

**Table A.3**
**Pounds MSW Disposed, Recycled and Generated Per Person/Day[38]**
**1995-2006**

| MSW | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Disposed** | 3.98 | 3.92 | 4.24 | 3.90 | 4.21 | 4.29 | 4.23 | 4.27 | 4.32 | 4.37 | 4.43 | **4.52** |
| **Recycled** | 2.57 | 2.42 | 2.08 | 2.06 | 2.04 | 2.29 | 2.48 | 2.28 | 2.69 | 3.14 | 3.43 | **3.46** |
| **Generated** | 6.55 | 6.35 | 6.32 | 5.96 | 6.25 | 6.58 | 6.71 | 6.55 | 7.01 | 7.51 | 7.86 | **7.97** |

[38] See waste generation chapter for per capita numbers that include diversion and all waste types.