Solid Waste In Washington State

Fourteenth Annual Status Report

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Solid Waste and Financial Assistance Program
December 2005
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Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

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Table of Contents

List of Tables

List of Figures

List of Maps

Acronyms

CESQG	Conditionally exempt small quantity generator
CDL	Construction, Demolition and Landclearing
CPG	Coordinated Prevention Grants
EPA	Environmental Protection Agency
ESSB	Engrossed Substitute Senate Bill
EYC	Ecology Youth Corps
GA	Department of General Administration
HDPE	High-density polyethylene
HHW	Household Hazardous Waste
LDPE	Low-density polyethylene
MFS	Minimum Functional Standards
MRW	Moderate Risk Waste
MSW	Municipal Solid Waste
PCS	Petroleum Contaminated Soils
PPG	Public Participation Grants
RCW	Revised Code of Washington
SQG	Small quantity generator
SSB	Substitute Senate Bill
SW&FAP	Solid Waste & Financial Assistance Program
WAC	Washington Administrative Code
WR/R	Waste Reduction/Recycling

Acknowledgments

This is the fourteenth annual status report prepared by the Solid Waste & Financial Assistance Program. I have had the lead responsibility for its preparation but could not have done it with out the help of the staff listed below. Special thanks go to the following Ecology staff for providing data and information for this annual report:

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Thanks to all who contributed.

Ellen Caywood
Environmental Planner
Solid Waste & Financial Assistance Program

Executive Summary

Summary of Findings

This annual solid waste report reflects conditions and activities in solid waste in Washington State. Chapter I discusses some emerging issues that the Solid Waste & Financial Assistance Program (SW&FAP) is dealing with in the coming year as we move forward with the implementation of the *Beyond Waste Plan*.

The remaining chapters of the annual report discuss some specific activities underway as we start implementing *Beyond Waste* and our partnering for the environment through grants to local governments and efforts on specific waste streams, the solid waste infrastructure in the state, litter collection efforts, the 2004 statewide recycling survey results, information on waste disposal and moderate risk waste. Some of the data is for 2004 (recycling/diversion, disposal and moderate risk waste information), while other data is current to late 2005 (litter pickup numbers and facility status). A brief summary of significant information is highlighted below.

Partnering for the Environment

Beyond Waste

- The *Beyond Waste Plan* sets a new vision for the future of solid and hazardous waste in the state. The 30-year vision of the plan is:

  "We can transition to a society where waste is viewed as inefficient, and where most wastes and toxics substances have been eliminated. This will contribute to economic, social and environmental vitality."

- The Major Initiatives of *Beyond Waste* include:
  - Eliminating industrial wastes from targeted sectors.
  - Establishing a viable closed-loop reuse and recycling system for capturing organic materials.
  - Encouraging a green-built environment by making sustainable building the norm in Washington.
  - Tracking overall progress toward the *Beyond Waste* vision through performance measures and improved data tracking.
  - Reducing and preventing moderate risk waste (small amounts of hazardous wastes from households and businesses).

- Some activities implementing *Beyond Waste* that were completed (see Chapter II for additional details):

- Legislative funding for implementing Beyond Waste included 4 new full-time positions and $150,000 for contracts to help conduct solid-waste work, as well as 5 positions and $1.5 million to help conduct hazardous waste work. These positions have either been hired or are in the hiring process now. The contract projects are also moving forward.

- A statewide home composting survey was conducted to define needs and opportunities for expanding home composting.

- Ecology is composting food and paper towel waste at its new demonstration facility at the Lacey building.

- A research study was conducted on possible Beyond Waste-related incentives, and a report completed. Next steps are being pursued.

- The partnership agreement between Ecology and EPA has been renegotiated to incorporate Beyond Waste priorities and certain flexibilities in regulatory approaches (mostly for hazardous waste).

- A BuiltGreen™ residential green building program partnership has been established to promote residential green building programs throughout the state and a technical assistance and informational website has been built to provide support.

- A permanent green building skills training center has been established at Community Colleges of Spokane's Apprentice Training Center.

- **Ecology's website on green building has been revised to serve as and information resource on all topics related to green building** (http://www.ecy.wa.gov/programs/swfa/greenbuilding/).

- Ecology provided over $18 million in Coordinated Prevention Grants to local governments for the 2004/05 cycle (January 2004 – December 2005). These funds leveraged local matching funds to support solid waste and moderate risk waste projects.

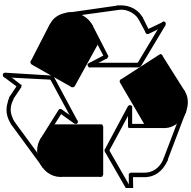
- Ecology continues efforts to help the state lead by example by assisting the Department of General Administration (GA) with efforts to green government buildings. State law passed in 2005 requires that state buildings achieve Silver Certification under the LEED standard. Ecology staff is assisting GA in various capacities including providing consultation on the implementation of the LEED requirement, helping train project managers, providing eco-charrette facilitation services, and establishing lists of pre-selected green building consultants.

- Organics continue to be a focused waste stream with some interesting research studies to expand composting opportunities including: specialty mushroom production on apple wood chips; reduction of soil lead and arsenic using compost; statewide biomass inventory; and a biomass resource to energy organic reclamation project with the construction of a pilot anaerobic digester at the WSU Dairy Center.

- Efforts with local governments and other partners is focusing on emerging problem waste streams including fluorescent tubes, electronic waste, tires, moderate risk waste and persistent bioaccumulative toxins (PBTs) such as mercury and PBDE's.

- The "Terry Husseman Sustainability in Public School Awards Program" awarded $20,000 to 19 schools that embraced the sustainability principles in two categories: Seed Award and Sustainable School Award.

Recycling and Diversion



- The 2004 recycling rate increased to 42% from 38% in 2003. The rate had remained fairly stagnant at 33-35% since 1997. This rate accounts for the "traditional recyclable materials. Better reporting of recyclables as a result of new reporting requirements for recycling facilities, as well as increased market demand of ferrous metals and paper help account for the increased recycling rate.

- In 2001, the Solid Waste & Financial Assistance Program (SW&FAP) began to include other types of materials in the recycling survey, and calculated an expanded recycling rate along with the traditional one. Termed the "diversion" rate, it includes non-MSW recyclables and non-MSW waste types as inert, construction, demolition, woodwaste and tires. This rate is calculated using the disposed amounts from the traditional municipal sources as well as inert and limited purpose landfills. For 2004, the "diversion rate" was 48%, an increase from 47% in 2003.

Litter Collection Efforts

- For July 2004 - June 2005, litter collection efforts by Ecology Youth Corps (EYC) picked up a total of 1,039,481 pounds of litter over a total of 4,604 road miles and 540 acres. This is the equivalent of 520 tons of litter.

- Other state agency programs were coordinated by SW&FAP. From July 2004 – June 2004, 941,682 pounds of litter and illegally dumped materials were collected by Departments of Corrections and Natural Resources.

- The Community Litter Cleanup Program (CLCP) provides funds to local governments through contracts for local litter collection programs. Now in its fifth cycle (July 2004 – June 2005) local governments are again partnering with volunteer groups and are working with state and local offender crews. For the fifth cycle (July 2003- June 2005), 54,777 road miles and 9,485 illegal dump sites were cleaned. A total of 8,582,254 pounds of litter and illegally dumped materials were collected, of which 775,953 pounds were recycled.

- Anti-litter education combined with effective litter-pickup efforts have led to nearly a one-quarter decline in litter along Washington's roadways, according to Ecology's litter survey report. A litter survey in 2004 found a decline from 8,322 tons to 6,315 tons, or 24 percent, compared to a similar survey conducted in 1999.

Disposal of Solid Waste

- In 2004, 17 municipal solid waste landfills accepted 5,506,112 tons of waste.

- The total amount of waste disposed in all categories of Washington state landfills and incinerators increased from 5,973,325 tons in 2003 to 7,418,978 tons in 2004. Several categories of waste increased in 2004 and over 900,000 tons was attributed to dredged sediments from Puget Sound cleanup activities.

- Currently 14 of Washington's 39 counties have an operating municipal solid waste landfill. Most counties without their own municipal solid waste landfills have long-haul contracts to either Roosevelt Regional Landfill in Klickitat County or one of three landfills in Oregon.

- Three incinerators burned 327,837 tons of waste in 2004, accounting for less than 6% of the waste disposed in state. Of the three operating incinerators, only one burns municipal solid waste (there is another MSW incinerator that is currently permitted but inactive). The other two incinerators are for woodwaste.

- The amount of waste imported for disposal increased in 2004 to 202,787 from 122,884 tons in 2003 Exported waste increased in 2004 to 1,817,665 from 1,515,532 in 2003, with almost twelve nine as much waste exported as imported. The imported waste accounts for a little more than 3% of the solid waste disposed and incinerated in Washington.

- The 16 operating municipal solid waste landfills reported in April 2005, a statewide permitted landfill capacity of 219 million tons, or approximately 40 years at the current rate of disposal. The majority of that permitted capacity (90%) is at private landfills, with Roosevelt Regional Landfill in Klickitat County accounting for 79% of the statewide capacity.

Moderate Risk Waste

- In Washington State there are 42 programs that manage moderate risk waste. All 39 counties have some kind of an MRW program. There were 49 fixed moderate risk waste facilities statewide in 2004.

- In 2004, Washington collected over 22 million pounds of household hazardous waste (HHW), almost 12.4 million pounds of used oil (UO), and over 2.4 million pounds of conditionally exempt small quantity generator (CESQG) waste, for a total of nearly 37 million pounds.

- Many of the MRW collection programs statewide are exploring management of various other components of municipal solid waste, especially mercury-containing lamps and electronic wastes.

Chapter 1 Issues Facing Solid Waste

Waste Prevention

An ounce of prevention is worth a pound of cure.

This proverb has stood for ages. Yet we have not followed this advice in the solid waste world. Working together with our many partners, we have developed a tremendously safe system to take care of Washington's garbage. Our unwanted stuff gets whisked away from our curbs and deposited in a landfill that we'll never see, often across the state or even in another state.

"Not in my backyard" has been tremendously successful. But at what cost? It is easy to fill our garbage cans with stuff we no longer want. Citizens today toss more garbage out than ever before.

It's true that we are also recycling more waste than ever before, which beats throwing it into a landfill. But again, we are generating and disposing of more waste than ever before. So how do we change?

Prevention. A simple concept, and so hard to enact. Try as we might, the single best indicator for our waste generation rate is the economy. Simply put, the more money we have, the more stuff we buy. The more stuff we buy, the more waste we make. Forget your latest new electronic gadget – of course you'll never throw it away (ahem). But what was involved in the mining of metals to drive those circuits? How did the ore get to market? What chemicals and energy inputs were needed to turn the ore into pure metals? What powered the ships, trains, and trucks that got those raw materials to the final destination, and then into your house?

How can we begin to understand that the waste is not just the materials we throw away at home? The act of throwing something away may be wasteful in itself, but it represents a waste of many more resources that we don't even think about.

Waste is waste. This statement is not meant to be trite. But consider for a moment the word "waste". Do you want more waste or less? Do we want our natural resources to be depleted, our air, land and water polluted? What about our future generations? What legacy are we leaving them?

Ecology recently completed a revised State Solid and Hazardous Waste Plan, the *Beyond Waste Plan.* The *Beyond Waste Plan* sets a new vision for the future of solid and hazardous waste in the state. The 30-year vision of the plan is:

> ***"We can transition to a society where waste is viewed as inefficient, and where most wastes and toxics substances have been eliminated. This will contribute to economic, social and environmental vitality."***

The initiatives in the *Beyond Waste Plan* focus on reducing wastes and toxic substances in Washington. Successful implementation of the initiatives will:

- Significantly reduce most wastes and the use of toxic substance in Washington's industries.
- Significantly reduce small-volume hazardous waste from businesses and households.
- Expand the recycling system in Washington for organic wastes such as food wastes, yard waste, and crop residues.
- Reduce the negative impacts from the design, construction and operation of buildings.
- Develop a system to measure progress in achieving our goals.

So now do we move forward to think of waste materials as inefficient and as a resource? How do we think differently about the generation of waste? One way is to think about the life-cycle of a product. What resource and energy went into the manufacturing of it? What did it take to get the product to the store, my home? What came with the product that I immediately discarded, like the packaging it came in? Whose responsibility is it for the product after I am finished with it? Should I just toss it away, or could some of the materials in that product be reused? If it is toxic, should I be concerned about how and where it goes when I am through with it?

For some of us, if we produce less garbage and need a smaller garbage can, we can pay less to have it picked up and hauled away. It costs money to pick up the waste at the curbside, haul it to a transfer station, a rail line or a landfill. Landfills cost money to operate, to close at the end of their life, to monitor after they have closed, and all too often in the past, cost money to cleanup when they contaminate ground water. What if there was less waste produced, so less picked up, transported and disposed? There will always be some materials that we can do nothing with but dispose in a landfill. But if that amount of waste is less, the landfill would last longer, there would be less spent on transporting the waste. Instead of spending money on transporting and disposing of a material we call waste, which means it has no value to us, we could use funds for other things – schools or health care for instance.

Ecology has been successful at developing a prevention campaign against litter. We found that to reduce litter, we had to reach the people who littered and encourage a change in their mindset. The same will be true for all of us who have had the luxury of having our waste picked and whisked away, out-of-sight, out-of-mind.

Everyone, citizens, state and local governments, the environmental community, businesses and manufactures needs to be part of the shift in thinking up-stream, from where waste is produced to the point of manufacturing and even before.

The Washington State Legislature just passed an Electronic Recycling Bill (ESSB 6428) that requires electronic product manufacturers to provide free electronic product recycling services within each county throughout the state at no charge to the product owner, no state tax or fee

charged to the consumer. Covered products include computers, computer monitors, laptop computers and televisions. The services are to be provided to any household, charity, school district, small business, or small government located in Washington State. This bill was successful through the hard work and cooperative efforts of the manufactures, the environmental community and Ecology. This is a significant step in helping to solve the problem of disposing of electronics.

Working in partnership with citizens, state and local governments, the environmental community, businesses and manufactures, we can move forward to reduce and prevent waste. Chapter 2 *Partnering for the Environment* discusses several activities that are underway in the state. Together we can make a difference.

Chapter II
Partnering for the Environment

Ecology's Solid Waste and Financial Assistance Program (SW&FAP) continues to emphasize collaborative partnerships in all aspects of waste management and waste reduction work. Partners in business, local government, community organizations, state government, agriculture, academia and industry are bringing together their diverse expertise, creative ideas and resources to tackle challenging issues and also to work toward important goals, including a more sustainable future for us all.

The past year has been an exciting time of transition in solid waste, as we have begun implementing priority actions in the *Beyond Waste Plan*, which is the state solid and hazardous waste plan completed in November 2004. Moving *beyond waste* involves a fundamental shift from managing wastes at the end of the pipe to preventing them from being generated in the first place wherever possible. Recognizing that many wastes will continue to be generated, the beyond waste plan also calls for valuing these materials as resources, and moving them into closed-loop recycling systems instead of disposing them.

The *Beyond Waste Plan* is both visionary and practical. It lays out an aggressive set of actions that need to be taken in the short-term to make progress toward the long-term vision for our state. It is comprised of 7 categories of actions, containing a total of 64 recommendations. Of these, 41 recommendations were identified as priority starting point projects, to begin as soon as possible, with our partners. More information about *Beyond Waste* is available at www.ecy.wa.gov/beyondwaste/ .

Many people and organizations have come together to launch several of the *Beyond Waste* implementation activities that have begun. Additional implementation projects are also being planned and will be underway during the next year.

Implementing the Beyond Waste Vision

Highlights of implementation activities are listed below along with a summary of the status of *Beyond Waste* implementation. Other interesting "partnering projects" are also discussed in this chapter.

What's been completed:

- Legislative funding for implementing *Beyond Waste* included 4 new full-time positions and $150,000 for contracts to help conduct solid-waste work, as well as 5 positions and $1.5 million to help conduct hazardous waste work. These positions have either been hired or are in the hiring process now. The contract projects are also moving forward.
- A statewide home composting survey was conducted to define needs and opportunities for expanding home composting.

- Ecology is composting food and paper towel waste at its new demonstration facility at the Lacey building.
- A research study was conducted on possible *Beyond Waste*-related incentives, and a report completed. Next steps are being pursued.
- The partnership agreement between Ecology and EPA has been renegotiated to incorporate Beyond Waste priorities and certain flexibilities in regulatory approaches (mostly for hazardous waste).
- A meeting of moderate risk waste (MRW) stakeholders was held in January 2006 to work on the next steps in implementing the MRW recommendations.
- A BuiltGreen™ residential green building program partnership has been established to promote residential green building programs throughout the state and a technical assistance and informational website has been built to provide support.
- A permanent green building skills training center has been established at Community Colleges of Spokane's Apprentice Training Center.
- Ecology's website on green building has been revised to serve as an information resource on all topics related to green building (http://www.ecy.wa.gov/programs/swfa/cdl/).

What's Underway:

- Mercury reduction MOUs are being signed with both the Auto Recyclers of Washington (AROW) and the Washington State Hospital Association.
- A state Chemical Action Plan on PBDEs (brominated flame retardants) is being developed.
- Ten electronics manufacturers are participating in a process to explore Third-Party organization (TPO) roles for helping with needs to collect and recycle electronic products in the Northwest.
- A subcommittee of the State Solid Waste Advisory Committee (SWAC) for the electronic product recycling and reuse project has been developing recommendations for a model electronics product stewardship infrastructure. A report was delivered to the legislature December 2005.
- A statewide green building summit is being planned for 2006.
- Ecology is providing assistance to state government in green building projects.
- Additional assistance is being offered to local jurisdictions revising/updating their local solid and hazardous waste plans.
- Office/institutional food waste composting manual is being written and Ecology's compost facility is helping to promote composting at other agencies and institutions.
- Performance indicators that help track progress toward the *Beyond Waste* milestones and vision are being researched and developed.

- A statewide home composting workshop and information exchange/peer network is being planned for 2006.
- Ecology is leading three projects of the National Paint Dialogue to create a paint take-back system.
- Work is beginning on a process to identify closed and abandoned landfills and municipal dumps.
- The *Beyond Waste* Website is being redesigned to serve as an implementation resource.
- Incentives for organics recycling, green building and hazardous waste and toxics reduction are being researched.
- The Pollution Prevention Planning program is being revised, and research is being conducted on how the program can become more effective.
- A low-interest loan or other financing program for hazardous waste-generating facilities is being researched.

Note that the *Beyond Waste* is a combined solid waste and hazardous waste statewide plan, and that many hazardous waste actions are also underway to implement the plan. These are not included here, with the exception of those actions related to the Moderate Risk Waste (MRW) Initiative. Information about *Beyond Waste* activities related to hazardous waste may be accessed from our website at (http://www.ecy.wa.gov/beyondwaste/).

Partnering for the Environment through Sustainable "Green" Building

In 2005, the Solid Waste and Financial Assistance Program (SW&FAP) began implementation of one of the *Beyond Waste* priority initiatives - mainstreaming green building in Washington State. To meet the implementation needs of the initiative, SW&FAP has increased green building staffing levels and now includes staff at Headquarters (HQ) and all four regions. Expanding the expertise of these new staff people, introducing them to the regions green building constituents and creating the foundation for an efficient and effective green building team has been a major focus this year.

Green Building Partnerships

The ambitious *Beyond Waste* Green Building Initiative relies heavily on existing and new partnerships and plans are underway to step-up efforts to engage these partners regarding the need for collaboration. SW&FAP staff are working with the Cascadia Green Building Council and others to plan a summit of green building organizations to move this region forward as a national leader in green building. At the summit, we will:

- identify priority needs for the region,
- conduct a gap analysis - a list of what is needed (across the state) and what is available to meet the needs
- identify ways to work together to leverage resources and provide an effective, united approach

Meanwhile, SW&FAP staff continue to partner with and provide support to organizations that are providing leadership on green building in Washington. Ecology's involvement in earlier efforts to organize green building programs in the region resulted in the formation of the Cascadia Chapter of the US Green Building Council. This organization, which encompasses Oregon, Washington and British Columbia, is the leading regional chapter of the Council. To expand on the successes of this organization and bring services to a more local level, branches have been established in Seattle, Portland, Vancouver BC, Spokane, Olympia and Tacoma. Ecology has provided significant support to help establish and staff these local branches.

Ecology regional staff led the transition of the Spokane-based Resource Efficient Building and Remodeling Council (REBAR) and worked with local members to found the Inland Branch (Headquarters in Spokane) of the Cascadia Chapter. SW&FAP staff, as volunteer branch director of the Inland Branch led an effort to expand Council membership for local architects and developers and the result has been the development of an aggressive green building agenda for Eastern Washington.

Ecology staff are supporting the newly formed Tacoma/Olympia Branch of Cascadia by serving on its steering committee, helping to organize and staff the LEED Users Group which brings together building professionals to share wisdom on implementing the US Green Building Council's LEED (Leadership in Energy and Environmental Design) standard in building construction.

SW&FAP staff also serve on both local and regional boards of the Northwest EcoBuilding Guild. Staff head the programming committees at local and state levels to develop educational opportunities for the Guild and the broader communities. For example, staff found sponsorship to pay for Atlanta based sustainable community developed Greg Ramsey to conduct a three-day workshop for the Inland Chapter. Following the workshop Greg Ramsey was hired by the city of Post Falls, Idaho to help plan for anticipated growth in the next decade.

Lead by Example in State Government

Ecology continues efforts to help the state lead by example by assisting the Department of General Administration (GA) with efforts to green government buildings. State law passed in 2005 requires that state buildings achieve Silver Certification under the LEED standard. Ecology staff is assisting GA in various capacities including providing consultation on the implementation of the LEED requirement, helping train project managers, providing eco-charrette facilitation services, and establishing lists of pre-selected green building consultants.

Eastern Regional Office (ERO) staff persuaded the administrations at School District 81and West Valley High Schools in Spokane to assess the feasibility of going green with their projects. As a result, both school systems committed to building “green” schools using a new green building standard modeled after the LEED standard, which is now required for large, state-funded construction projects. ERO staff subsequently facilitated a design charrette with capital planners and the design/engineering teams for the District 81 construction projects and provided consultation on green design features to incorporate in building specification and criteria for selecting qualified design professionals.

Residential Green Building

Expanding residential green building throughout Washington is one of the priority actions in the *Beyond Waste* Green Building Initiative and great strides have been achieved here.

Ecology staff partnered with the Master Builders of King and Snohomish Counties and other established Built Green Programs in the state to develop the new Built Green Washington Website launched in the summer 2005 (http://www.Builtgreenwashington.org). It unites the residential Built Green™ programs across the state, so prospective home owners and builders can get information easily on how to save money and natural resources by building green. Site users can view the latest news, current events, resources and case studies across the state regarding high-performance homes.

In addition to the new website, the established Built Green programs are moving toward forming a cooperative called Built Green Washington. Using some seed money provided by Ecology's Solid Waste & Financial Assistance Program, a draft start-up plan was prepared through the Built Green Program of King and Snohomish Counties, by O'Brien & Company, Inc., and reviewed by the Built Green Washington group. The Built Green Washington cooperative is envisioned as directly educating the public and builders on the benefits of green homes, and connecting them to local and statewide resources; as coordinating and leveraging the efforts of existing local programs; and as encouraging the development of local programs, education and training, or other green home building initiatives where they do not exist. The draft Plan has been distributed to the larger Built Green membership and funding is being sought.

Ecology staff has been providing consultation to emerging local Built Green programs as well; and have participated in the development of the Olympia Master Builders Built Green program, sitting on the steering committee and its education subcommittee. They have also provided assistance in the planning and staffing for public tours of Built Green homes and led an effort to obtain a $40,000 grant to provide education and training to area builders. Staff has also provided assistance to the newly formed Jefferson County program and to Clallam County which is in the very early stages of program development. A PowerPoint presentation was developed by Ecology staff to help educate community leaders about the benefits a Built Green program can bring to an area and is available for use around the state.

Thurston, Whatcom and Jefferson counties join Pierce, King, Snohomish, Clark and Kitsap counties in offering local builders and home owners the Built Green Program. Clallam county and others are gearing up to follow.

Increase Knowledge and Access to Green Building Information

Across the state, Ecology's regional staff efforts led to a relative explosion of interest and action for green building design and construction.

Ecology regional staff played a pivotal role in bringing together a highly successful partnership of building trades apprentice trainers, community college educators and school district facilities planners that has resulted in a new approach to green building training not duplicated anywhere in the Pacific Northwest or perhaps the nation.

Working with Community Colleges of Spokane, the Inland Northwest Apprenticeship Training Council, Garco Construction and School District 81, Eastern Regional staff negotiated a partnership that was awarded the second largest Job Skills Training Program grant ($480,000) ever awarded by the Washington State Board of Community and Technical Colleges. This grant funded the development of a permanent green building training center at Community Colleges of Spokane's Apprentice Training Center and resulted in School District 81 signing an agreement to target a 15% apprentice utilization rate on new construction estimated at almost $200 million over the next several years.

More than 700 design professionals, building owners and officials and building trades apprentices attended hundreds of hours of training developed with regional staff help and often facilitated or presented by regional staff during 2005.

SW&FAP staff also worked towards bringing new training opportunities to the Eastern region including the *Green Building and LEED* workshop which was offered in both Spokane and the Tri-cities and *Dollars and Sense: Funding and Planning Green K-12 Schools in WA.*

Eastern regional staff also facilitated or provided resources to assist facilitation for a number of charrettes for local building projects. These projects included the 5th and Washington Block Project of Spokane Housing Ventures and the Center for Water Studies in Walla Walla.

Central regional staff along with assistance from staff in the Eastern Region partnered with Columbia Basin Community College to bring Green Building Training to the Tri-Cities area. During May and June of 2005, four classes were offered to members of the community:

- *Why Green Building?*
- *How to Write, Interpret and Bid Green Specifications*
- *Green Building Standards, and Strategies*; and
- *Deconstruction*

Class size ranged from ten to twenty people and participants were made up of local architects, contractors, laborers, school administrators, and students of the apprentice utilization program at Columbia Basin Community College.

Finally, a complete overhaul of Ecology's Green Building website was completed this year. The site leads users to the best green building resources available in the state for both commercial and residential construction ((http://www.ecy.wa.gov/programs/swfa/cdl/).

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

In 2005, the Solid Waste and Financial Assistance Program (SW&FAP) began implementation of one of the priority *Beyond Waste* initiatives - to expand and strengthen the closed-loop reuse and recycling system in Washington for organic materials. To meet the implementation needs of the initiative, SW&FAP has increased organics specialist staffing levels at its HQ office, to provide statewide technical and program assistance.

Home Composting

In May 2005, residential composting coordinators from counties around Washington State filled out a Home Composting Survey.[1] The responses to this survey have helped to plan efforts toward improving and implementing residential organics recovery programs. The survey results showed that, of 33 counties reporting, 29 counties conduct some level of home composting program.

The survey results also pointed to some important opportunities and needs that can be met to move toward the five-year *Beyond Waste* milestone to achieve active and successful home composting programs in every county. They include:

- Develop a state-wide "master" composter curriculum
- Provide a centralized educational resource for counties
- Promote peer to peer networking opportunities
- Provide technical assistance to program coordinators

[1] Home Composting Survey Report, prepared for the Washington State Department of Ecology by Ridolf Inc., July 19, 2005, Publication No. 05-07-044.

July 2005
Home Composting Survey Responses

A grant from USEPA Region 10 has been awarded to Ecology to help meet some of these needs. The grant will help Ecology fund a one-day, Washington State Home Composting Workshop (Workshop) for home composting program coordinators from all Washington counties. This workshop will create a peer-to-peer opportunity for home composting programs to model their successful strategies and share outreach materials (brochures, signs, displays and presentation materials). The Workshop will lay the foundation for building a comprehensive network to link successful and inexperienced programs statewide.

Some money from the grant will help pay for the development of a CD, containing "canned" presentations on home composting, brochures and outreach materials. Additionally, a team of

coordinators will be convened to create a "master" composter curriculum which will be distributed for use by program coordinators to train additional staff and volunteers.

Workshop attendees will leave with the tools, contacts and inspiration to improve old programs or create new programs that will promote residential food waste and yard debris home composting statewide which can be sustained with the staff (local government, private or non-profit) available in the existing community.

Commercial Composting

Composting continues to be a key element of the state's goal of creating a closed-loop system for recycling organic materials. Success in reaching the goal depends primarily on the success of the composting facilities which process those materials. (See http://www.ecy.wa.gov/programs/swfa/solidwastedata/ for the facilities reporting composting activities in calendar year 2004.) Thirty-one compost facilities reported actively recycling organic material in Washington in 2004. Collectively they transformed over a million cubic yards of organic waste, which included (in order of quantity recycled) yard debris, miscellaneous material including food waste, wood waste and sawdust, manure, and biosolids. From this organic waste material approximately 1,002,659 cubic yards of finished compost were produced and sold.

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, as well as testing criteria which 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." SW&FAP has worked collaboratively with Washington State University Cooperative Extension researchers, consultants, and local governments to educate potential composters about the new opportunities and the responsibility to use best practices when composting even small volumes of material.

In other collaborative work, SW&FAP continues to support composting and compost use though activities such as training compost facility operators and promoting compost use for erosion control and stormwater management.

Research Projects with Organic Materials

Specialty mushroom production on apple wood chips

An exciting research project was conducted in 2005 in an effort to expand composting opportunities. The intent of this investigation was to provide the foundation to establish a specialty mushroom industry in North Central Washington, create value in an orchard waste product, and create a resource cycle by composting the mycelium and wood chips after production decrease in order to create a resource cycle.

Specialty mushrooms include the widely available shiitake (*Lentinula edodes*), and oyster (*Pleurotus ostreatus*), along with several lesser-known varieties. In the Northeast U.S., which produces the vast majority of the specialty mushrooms, shiitakes are grown on oak sawdust, a waste product from lumber mills. Here in the Northwest, wood chips from apple trees may provide a suitable substrate (growing medium) for production of specialty mushrooms, but their suitability had not yet been tested.

Peter Severtson (Ecology), Dr. Kent Mullinix (Director, Institute for Rural Innovation and Stewardship (IRIS)), Dr. Leo Garcia (Assistant Professor, IRIS) and Pamela Coleman (Ph.D) worked together to manage this project.

The results from mushroom production were encouraging. All four supplement rates provided commercially acceptable yields of 2 pounds per log. Shitake mushrooms were the most productive and given the market value of the mushrooms, appear to be a viable enterprise. It was demonstrated that utilization of a waste product from orchards in Eastern Washington could be utilized to provide alternative income for farmers and prevent burning of this material.

To create a closed resource cycle, this project incorporates the composting of the residual mushroom substrate material. A composting facility has been built at the Wenatchee Valley College orchard where the mushroom substrate and other organic materials are going to be composted, and then used on the orchard in an effort to establish a sustainable tree fruit program.

A research agenda is currently being developed to investigate the beneficial effects of compost and compost tea on fruit production. The goal is to develop effective and sustainable farming practices through research that utilizes organic materials. As farmers adopt these practices to solve problems regarding soil degradation and offset the increasing cost of nitrogenous fertilizers, a market-based incentive can drive organics consumption and limit solid waste production in Washington.

Lead and Arsenic in Soil

EPA funded research on reduction of soil lead and arsenic using compost. Peter Severtson, Department of Ecology, and Dr. Sally Brown, University of Washington jointly managed this project.

Lead and arsenic soil contamination is widespread through north central Washington due to the extensive use of lead-arsenate pesticide on tree fruit. A significant amount of effort has been put

forth to evaluate the severity of the soil contamination problem and find realistic solutions to it. The Lead Arsenic Task force was established to address the issue.

Compost created with an iron additive is being used to investigate the ability of applied organics to limit bioavailability of lead and arsenic. Applications of specially produced compost have been applied to soils at Wenatchee Tree Research using an extraction method, Physiologically Based Extraction Test (PBET), to assess the bioavailability of lead and arsenic subsequent to compost application.

If this method is shown to be effective at reducing bioavailability of these metals, two things may be achieved:

1) Developing a cost effective method of remediating contaminated soils without soil removal or capping, and,
2) Create "demand pull" for organics by establishing an effective use for compost in local markets.

This would utilize a market approach to address solid waste issues in Washington by helping to reduce current practices of burning and disposal of organic materials.

Statewide Biomass Inventory

Ecology established an Interagency Agreement with the Washington State University (WSU), Department of Biological Systems Engineering in November 2004, to complete a Statewide Biomass Inventory. Meetings were held with interested local governments. The City of Tacoma Solid Waste and Wastewater Divisions through the Northwest Biosolids Management Association, and Kitsap County Solid Waste Department provided additional funding to complete this project.

The goal of the study was to inventory Washington's bioresources as a first essential step for all related planning and implementation efforts to implement the state *Beyond Waste* strategy for reduction of organic residuals in solid waste. This inventory also represents a first step toward a sustainable energy policy and vision within the state since information on type and geographic distribution of biomass was perceived as critical for feasibility analysis and project prioritization.

Work has been completed by Craig Frear and the WSU Biological Systems team on the database of biomass sources, the visual basic maps of the county by county biomass and energy data. The final Statewide Biomass Inventory report is available at http://www.ecy.wa.gov/biblio/0507047.html. The final biomass and bioenergy inventory for Washington State provides a review of data sources and available reports and references. The WSU Energy Extension office has agreed to provide web hosting and access to the report, database and maps at http://www.pacificbiomass.org.

This project geographically identified, categorized, and mapped 45 potential sources of biomass in Washington at a county level. The categories included field residues, animal manures, forestry residues, food packing/processing waste, and municipal wastes. The biomass inventory was then converted to potential energy production using anaerobic digestion and simple combustion as representative conversion technologies. A five-step method was used for

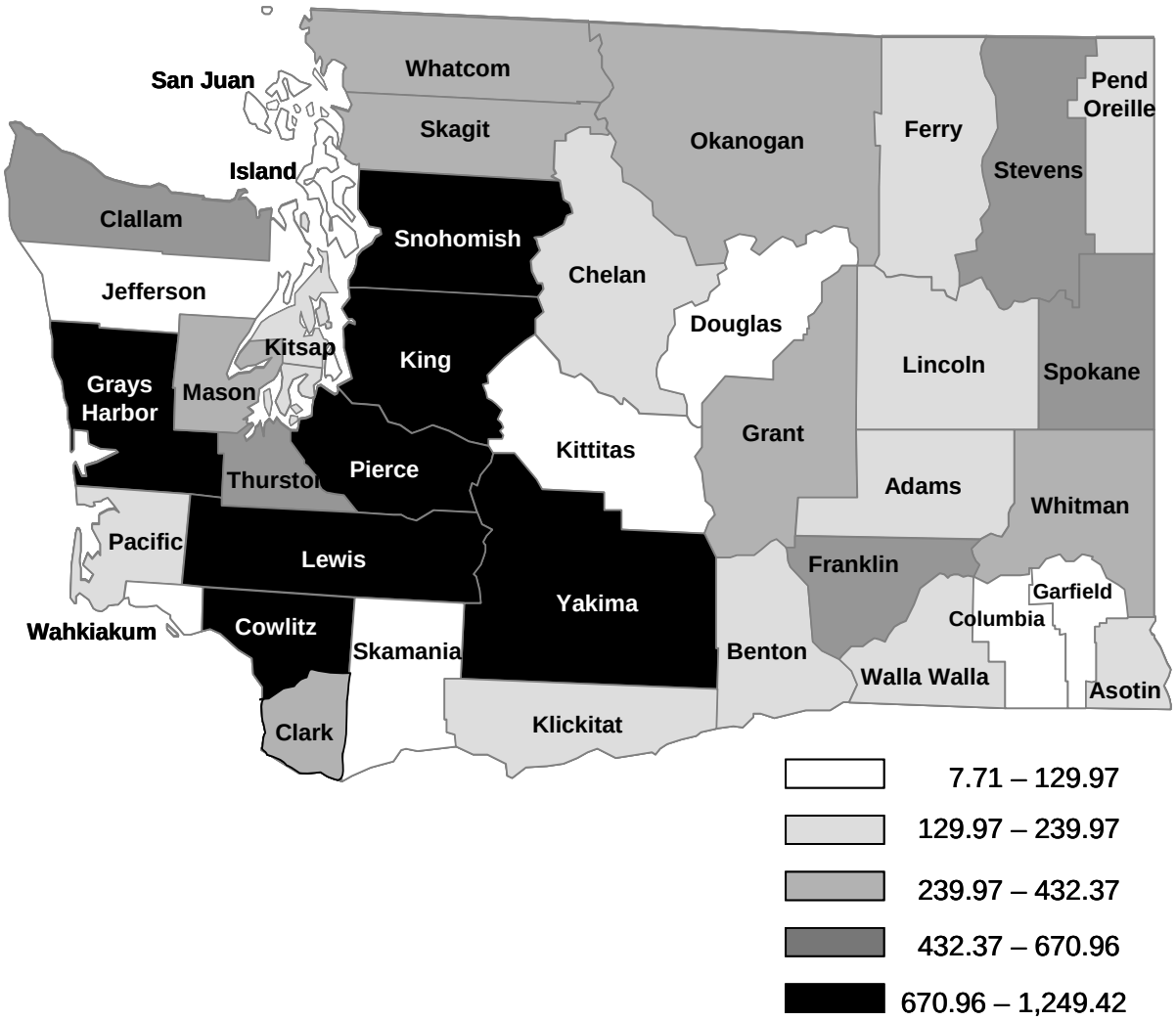
inventorying and determining the biomass and potential electrical energy from Washington's biomass.

- First, agriculture, processing and municipal statistics and databases along with personal interviews with agriculture and solid waste processing leaders led to the development of a biomass inventory.
- Second, the resulting biomass was standardized to represent total dry matter.
- Third, woody or straw-like materials with a high lignocellulosic content were evaluated for potential energy production using combustion as a conversion technology. Heat value coefficients were determined for each individual woody or straw-like material and used to calculate the potential electrical energy and power using 20% conversion efficiency.
- Fourth, the wet biomass, represented largely by the animal manures and processing wastes, was evaluated for potential electrical energy production using anaerobic digestion as its representative conversion technology. In this process, the dry biomass was converted to available volatile solids and ultimately potential methane production using laboratory determined coefficients for each of the biomass types. From the methane production levels, estimates of electrical energy and power production were developed using 30% conversion efficiency.
- Lastly, the biomass and bioenergy databases at state and county levels across the varying categories were mapped on GIS and made web-accessible through a visual basic directory.

The results of this study show that Washington State has an annual production of over 16.9 million tons of underutilized dry equivalent biomass, which is capable of producing, via assumed combustion and anaerobic digestion, over 15.5 billion kWh of electrical energy or 1,769 MW of electrical power. This power total, assuming complete utilization of the inventoried biomass, is equivalent to just about 50% of Washington State's annual residential electrical consumption (EIA, 2003).

Figure 2.1 shows that Washington has a vast and diverse, annually renewable biomass that is predominantly dispersed lignocellulosic waste (forestry, field straws and yard waste). These materials present technical and economic challenges in collection and processing. However, about 15 percent of the available biomass is in the form of more readily biodegradable and concentrated waste streams coming from the municipal solid, animal manure and food processing wastes. Mapping of the biomass showed regional areas of concentration with the highest concentrated areas being regions where forestry and municipal or forestry and agriculture intersect, such as the Puget Sound/Cascade and Yakima regions.

Figure 2.1 Bioenergy by County and Region (Bioenergy in million kWh)



The abundance, diversity and distribution of these organic resources should begin to catalyze thinking about the development of renewable fuels and energy strategies within our state. Coincidentally, the distributed nature of the resource aligns geographically with areas of the state where development of new business opportunities and jobs is of vital interest. Distributed production also possesses substantial other benefits such as decreased dependence on outside supply, price elasticity, market independence and local control all which make development of these resources a vital interest of the state.

Biomass Resource to Energy - Organic Reclamation Project

In the spring of 2004, the Department of Ecology's Solid Waste and Financial Assistance Program set aside a limited amount of funding ($100,000) for a one time only contract to support the development of new and creative approaches to organic waste reclamation and energy recovery. With this funding SW&FAP wanted to encourage development of the waste biomass

to energy industry through actual production facility build out and evaluation. Proposals were accepted from any of the following eligible entities:

- public authorities including state and local public agencies and entities
- taxing districts
- port districts
- conservation districts
- universities
- federally recognized tribes

Proposals had to demonstrate energy recovery and viable processing system by-products with the following goals:

- production facility that takes an innovative approach to waste minimization.
- creates an energy recovery process from the organic waste.
- recycles organic materials for distributed energy production and soil revitalization.
- achieve a design goal of zero waste.

We hoped to encourage many varying organic energy recovery technologies that are actively being pursued by public agencies, local governments, and developers across the state. We believed that the successful construction and operation of a biomass project could be enhanced through collaboration and partnership with regulators and external stakeholders. To encourage collaboration while ensuring a fair and open process to solicit projects from eligible entities, a competitive contract proposal process was established for project proponents.

The RFP announcement was open for a period of four weeks during late May and June, 2004. Ecology received fifteen inquiries from many areas across and outside of the state indicating:

1. great interest and support for renewable energy recovery projects,
2. desire to improve current waste management strategies, and
3. need for a source of funds so that proposals could be implemented.

Proposals that were considered were received from the University of North Dakota, Energy and Environment Research Center, and from Washington State University (WSU), Biological Systems Engineering Department. North Dakota proposed to bring a transportable low oxygen biomass gasifier and a catalytic gas turbine to Washington and operate it for a brief period to provide a demonstration of current technology. WSU proposed to build a Novel Anaerobic Digester for Single or Co-Digestion of Dairy Manure and Municipal Wastes at the WSU dairy and combine the testing with dairy manure and food scraps and other organic solid wastes. Ecology organics specialists and engineering staff evaluated the proposals in a competitive ranking and scoring process.

The WSU proposal was selected as best meeting project criteria. The WSU project was to be constructed as a long term research facility on a transportable platform. The project provided substantial additional funding from across university departments, and a portion of a Vulcan

Foundation private grant to complete the proposal. An Interagency Agreement was established to complete the proposed project. The Biological Systems Engineering Department research team under the direction of Dr. Shulin Chen subsequently was awarded several additional grants from other sources providing substantially more funding for added development on the anaerobic digester. In May 2005, WSU requested a contract modification that would provide for the build out of a permanent digester at the dairy with the contract funds, and a commitment to build a transportable digester in the future with the additional funds. Ecology approved that contract modification.

WSU has completed the onsite construction and has proceeded with seeding the digester. The digester is designed to recover energy from the waste while recovering fiber from dairy solids that can be resold for potting soil as a replacement to peat moss. The unique approach will test strategies to substantially reduce overall capitalization cost, while optimizing methane gas production and recovery. The objective is to produce multiple products including fiber, fertilizer, recovered gas for energy, and a cleaned water that can be irrigated on crops or reused as dairy flush. Solid waste testing will be conducted in the future after the digester has been under operation. The transportable demonstration digester will be constructed including modifications after a period of testing the in-place digester.

Anaerobic Digester Constructed at the WSU Dairy Center

WSU Pilot-Scale Dairy Manure/Municipal Organics Anaerobic Digester

Cross Agency Support:
Renewable Resources to Bio-Products and Bio-Energy

Ecology SW&FAP staff have worked diligently over the past four years to develop a common set of goals and agency level support for *Beyond Waste* goals in recovery and utilization of organic wastes for bioenergy and bioproducts. Our goals are to encourage an understanding of biomass as a resource within state government agencies, to develop a state agency vision of how these resources may be best used, to develop support for renewable fuel, energy and products strategies with regard to organic wastes, to support common policy development and to seek appropriate funding for building industry capacity.

The initial steps taken by Ecology with Washington State University (WSU) through the completion of the Eastern Washington Biomass Inventory in 2003 and follow up with the

Statewide Inventory (2005) have now grown into a full state government bioenergy committee with monthly meetings and a lot of coordination. The Governor designated the Washington Department of Agriculture to lead the bioenergy efforts. Cooperative partners on the bioenergy committee are representatives from Department of Agriculture, Community Trade and Economic Development, Center for Sustaining Agriculture and Natural Resources (CSNAR), Center for Bio-products and Bio-energy (CBP&BE), WSU research and extension Energy Office, Office of Financial Management and Ecology. What a difference a year has made!

The steps taken by Ecology SW&FAP have proved to be a very strategic move in building state government support and implementation of *Beyond Waste* goals. This is reflected in the common language of bioenergy committee members who now speak about biomass as a resource in terms of a bioeconomy in Washington. Bioeconomy means utilizing our state biomass resources to build distributed business opportunities in the development of bioenergy, bioproducts and bioagriculture. This is one of the key moves in our state away from fossil fuels. In addition, WSU has developed a broad working team that is focused on building the bioeconomy. This includes research staff in Pullman, and staff at the CSNAR and CBP&BE. Ecology is now closely partnered as part of both teams. Internal efforts within Ecology have also been growing with links to the Hazardous Waste Program's permitting efforts on biodiesel, and the efforts of the Air Quality to find alternatives for agricultural field and orchard wood burning.

Our agency partners have also been busy at further developing a common understanding of the necessity for development of a renewable biofuels/bioenergy/bioproducts economy. To further these objectives the Center for Sustaining Agriculture and Natural Resources, and the Thomas S. Foley Institute on Public Policy and Public Service have put on workshops and conferences. Ecology has assisted in the sponsorship and development of these workshops and conferences this past year:

- Anaerobic Digestion, February 2005, Sunnyside Workshop. Main Sponsor - Center for Sustaining Agriculture and Natural Resources
- Global Oil Depletion and Implications for the Pacific Northwest, October 2005, Spokane Conference. Main Sponsor - Thomas S. Foley Institute on Public Policy and Public Service

Governor Gregoire gave the welcome address at the Global Oil Depletion Conference. In her opening remarks, the Governor provided support directly for anaerobic digestion and great encouragement to build a renewable energy economy in the state. Matt Simmons, Herman Franssen and other speakers at the conference stressed that petroleum that is inexpensive to extract is near depletion, and that a global peak in oil production is near. They also spoke of ever increasing petroleum demand, as the economies of central and east Asia continue to grow and prosper. A renewable energy and fuels solution is needed. An economy based on renewable resources is needed. Utilization of our organic "solid waste" resources can be a component of the broad solution needed.

Partnering for the Environment by Beneficial Use of Materials

Biosolids

Recycling/beneficial use of biosolids is the predominant management choice in Washington. The state 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. The department strongly encourages all producers of biosolids to pursue beneficial use.

Management of biosolids in the state is regulated primarily through chapter 173-308 WAC, *Biosolids Management* (the state biosolids rule), and the statewide *General Permit for Biosolids Management* (biosolids general permit). Implementation of the state biosolids program is accomplished primarily by Ecology staff with assistance from local health jurisdictions (LHJs). The biosolids rule and the first biosolids general permit went into effect in the spring of 1998. The original biosolids general permit was a five year permit that expired in May of 2003, but continued to be in effect until a new permit was finalized. A new biosolids general permit was finalized on June 5, 2005. This permit will not expire until June 5, 2010. The new permit contains several changes relative to the expired permit, but the management requirements are substantially the same.

Total production of biosolids within the state in 2004, was approximately 90,000 dry tons. Of this amount, approximately 85% was land applied; the majority of the remainder was incinerated, and less than 3% was landfilled. The amount of biosolids being stored from year to year is difficult to account for with our current tracking system and is not included in the above estimates.

Permit Program

The biosolids general permit governs the quality of biosolids which are applied to the land or transferred to other facilities and to practices at land application sites. In summary, biosolids must meet standards for pollutant limits, pathogen reduction, and vector attraction reduction appropriate to the intended end use. Biosolids destined for use in situations 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 350-400 facilities expected to require coverage 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 to or from another facility, or dispose of biosolids 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 include but may not be limited to private composting facilities that treat biosolids as a feedstock, beneficial use facilities (private parties who seek permit coverage

as a means of promoting their services by shifting administrative permitting burdens from their public/private clients), and central septage management facilities (some public and private facilities which accept septage from more than one pumper source).

Coverage under the general permit will be provided in two phases:

1) provisional approval, and
2) final approval

"Provisional" approval is obtained for any facility submitting a *Notice of Intent* and a complete *Application for Coverage* as provided for in the rule and 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 department review of the permit application and operating practices. In issuing final approval, the department may impose "additional and more stringent" conditions deemed necessary to ensure proper biosolids management. Any such conditions will be subject to appeal.

During the initial permit cycle, Ecology was able to issue final coverage to 85 of the facilities who applied for coverage. It is anticipated that a greater number of final approvals will be given during the new permit cycle.

Delegation to Local Health Jurisdictions (LHJs)

A total of eleven LHJs have accepted some degree of delegation for implementation of the state biosolids program. Those LHJs have entered into a formal *Memorandum of Agreement* with Ecology. The delegated LHJs have actively taken the lead in conducting various aspects of the biosolids management program within their jurisdiction. Most other LHJs provide varying degrees of assistance to Ecology. Funding and workload demands on staff continue to be the major reason cited by LHJs when choosing not to pursue delegation of the biosolids program. It is expected that shortfalls in county budgets and staff workload excesses will continue to be a barrier to our biosolids program delegation efforts.

Septage Management

A Septage Management Strategic Plan (SMSP)—funded by the 2002 Legislature—resulted in a series of recommendations to improve septage management within the state. There were three primary recommendations in this plan:

- All land application sites should be permitted.
- An effort should be made to clarify standard requirements for septage management to help gain public acceptance of the beneficial use of septage.
- Greater numbers of wastewater treatment facilities are needed that can and will accept septage for further treatment.

Implementation of the SMSP will require an expanded program for septage management, and this will require that Ecology make revisions to the state biosolids rule. The monetary resources

need to expand the septage program to meet the recommendations of the SMSP are not currently available.

Meetings among Ecology and LHJs following issuance of the SMSP resulted in an agreement that these agencies and the Department of Health (DOH) should work together to develop a broad package for presentation to the legislature to address septage issues in the state. It was recommended that the package include the concept of on-site system operations and maintenance, as well as regulatory aspects. The legislative request would need to include an equitable funding mechanism that would provide sufficient resources to sustain all aspects of the septage management program. The funding mechanism was a major issue throughout the development of the SMSP as well as for support of the original biosolids program.

Partnering for the Environment by Reducing Threats from Priority Waste Streams

State and local Governments Reduce Mercury Threat Together

Mercury was identified as a priority chemical for elimination due to toxicity, persistence, and readily available alternatives. Mercury, a powerful neurotoxin or brain poison, finds its way into the environment from industrial emissions and from mercury-containing products, such as thermometers and fluorescent lamps.

Though seafood is a nutritious food, national recommendations suggest that pregnant women and small children limit types of seafood consumption to one serving of albacore or chunk white tuna per week. They should not eat shark, swordfish, king mackerel, or tilefish, because they contain potentially unsafe levels of mercury. The Washington State Department of Health advises limiting consumption of all bass from our state lakes.

The *Beyond Waste Plan* also prioritizes eliminating the threat from mercury. The Washington State Department of Ecology (Ecology), the State Department of Health (DOH), many local governments and private businesses are working together to protect citizens from this toxin.

Starting in January 2006, it will be illegal to sell certain mercury-containing products in the State of Washington, including novelties, thermostats and thermometers.

Proper disposal of mercury products can protect infants, children and others by keeping mercury out of landfills, where mercury can be “methylized” and leached into the environment.

Thermostats

Each non-digital thermostat contains a minimum of 4 grams of mercury, which means collecting thermostats before they head to the landfill is an important way to protect human health and the environment.

Seven counties (King, Kitsap, Pierce, Snohomish, Spokane, Thurston and Walla Walla) are working together to remove mercury thermostats from the homes of their citizens. This project, with the help of grants from the Washington State Department of Health, uses the take-back program of the Thermostat

Recycling Corporation (TRC) and the voluntary services of individual heating, ventilation and air-conditioning (HVAC) contractors and wholesalers.

TRC is a private corporation established by thermostat manufacturers Honeywell, General Electric, and White Rodgers. HVAC contractors collect old thermostats and take them to wholesalers. Wholesalers accumulate the thermostats in protective bins supplied by TRC. When the bins are full, TRC pays for shipping to have them recycled in Pennsylvania. Forty-seven wholesalers around the state participate in this program. There has been a national Thermostat Take-Back program run by TRC for the last several years. New in the Spring of 2005 is the Contractor Take-Back program which allows any HVAC contractor with seven or more technicians to have a bin at their business, to facilitate collection, return and proper disposal at no cost to their business or county.

Fluorescent Tubes

Last year, the Northwest Product Stewardship Council lead a coalition of local and state governments to establish a product take-back system for reclamation and recycling of fluorescent lamps. The coalition included Local Hazardous Waste Management Program in:

- King County
- Kitsap County Solid Waste Division
- Snohomish County Human Services
- Snohomish County Solid Waste Management Division
- Thurston County
- Ecolights Northwest
- Northwest Energy Efficiency Alliance
- Puget Sound Energy
- Seattle City Light, and
- Snohomish County PUD

A lamp pilot program was kicked off January 18 – July 18, 2005. The goal of the pilot program was to test whether a retail-based system is a viable solution to increase recycling rates. The objective was to recycle 5% of fluorescent lamps expected to enter the waste stream next year in King, Kitsap, Thurston and Snohomish Counties, or about 30,000 linear tubes and 10,000 CFLs. (For more information see http://www.productstewardship.net/productsMercuryActivities.html.)

Other counties offer collection through their Household Hazardous Waste programs, allowing for at least one location for proper disposal of fluorescent tubes and bulbs. Skagit County has started up collection of fluorescent tubes for the first time, with funding from the Coordination Prevention Grant (CPG) program. Storage and handling of bulbs can often be difficult, and Snohomish County Solid Waste Management Division received a supplemental CPG grant to work on some recommendations for handling compact fluorescents.

Dental Projects

In Washington State there are about 2,600 dental offices. Before the dental-outreach initiatives led locally and by Ecology, less than ten percent of dentists statewide had installed separators.

King County, in 2003, passed a regulation for water-quality standards for dental amalgam waste in dental facilities. Since the regulation was passed, King County has had a 95 percent compliance rate. More information about the King County program is available at http://dnr.metrokc.gov/wlr/indwaste/dentists.htm. An MOU with Ecology and Washington State Dental Association was created modeled after King County's leadership. Additionally, the MOU has provided information to help dentists to make good decisions about amalgam disposal. Ecology is conducting a follow-up survey to judge the efficacy of these efforts.

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 solid waste handling decisions based on approved and "current" comprehensive solid waste management plans (RCW 70.95.110(1)).

These comprehensive plans detail and inventory all existing solid waste handling facilities within a county and provide an estimate of long-range needs for solid waste facilities projected over a 20-year period. The plans are intended to serve as a guiding document for a county to develop its infrastructure. Since 1989, counties and cities have been required to provide detailed information on waste reduction strategies and recycling programs and schedules for program implementation in the plans. 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 contiguous local governments, to prepare plans to manage moderate risk waste (MRW). By 1991, all local governments had submitted local MRW plans. Aspects included in every local MRW plan are Conditionally Exempt Small Quantity Generator (CESQG) Technical and Disposal Assistance, MRW Public Education, MRW Enforcement and Household Hazardous Waste (HHW) Collection.

In 1991, the Legislature enacted the *Used Oil Recycling Act*, chapter 70.95I RCW, which required local governments to amend their MRW plans to include household used oil.

Although the MRW plans are not required to be updated under the statute, or kept in current condition, some counties have revised their plans since first completed. In some cases they have combined their solid waste plans with their moderate risk waste plans. One of the recommendations of the *Beyond Waste Plan* is to fully implement local hazardous waste (MRW) plans.

Ecology provides technical assistance to local governments in preparing and implementing their plans. Ecology also approves the plans. Table 2.1 identifies the local solid waste plans and moderate risk waste plans for each county and two cities (Seattle and Everett) that do individual plans. This table shows the status of each local comprehensive solid waste management plan and moderate risk waste plan for each county, the year the plans were last approved, the waste reduction/recycling goals, whether the plans have been combined, and comments concerning future planning.

Table 2.1
Current Status of Solid and Moderate Risk Waste Plans in Washington
(as of September 2005)

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS MRW PLAN (date last approved)	MRW Plan Combined with SW Plan? (yes/no)	COMMENTS
Adams	Yes - 1993	50% WR/R BY 2012	1992	N	Comprehensive Solid Waste Management Plan (CSWMP) updated April 2005. MRW Plan is joint among Adams, Lincoln and Grant Counties.
Asotin	Yes - 1998	26% by 1997	1993	N	No comment
Benton	Yes - 1994	35% by 1995	1991	Y	Currently updating CSWMP
Chelan	Yes - 1995	26% by 1995	1991, used oil amendment 1996	N	Hired contractor to begin update in 2003, should complete the plan in 2006
Clallam	Yes – 2000	20% by 1996 40% long range goal	1991	Y as of 2006 update that is not yet adopted (9/25/05	Implementation. Currently in review. Will be updating to reflect change from landfill (scheduled to close 12/05) to transfer station, expected construction to be complete 2006. Updating MRW Plan. Preliminary Draft CSWMP expected 12/05. Final plan expected mid 2006.
Clark	Yes – 2000	50% WRR by 1995	2002	Y	Currently updating CSWMP, will be only amending current SWMP. Draft language is complete and out to cities for input.
Columbia	Yes - 2003	20% WR/R	1991	N	Plan approved
Cowlitz	Yes – 2000	50% WRR by 1995	1993	N	Are about halfway through update, preliminary draft SWMP expected 12/05, final plan mid 2006.
Douglas	Yes - 2002	25% by 2008	2002	Y	Plan approved, beginning plan update process for 2007.
Ferry	Yes - 1993	35% WR/R by 1995 50% WR/R by 2013	1994	N	No information on current status.
Franklin	Yes - 1994	35% R by 1995 5% WR by 1998	1993	N	Currently updating CSWMP. Not using a consultant.
Garfield	Yes - 1993	26% WR/R by 1997	1992	N	Currently updating CSWMP, first draft complete

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS MRW PLAN (date last approved)	MRW Plan Combined with SW Plan? (yes/no)	COMMENTS
Grant	Yes - 1995	22% WR/R by 2000	1992	N	Currently updating 1999 CSWM Plan. MRW is joint among Adams, Lincoln and Grant Counties.
Grays Harbor	Yes - 2001	50% WRR by 1995	1991	N	Will begin plan review in 12/05.
Island	Yes - 2000	Assist the State in achieving its goal of 50%	2000	Y	Latest CSWMP approved December 7, 2000. The MRW plan was incorporated and updated in the 2000 CSWMP
Jefferson	Yes - 2000	Minimum 29% long range	1991 – 1999 Operations Guide	N	In plan review, Preliminary Draft Plan expected 3/06.
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 MRW plan remains independent and is administered by the Local Hazardous Waste Management Program. CSWMP revision beginning 2005.
Seattle	Yes - 2005	Recycle or compost: 60% of all waste generated in Seattle by 2008	1997	N	Because the City of Seattle and King County have independent CSWMPs, the MRW 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 MRW Management Plan. The text is fully integrated into the 2000 CSWMP
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 by 2007

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS MRW PLAN (date last approved)	MRW Plan Combined with SW Plan? (yes/no)	COMMENTS
Lincoln	Yes - 1992	35% WR/R by 1997	1992	N	Amended CSWMP 1999. MRW Plan is joint among Adams, Lincoln and Grant Counties.
Mason	Yes - 1998	35% WRR by 1998	1991	N	Review due, no SWAC, Planner in contact with County.
Okanogan	Yes - 1993	30% by 2000	1991	Y, in current draft	Currently updating CSWMP, waiting for plan update to come in for final approval
Pacific	Yes – 2000	32% WRR by 1996	1990 – 2000 Operations Plan	N	Plan review and update completed by County, Planner waiting for complete review packet before starting 120 day clock for Preliminary Draft Review.
Pend Oreille	Yes - 2002	45% WR/R by 2015	1993	N	Plan approved
Pierce	Yes – 2001	50% WRR by 1995	1990	N	Implementing Plan update during 2006-07
San Juan	Yes - 1996	50% by 1995	1991	N	Currently updating CSWMP
Skagit	Yes - 1994	50% or better by 1995	1992	N	Draft CSWMP reviewed by Ecology 2004. Awaiting final submittal to Ecology. Anticipated in September of 2005.
Skamania	Yes – 2002	40% WRR by 1998 50% long range goal	2001	Y	Currently 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 MRW Plan, to update but not replace it.
Everett	Yes - 1996	35% recycling by 2005 3% to 5% WR	1993	N	Everett no longer intends to join Snohomish County SW plan, but adopted the Snohomish MRW plan.
Spokane	Yes - 1998	50% Recycling by 2008	1993	N	Currently updating CSWMP.
Stevens	Yes - 1994	36% WR/R by 2012	1993	N	Currently updating CSWMP.

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS MRW PLAN (date last approved)	MRW Plan Combined with SW Plan? (yes/no)	COMMENTS
Thurston	Yes - 2001	Increase recycling rate by 2.5% by 2005	1993	N	In revision process, plan to create model plan that is complimented by State Beyond Waste Plan. Final plan on track for 12/06.
Wahkiakum	Yes - 2003	20% WRR by 1996	2001	N	Plan approved
Walla Walla	Yes – 1994	40% by 2002	1991	N	Currently updating 1994 CSWMP. Approximately 60% completed. Incorporating MRW Plan as a section of revised CSWMP.
Whatcom	Yes – 1999	50% diversion	1991	N	The City of Bellingham is the lead on MRW.
Whitman	Yes – 1997	40% WR/R by 2001	1992	N	Preliminary Draft submitted and comments returned to County on CSWMP.
Yakima	Yes – 2003	35% by 2005 40% by 2007	1991	N	Plan approved

Partnering for the Environment through Financial Assistance

Coordinated Prevention Grants (CPG)

Coordinated Prevention Grants are funded from the Local Toxics Control Account (LTCA) authorized by RCW 82.21.030. The legislative intent of the CPG Program is to: fund local government projects that prevent or minimize environmental contamination in compliance with state solid and hazardous waste laws and rules; provide funding assistance for local solid and hazardous waste planning and for implementation of some projects in those plans; encourage local responsibility for solid and hazardous waste management and improve efficiency, consistency, reliability, and accountability of grant administration; and promote regional solutions and intergovernmental cooperation.

Funding for CPG comes from the LTCA, which derives revenue 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 must be divided into two portions, 80% for Solid and Hazardous Waste Planning and Implementation grants and 20% for Solid Waste Enforcement grants.

Eligible applicants for CPG grants include:

- local planning authorities,
- agencies designated as lead implementation agencies for Local Comprehensive Solid Waste Management Plans; and
- jurisdictional health departments and districts (JHDs).

Ecology allocates the available funds on a countywide 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 may receive funding up to the population per capita allocation for their city. The availability and amount of funding depends upon legislative appropriations to the Account.

The current Coordinated Prevention Grant cycle began on January 1, 2004 and will end December 31, 2005. For the 2004-05 grant cycle, $18,016,251 was awarded for 121 grants to Washington counties, cities and public health jurisdictions. The grant funds were distributed as follows:

Waste Reduction/Recycling	$ **7,017,416**
Solid Waste Enforcement	$ **2,819,228**
Moderate Risk Waste	$ **8,179,607**
Total LTCA	$ **18,016,251**

A new 2006-07 Coordinate Prevention Grant cycle begins on January 1, 2006. Ecology will award CPG grants in two cycles: the regular cycle and the off-set cycle. The regular cycle is for grants in effect from January 1, 2006, through December 31, 2007. The off-set cycle is for

grants in effect from January 1, 2007, through December 31, 2008. Off-set cycle grants remain part of the 2006-2007 LTCA allocation.

- **Regular Cycle.** Ecology allocates regular cycle funds based on the 80% allocation for Solid and Hazardous Waste Planning and Implementation grants and 20% for Solid Waste Enforcement grants. CPG funds are distributed to recipients that request their full or partial allocation in the regular cycle.
- **Off-Set Cycle.** Funds for the off-set cycle come from funds that are not requested in the regular cycle ("unrequested" funds) and funds that are not spent during the regular cycle ("unspent" funds). Ecology awards off-set cycle funds through a competitive process and will use additional criteria to decide which projects are awarded funds in the off-set cycle.

Program Update

The 2006-2007 CPG cycle continued implementation changes to improve the grant program. The primary driver behind the changes to the CPG Program during the last grant cycle was the 2001 legislative investigative report titled, *Investing in the Environment: Environmental Quality Grant & Loan Programs*. This report resulted in House Bill 1785 and requires Ecology to implement Joint Legislative Audit and Review Committee (JLARC) recommendations for changes to the CPG Program. Recent changes to the CPG Program have also been influenced by input from the CPG Workgroup, grant recipients, Ecology staff, and the *Beyond Waste Plan* (Washington State Hazardous Waste Management Plan and Solid Waste Management Plan, Publication # 04-07-022).

The CPG Workgroup gathered input from local governments at the 2004 State Solid Waste Summit and through workgroup meetings in order to implement the House Bill 1785 and JLARC recommended changes. The CPG Workgroup is a committee of local government grant recipients and Ecology grant staff who work together to refine and enhance the CPG Program.[2] The primary changes to the CPG Program for the 2006-07 CPG cycle include:

- New minimum threshold score for grant applications
- Updated application forms
- New off-set cycle and criteria for the off-set cycle
- Updated process for awarding funds in the off-set cycle
- New report forms
- New information sharing database called the "Information Clearinghouse" (see Partnering for the Environment through Education and Information Sharing below for more details)

Local Government Efforts Implementing Beyond Waste Vision using CPG Funds

[2] Grant recipients who are interested in participating in or providing feedback to the CPG Workgroup should contact Lydia Lindwall, at llin461@ecy.wa.gov.

Below are just a sample of the types of programs local governments are implementing that support the *Beyond Waste* vision:

King County Northwest Natural Yard Days

CPG funds are continuing to help support King County's Northwest Natural Yard Days program. This program is in its eighth year and its success is largely due to its strong partnerships among state and local government agencies, cities, and local water providers. King County takes advantage of a variety of environmental education opportunities as well as offering economic incentives to help promote natural yard care products and practices.

This program parallels many of the *Beyond Waste* initiatives as well. It encourages residents and businesses to recycle their yard and food waste into nutrient-rich compost that can be used as a natural soil amendment while diverting valuable material from our waste stream. In addition, the County promotes natural, non-toxic fertilizers and pest-management options that limit the need for toxic chemicals.

For more information on King County's Northwest Natural Yard Days program, visit http://www.metrokc.gov/dnrp/swd/naturalyardcare/yard-days.asp

City of Seattle Natural Soil Building

CPG funds are helping to support the City of Seattle's Natural Soil Building program. Seattle collaborates with King County to carry out the program with activities that include: recruiting and training city residents as "Master Soil Builders" and "Master Composters" to help target specific neighborhoods; distributing natural yard care educational materials and home composting bins; and conducting the continuing "Home Organics Waste Management Survey" to collect longitudinal data on their program accomplishments.

Like King County's Natural Yard Days, this program has many *Beyond Waste* elements. It encourages residential composting as well as the use of commercially-made compost as a natural soil amendment. The city also promotes natural, non-toxic fertilizers and pest-management options that limit the need for toxic chemicals.

For more information on the City of Seattle's Natural Soil Building program, visit http://www.ci.seattle.wa.us/util/Services/Yard/Natural_Lawn_&_Garden_Care/Growing_Healthy_Soil/index.asp

Collection of Fluorescent Bulbs and Cathode Ray Tubes

Thurston County (Department of Water and Waste Management) utilizing some CPG funding developed programs to encourage producer responsibility for the collection of two hazardous materials:

- fluorescent bulbs in 2004 and
- unwanted Cathode Ray Tubes (CRTs) in 2005 while providing education for the public on how to safely handle these materials.

Thurston County joined the Lamp Coalition, a subcommittee of the Northwest Product Stewardship Council, that allows jurisdictions across the Puget Sound region to work together to encourage producer responsibility. Utilities are also partners in the Lamp Coalition, and Puget Sound Energy (PSE) is sponsoring a $0.50 coupon on purchase of new compact fluorescent bulbs when people bring in up to four bulbs to recycle.

Training is provided at each participating store by a King County consultant and by the recycling firm, Ecolights, when Ecolights delivers collection bins.

Letters were mailed to retailers in July of 2004, and four take-back sites were confirmed. Two of those offered free recycling to their customers; two were concerned about the added $70 per trip transportation cost. Coordination with the county's HazoHouse enables retailers the option to bring collected tubes to the HazoHouse at no extra charge rather than paying the $70 transportation charge to Ecolights. The coordination was possible because Ecolights is the recycling vendor for the bulb take-back project and is also the company that collects CRTs and bulbs from HazoHouse.

Three confirmed sites actually began the project in January of 2005: Tenino Ace Hardware, Olympia Ace Hardware on the Westside of town, and Olympia Supply Company in the downtown area. Through the end of May 2005, Ecolights reported that they recycled 289 bulbs (most were 4-ft fluorescents and only one compact fluorescent).

Publicity campaigns were conducted to promote the project including: a live radio interview on March 4; a press release on March 14; regular ads in the Olympian, Tenino Independent, and Nisqually Valley News; and, brochures that were developed and distributed at community events.

The Recipient used "Secret shoppers" to "test" the project at the West Olympia Ace and found that store staff were informed about the project and it was easy to use.

Unless storage space becomes an issue, the project will continue and expand to other retail outlets.

Grants to Citizens - Public Participation Grants (PPG)

Washington's chapter 170.105D RCW, *Hazardous Waste Cleanup - Model Toxics Control Act*, provides for a Public Participation Grant program. 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 two types of waste grant issues:

- **Cleaning up hazardous waste sites.**
- **Carrying out the state's solid and hazardous waste management priorities.**

Public Participation Grant projects motivate people to change their behavior and take action that will improve 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.

The PPG program writes grants for either one year 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.

For the July 1, 2003, through June 30, 2005, grant period, Ecology initially offered 32 groups/organizations Public Participation Grants. One grant recipient declined the grant offer due to changes in their organization. This left 31 entities accepting the grant offers for a total of $808,000 for the biennium. These funds provided fifteen (15) grants for cleanup of hazardous waste sites and sixteen (16) grants for carrying out solid/hazardous waste pollution prevention education management priorities.

Moving Toward Sustainability

The Solid Waste and Financial Assistance Program is turning its focus more toward sustainability initiatives, initiatives that are more efficient and effective because they prevent waste rather than manage it. The PPG program has been and still is providing support to projects that are focused toward various levels of sustainability. The following grants issued in the 2003-2005 biennium provided support to projects that were moving toward sustainability in their community or a specific business/industry.

Toxics Reduction Initiatives

- **Citizens for a Healthy Bay –** Educate the community about pollution problems and encourage involvement in solving the problems and participating in the Commencement Bay Cleanup processes and initiate sustainable practices.
- **Washington Toxics Coalition –** Provide the educational tools for the community to be aware of the dangers of pesticides and hazardous household cleaning products and know that there are options to using these products.

Sustainability and Public Education

- **Northwest Renewable Energy Festival –** Sponsor a three-day Energy Festival to inform and educate energy producers and consumers about the benefits of using renewable energy sources.
- **Washington Citizens for Resource Conservation –** Provide education and outreach on computer recycling and design issues related to producer responsibility.

Business Redesign

- **Justice Alliance Education Fund** – Provide an avenue for educating those who manage public institutions on the benefits of practicing energy conservation and waste stream management.

- **Washington State Recycling Association** – Provide education on ways to increase recycling programs in rural areas in Washington State.

Past Grants Supporting Sustainability

Public Participation Grants continue to support sustainability projects. Below are only a few of the projects funded by these grants.

Toxics Reductions Initiatives

Fremont Neighborhood Council 1992
Washington State Pest Control Association 1995
The Green Zone 1999
Clark County Hazardous Waste Citizen Task Force 2001
Citizens for a Healthy Bay 2001
Puget Soundkeeper Alliance 2003
Washington Toxics Coalition 2003
Citizens for a Healthy Bay 2005
Washington Toxics Coalition 2005

Sustainability and Public Education

The Latona School United Parents 1993
Washington Toxics Coalition 1996
Inland Empire Public Lands Council 1997
RE Sources/The RE Store 1999
Lake Roosevelt Forum 2000
Three Rivers Children's Museum 2000
Community Services Work Group 2003
Lake Roosevelt Forum 2003
NW Renewable Energy Festival 2005
WA Citizens for Resource Conservation 2005

Business Redesign

Washington Citizens for Recycling 1993
Economic Development Association of Skagit County 1994
Associated Industries of the Inland Northwest 1995
Cascadia Revolving Fund 1995
Automotive Recyclers of Washington 2003
Washington State Recycling Association 2003
Justice Alliance Education Fund 2005
WA State Recycling Association 2005

CDL/LEED Certification

Sustainable Design Council 1993
Sustainable Building Collaborative 1993
Energy Outreach Center 1997
Resource Efficient Building & Remodeling Council 1999
Northwest EcoBuilding Guild 1999
Justice Alliance Education Fund 2005

Partnering for the Environment through Education and Information Sharing

Washington State Solid Waste Information Clearinghouse

Ecology is well underway, working with several representatives from local government, developing the web-based "Washington State Solid Waste Information Clearinghouse". The web-based "Information Clearinghouse" will allow CPG recipients to report work accomplished online and to share lessons learned with other grant recipients statewide. The system is being designed to collect and maintain information that profiles existing county and city programs, allows sharing of tools and resources developed through various projects, and facilitates sharing of success and failure stories to help everyone strengthen their own programs. The initial planning by the committee has been completed and work is on track to have the system up and running in 2006.

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. The types of information that will be available include:

State Profile
Statewide summaries of county and city programs and planning status, facility information, waste generation, recycling and disposal figures, litter collection efforts, and Ecology-funded solid waste grants.

County and City Profiles
Specific county and city information including demographics, contacts, lists of solid waste activities, planning status, what and where citizens can recycle, disposal data, household hazardous waste collection, and information about solid waste facilities. Local governments will have access to online reporting for their Coordinated Prevention Grant (CPG).

Projects
A searchable database of local government and nonprofit project descriptions, approaches, resources developed, results, and whom to contact for more information.

Outreach Materials
Materials prepared for public education and outreach such as brochures, posters, and print material.

Resources
Useful Web sites, books, and organizations suggested by local governments.

Tool box
Resources to help local governments do their job, such as best management practices, studies, procedures, sample contracts, ordinances, and resolutions.

Contact Search
Solid waste professionals and their expertise.

Calendar of Events
A calendar of conferences, meetings, training opportunities.

Classifieds
Job postings, surplus materials, and want ads.

The Information Clearinghouse will help tell the story of solid waste in Washington, include Coordinated Prevention Grants program information in an easy to find format, provide an opportunity to showcase local programs, facilitate learning from others' mistakes and successes, will archive and provide institutional memory for the state and local governments, will help eliminate "recreation of the wheel" and broaden the resource pool, will help managers cut down on the learning curve for new staff, will help small counties feel less isolated and more connected and will provide that "fresh from a conference feeling" anytime you need some inspiration or new approaches—all with a click of a mouse.

If you want to learn more about the Information Clearinghouse, provide feedback, or have questions, please contact Shelly (McClure) McMurry, project coordinator, at (360) 407-6398 or smcc461@ecy.wa.gov.

Compost Facility Operator Training

Ecology views operator training as an essential component of a successful composting industry. Ecology supports the Washington Organic Recycling Council (WORC) in administering a well-received training workshop, usually held in the fall. In 2001, WORC revised the five-day curriculum to focus on the biology of composting, reinforced with hands-on field activities. The new format continues to receive enthusiastic reviews by workshop participants.

Another important change in the compost operator training curriculum is the emphasis on "starting with the end in mind." Composting must be viewed as an activity designed to create valuable products, not just get rid of solid waste. Analyzing end-use markets is an important beginning step in planning any composting operation. Developing and expanding end-use markets for compost products is critical for closing the loop for recycled organic materials. By including substantial training on the value of compost products during the operator training, we are building a critical mass of people who understand the importance of compost end-use in protecting the environment.

The October 2005 training was filled with 32 people from all around Washington State, including one attendee from Colorado and a couple of folks from Oregon. The trainees represented compost facility operators, owners and regulators from various health districts; additionally, Washington State University, The Evergreen State College, Seattle Pacific University and Colorado State University. In addition to the knowledge gained, invaluable relationships and networks were created; the "regulator vs. operator" barriers were removed as all participants learned about large scale composting at the same pace.

Operator Certification Program

In Washington State, solid waste landfills and incinerators are required to have certified operators on site at all times, per chapter 70.95D RCW, *Solid Waste Incinerator and Landfill Operators.* The Landfill and Incinerator Operator Certification program was created by the Legislature in 1989, through the "Waste Not Washington Act." The implementation rule was adopted 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, and
- all incinerators that burn solid waste

The law also requires that any person inspecting an applicable solid waste facility must be certified.

Course offerings began in 1992, with those taking the course and passing the test receiving certifications of competency for three years. Yearly training courses were held on landfill and incinerator operations until 1995. Direct funding for implementing this program at Ecology is not available. Because of reduced staffing, a home study course was instituted. This not only reduced the level of effort for Ecology, it provided a cost savings to those who took the course. The certification training, however, no longer focused on Washington-specific issues for both operators and inspectors.

In February 2004, an agreement was reached 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 is responsible to notify interested parties of upcoming training and testing and notifying all interested parties of the changeover and SWANA responsibilities 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 380 have been certified for incinerator operations. Certifications renewals began in 1994.

There continues to be a significant decrease in the number of persons taking the landfill and incinerator courses since 1995. The reduction in the number of certified landfill and incinerator operators can be attributed to a reduction in the number of landfills and incinerators since the program began.

Recognizing Waste Reduction and Recycling Efforts: Terry Husseman Sustainable School Awards

On May 13, 2005, at the State's Capitol Rotunda, Ecology's Director, Jay Manning and Solid Waste and Financial Assistance Program Manager, Cullen Stephenson, presented $20,000 in cash awards to 19 schools from across the state. Over 75 schoolchildren attended and celebrated their schools' exceptional efforts to conserve resources, reduce waste, and preserve the environment. Award amounts ranged from $100 to $3,500.


Mrs. Terry Husseman

The award program, open to all Washington state kindergarten through 12th grade public schools, recognizes them for successfully managing and using materials in a sustainable fashion. Schools are judged on the creative features of their programs, their purchasing practices, and their overall success at reducing waste and increasing recycling. The program rewards schools and teachers for developing innovative curriculums or operating longstanding programs. Additionally, schools that submit outstanding plans for future programs will receive seed money to assist with start-up costs.

Many of the programs are recycling efforts geared toward reducing schools' garbage by 50 percent or more. More specific programs include Olympia High School, where a retention pond long used as a weedy trash pit was restored to a place of natural beauty, and Paul Rumburg Elementary School, where an award will help revive an ambitious recycling project that a fifth grade class launched three years ago but was unable to maintain on its own.

The three categories of awards are Seed Award, Sustainable School Award and Environmental Curriculum Award.

- The **Seed Award** assists schools with the costs of starting up programs. Ten awards, ranging from $100 to $3,500, were presented.
- The **Sustainable School Award** acknowledges schools with ongoing waste-reduction or recycling programs. Nine schools were presented with awards ranging from $400 to $750 each.
- The **Environmental Curriculum** category encourages schools to develop curricula to teach environmental awareness in Washington schools. No applications were submitted for this award, so the money was used to provide additional awards under the other two categories.

Most of the schools who were award recipients were present for the celebration. Members of the audience included Senator Linda Evans-Parlette, Representatives Jan Shabro and Brendan Williams, and Mrs. Terry Husseman.

Many schools practice environmental stewardship with school-based beautification projects. School recycling programs often extend into the local communities. In several cases, the school program is the largest recycling effort the community has, and the reason why local citizens, businesses, and tribes are staying involved in the recycling effort. The map shows the school awards by county. Table 2.2 identifies the 2004-2005 school year winners of the "Terry Husseman Sustainable School Awards."

Table 2.2 Award Winners for the 2004-05 School Year

Schools	Amount
Seed Award	
South Whidbey Public Schools, Island County	$ 100
Havermale High, Spokane County	$1,500
Icicle River Middle, Chelan County	$1,500
Reardan-Edwall Schools, Lincoln County	$2,000
Zillah Intermediate, Yakima County	$3,150
Aki Kurose Middle, King County	$1,900
Poulsbo Elementary, Kitsap County	$ 500
Canyon Creek Middle/Cape Horn Skye Elementary, Skamania County	$3,500
Paul Rumburg Elementary, Chelan County	$ 700
Ilalko Elementary, King County	$ 250
Acme Elementary, Whatcom County	$ 400
Chautauqua Elementary, King County	$ 750
Sustainable School Award	
Harmony Elementary, Whatcom County	$ 400
Issaquah Valley Elementary, King County	$ 650
Kendall Elementary, Whatcom County	$ 400
Komachin Middle School, Thurston County	$ 400
Mt. Baker Junior & Senior High, Whatcom County	$ 400
Olympia High, Thurston County	$ 750
Pasadena Park Elementary, Spokane County	$ 750

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

The Closed-Loop Scoop Newsletter

The Solid Waste and Financial Assistance Program (SW&FAP) publishes a statewide quarterly newsletter called *The Closed-Loop Scoop*. This newsletter provides a mechanism to relay important information to public works departments, health districts, private recyclers and other clients and stakeholders. All SW&FAP staff and local government personnel are encouraged to contribute articles to help readers stay current on legislative matters, share program successes and ideas, and announce upcoming meetings. The newsletter is sent to over 700 individuals and organizations across the state, with many parties opting to receive their copy electronically. *The Closed-Loop Scoop* can also be found on the Ecology SW&FAP Homepage, http://www.ecy.wa.gov/programs/swfa/nav/publication.html.

The Closed-Loop Scoop newsletter should not create waste. If you would like to receive a copy of the newsletter via e-mail, please send a message to jbil461@ecy.wa.gov with the subject line reading "Subscribe Closed-Loop Scoop".

Recycling Information Line

The Solid Waste & Financial Assistance Program (SW&FAP) operates 1-800-RECYCLE to help citizens find ways to reduce waste and recycle. In 2004, almost 9,000 callers were assisted. 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 provided, along with information on locations for the recycling of construction, demolition, and landclearing debris. Referrals are made to companies that offer commercial pickup for business recycling. Targeted waste streams, such as electronic scrap and items containing mercury, continue to offer the information line increased opportunities. The information line database also includes resources for such items as compost bins, compost, and rain barrels that might be available for purchase from the recycler.

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. A database is maintained by periodically contacting all recyclers to determine commodities accepted, fees if any, and hours. Basic household recycling information from the database can be found at the information line's own Web site: http://1800recycle.wa.gov. Links to other on-line databases and exchanges, along with local government and recycling company Web sites, are also listed.

Other sections of the SW&FAP Web site provide information on using recycled content building materials and sustainable building materials (http://www.ecy.wa.gov/programs/swfa/cdl/index.html) 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/.

Walking Our Talk at Ecology

On-site Composting at Ecology

Headquarters (HQ) and Southwest Regional Office (SWRO)

The Ecology HQ/SWRO building successfully started diverting organic scraps from the café, kitchen and employee coffee bars on August 23, 2005. Ecology's Director, Jay Manning presided over the official compost kick-off event and provided words of thanks to the dedicated team that has worked on this project for several years. During the event, Jay deposited the first container of food scraps, signifying the momentous transition from the volunteer composting program to the institutionalized on-site composting program.

This composting project provides Ecology with an opportunity to "walk the talk" and demonstrate progress on one of the *Beyond Waste* initiatives: establishing a viable closed-loop recycling system for organic residuals. A key component of the project is development of best management practices (BMPs) for food waste composting at institutions.

"The kitchen trash was up to here before we started composting"

Earth Tubs at the Compost Center

The HQ/SWRO project is operational and processing approximately 100-pounds of organic scraps per day. The organic scraps are collected nightly by janitorial staff and the next day the scraps are processed in the Earth Tub by the grounds maintenance contractor. In addition to the daily processing, support for the program comes from "Compost Champions" spread through out the building. These volunteers are able to answer questions about the program from people in their areas. Composting on-site is reducing our solid waste and the ongoing costs associated with disposal. The compost product will be used on the building grounds and distributed through a lottery system to some of the product to Ecology employees.

Eastern Regional Office (ERO), Spokane, WA

In August 2005, staff throughout the ERO office began collecting organic material to feed worms in the Worm Wigwam. The Worm Wigwam is capable of recycling 7 to 14-pounds of organic material per day into a nutrient-rich soil amendment, a.k.a. worm compost. The worm compost is used on ERO's grounds for landscaping, for employees' personal potted plants, or is donated to other groups. Each coffee bar and lunch is equipped with a covered 3-gallon bucket to collect food scraps (except meat and liquids) and other plant-based materials, such as fruits, vegetables, and paper towels. Volunteers empty the collection buckets on a weekly or twice-weekly basis.

Worm Wigwam

Northwest Regional Office (NWRO), Bellevue, WA

BioStack Vermicomposter

The lunch room at NWRO is equipped with one covered coffee grounds bucket and covered food scrap bucket. The coffee grounds are kept separate because they will hold longer if it is determined that the system is being overloaded with other scraps. The collected food scraps typically includes peelings, rinds, unwanted fruits, veggies, bread, napkins, tea bags and floral scraps. Volunteers empty the buckets every other day, chop the scraps into small pieces then add them to a BioStack vermicompost system. This system can handle about 8-pounds of chopped material per addition, depending on season (if it is warm outside the worms are more active and will eat a greater volume of material). The staff uses the worm castings to enrich employees' home gardens and NWRO's public demonstration garden.

Central Regional Office (CRO), Yakima, WA

A group of CRO Ecology employees developed a voluntary compost program. Each week the volunteers take food scraps from their office kitchen area and add them to their own home compost piles. The compost buckets in CRO's kitchen areas have tight lids for holding the food scraps for as long as a week. This voluntary system diverts approximately 5-pounds of food waste from the dumpster each week.

Our Daily Office Practices Meet Up With "Sustainability"

Central Regional Office Sustainability Team

In 2005, the Central Regional Office Sustainability Team worked to maintain existing waste reduction and recycling programs and worked to determine what the office could do to increase energy conservation. Some of the team's accomplishments include:

- Maintaining a voluntary composting program, where food scraps are collected under each kitchen sink and taken home weekly by volunteers for use in their own worm bins. As of September 2005, the Team has collected approximately 450-pounds of food scraps.
- Participating in an Earth Day event at Chief Joseph Dam where about 100 children learned about clean air, water quality, water conservation, and vermicomposting.
- Working with Pacific Power to determine the energy efficiency of the Central Regional Office Building. It was determined that the office building, which is an old fruit warehouse, is highly efficient.
- Brown bag lunches where staff can come listen, learn about, and discuss sustainability while eating their lunch.
- All potlucks now have a zero waste theme, where reusable plates and utensils are encouraged via e-mail and at the potluck.

Northwest Regional Office Sustainability Team

- Continue to maintain the BioStack vermicomposting for employees' food scraps. This system can handle about 8-pounds of chopped material per addition, depending on season (if it is warm outside the worms are more active and will eat a greater volume of material). The staff uses the worm castings to enrich employees' home gardens and NWRO's public demonstration garden.
- On Earth Day staff brought in plants for a plant exchange

Southwest Regional Office and Headquarters Sustainability Team

- Ecology HQ/SWRO building successfully started diverting organic scraps from the café, kitchen and employee coffee bars August 2005 processing approximately 100-pounds of organic scraps per day.

Eastern Regional Office Sustainability Team

- In August 2005, staff throughout ERO began collecting organic material to feed worms in the Worm Wigwam. The Worm Wigwam is capable of recycling 7 to 14-pounds of organic material per day into a nutrient-rich soil amendment, a.k.a. worm compost. The worm compost is used on ERO's grounds for landscaping, for employees' personal potted plants, or is donated to other groups.

Chapter III
Solid Waste Handling Infrastructure

This chapter describes the basic facilities making up the solid waste management infrastructure in Washington State. This chapter includes facilities permitted under the following regulations:

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 became effective 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 solid waste handling facilities.

Solid waste facilities that have been permitted in the past under the *MFS* are now required to either be permitted under the requirements of chapter 173-350 WAC, *Solid Waste Handling Standards*, or to close under the requirements of the *MFS*. Effective dates of applicability to existing solid waste facilities are identified in WAC 173-350-030(2). Essentially the requirements for facilities existing at the time of the effective date of the regulation (February 2003) are:

- Within 24 months meet all applicable operating, environmental monitoring, closure and post-closure planning, and financial assurance requirements.
- Within 36 months meet all applicable performance and design requirements, other than location or setback requirements.
- Within 18 months initiate the permit modification process in WAC 173-350-710(4)
- An existing facility completing closure within 12 months of the effective date shall close in compliance with the *MFS*. Any facility not completing closure within the 12 months shall close in compliance with chapter 173-350 WAC.

In Washington State, all but the permits for an ash monofill are issued by local jurisdictional health departments. Ecology is responsible for the preparation of the solid waste regulations and has a permit review function.

This chapter presents information about solid waste facilities as of September 2005. Table 3.1 identifies the applicable regulatory citation for various solid waste facility types and compares them to the former classifications under chapter 173-304 WAC. The citations for the new

requirements under chapter 173-350 WAC are included or in some cases (such as woodwaste landfills) it is indicated that the particular facility type does not exist under the new regulation. There have been no changes to the municipal solid waste landfill or ash monofill requirements.

Table 3.1
Regulatory Requirements for Solid Waste Facilities

Facility types formerly found under *chapter 173-304 WAC*	**Where found under *chapter 173-350 WAC***
Municipal Solid Waste Landfills	Under chapter 173-351 WAC
Inert/Demolition Waste Landfills	Inert landfill only with very specific definitions of inert waste under 350-410. Demolition waste would be allowed for disposal in an MSW landfill or a Limited Purpose Landfill only
Limited Purpose Landfills	Limited Purpose Landfills are under 350-400
Woodwaste Landfills	No longer a landfill classification. Wood waste would be allowed for disposal in an MSW landfill or a Limited Purpose Landfill only
Composting Facilities	Under 350-220 (some are exempt from permitting)
Recycling Facilities	Either recycling facilities under 350-210 or material recovery facility (exempt from permitting) under 350-310
Recycling Facilities - Land Application	Land Application sites under 350-230
Landspreading Disposal Facilities	"Disposal" on land is no longer allowed. If beneficially used falls under 350-230
Energy Recovery and Incineration Facilities	Under 350-240
Compacting Stations	Under 350-310
Drop Boxes	Under 350-310
Transfer Stations	Under 350-310
Piles	Under 350-320
Surface Impoundments	Under 350-330, also tanks
Tire Piles	Under 350-350
Moderate Risk Waste Handling Facilities (under 304 they were permitted as intermediate handling facilities)	Under 350-360
Other	Under 350-490

For 2005, Ecology has identified 665 solid waste handling facilities in Table 3.2. In addition to permitted facilities, there are provisions under *chapter 173-350 WAC, Solid Waste Handling Standards* for facilities that are exempt from permitting, if they meet certain conditions. Some recycling processors and intermediate recycling facilities are exempt and are included in the facility count this year. In addition, there are some exempt composting facilities that are also included. As facilities are transitioning to the new standards, and Ecology is developing a new data tracking systems, the numbers of facilities will be more accurately identified in the future.

Table 3.2
Facility Types Statewide

Facility Type	Statewide Total
Ash Monofill	1
Municipal Solid Waste Landfills	17
Inert Waste Landfills	29
Limited Purpose Landfills	10
Composting Facilities (permitted)	39
Composting Facilities (exempt)	3
Recycling Processors (exempt)	134
Intermediate Recycling Facilities (exempt)	128
Intermediate Recycling Facilities (permitted)	37
Land Application	18
Energy Recovery and Incineration Facilities	4
Drop Boxes	63
Transfer Stations	107
Piles	23
Surface Impoundments	0
Tire Piles	2
Moderate Risk Waste Handling Facilities	50
TOTAL ALL FACILITIES	**665**

Table 3.3 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.

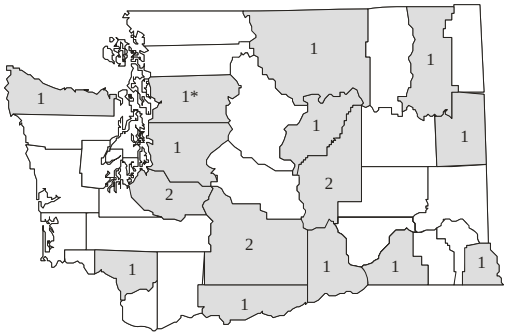
Table 3.3
Solid Waste Facilities in Washington *(as of September 2005)*

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								1		2	2			2
Asotin	1	1	1											1
Benton	1	2				2	2	11		1	4	1		1
Chelan		3			1			5			4			
Clallam	1		1		1			4			2			
Clark			2		2		1	7			2			3
Columbia					1					1	1			1
Cowlitz	1		1		1	1		3			1			1
Douglas	1	1	1					3		1	1			
Ferry								1			1			
Franklin								7		1	1			1
Garfield											1			
Grant	2				1	15		8		3	1			
Grays Harbor		1	1				1	6		3	6			1
Island					1			5			5			4
Jefferson		1	1		2	1		5			1			1
King	1		1		4	2		45			14			5
Kitsap					1	6		5			1			1
Kittitas		1						4			2			2
Klickitat	1			1		2		1			3	1		4
Lewis			1		1	8		3		3	3			1

CONTINUED – Table3.3
Solid Waste Facilities in Washington *(as of September 2005)*

County	MSW Landfill	Inert Landfill	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 Facilities
Lincoln										1	1			1
Mason			1		2	3		14			1			1
Okanogan	1							3			2			1
Pacific								1			2			1
Pend Oreille											3		1	1
Pierce	2	3			4	1	13	38			14		1	1
San Juan						1		1			2			1
Skagit		1			5			8			3			1
Skamania								1			3			
Snohomish		1			5	6		22			5			1
Spokane	1	6	2		1		1	35		1	5		2	3
Stevens	1		1				1	2			4			1
Thurston					2	3		9			1			1
Wahkiakum						1		1						
Walla Walla	1	1			3		1	3						1
Whatcom		1	1		2	6	1	22			4			2
Whitman		4	1		1			3			1			1
Yakima	2	2	2		1	5	2	12		1				3
Total	**18***	**29**	**10**	**1**	**42**	**63**	**23**	**299**	**0**	**18**	**107**	**2**	**4**	**50**

Municipal Solid Waste Landfills



Requirements for municipal solid waste (MSW) landfills are found in chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*. These requirements have not changed.

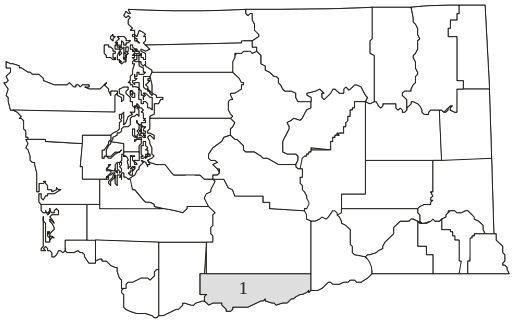
In 2003, 17 operating MSW landfills accepted 5,506,112 tons of waste.
(See Chapter VI for additional discussion of waste types, amounts and sources.)

In 2005, of the remaining 16 operating landfills, the majority, 81%, are operated by public entities. This has historically been true in Washington. However, while privately owned landfills comprise only 19% of the facility type, they have over 90% of the remaining capacity.

Location and Number of MSW Landfills

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

Ash Monofills



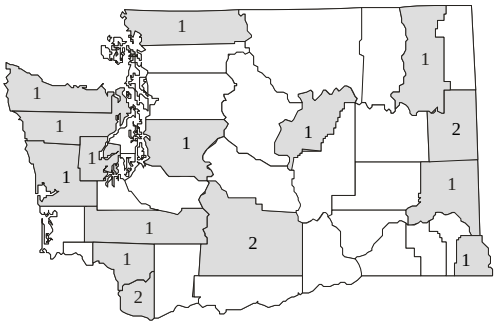
Ash monofills are landfill units that receive ash residue generated by municipal solid waste incinerator/energy-recovery facilities. The *Incinerator Ash Reside Act*, chapter 70.138 RCW, gave direct permitting authority to Ecology, as well as giving the department the authority to develop rules to regulate the disposal of this ash. Under chapter 173-306 WAC, *Special Incinerator Ash Management Standards,* incinerators which burn more the 12 tons per day of municipal solid waste are required to 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 to be used for ash disposal.

In 2005, 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 83,875 tons of special incinerator ash in 2004.

Location and Number of Ash Monofills

Klickitat - 1

Limited Purpose Landfills



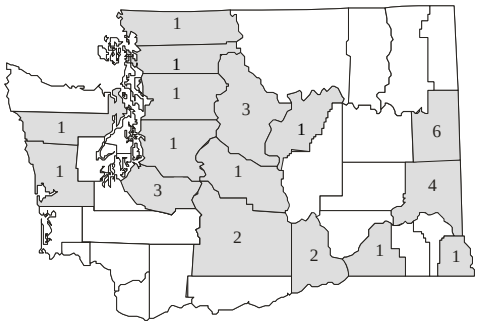
Limited purpose landfills previously regulated under the *MFS,* are now regulated under *WAC 173-350-400, Limited Purpose Landfills*. Limited purpose landfills are defined as a landfill which is not regulated or permitted by other state or federal environmental regulations that receives solid wastes limited by type or source. Requirements for these types of landfills have been increased, including additional design, ground water monitoring and financial assurance requirements.

In 2004, seventeen limited purpose landfills reported receiving 1,075,102 tons of waste.

Location and Number of Limited Purpose Landfills

Asotin – 1	Grays Harbor – 1	Spokane – 2
Clallam – 1	Jefferson – 1	Stevens – 1
Clark – 2	King – 1	Whatcom – 1
Cowlitz – 1	Lewis – 1	Whitman – 1
Douglas – 1	Mason – 1	Yakima – 2

Inert Waste Landfills



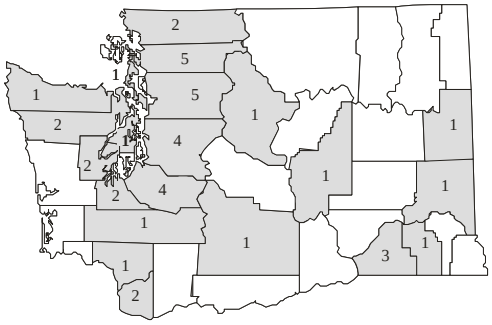
A combined inert/demolition waste landfill, which was previously regulated under the *MFS,* is now broken out under two different portions of the *Solid Waste Handling Standards*. A landfill that takes demolition waste will now need to meet the requirements of *WAC 173-350-400, Limited Purpose Landfills*. 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 2004, 29 inert landfills reported receiving 509,927 tons of waste. In 2005, there were 33 inert/demolition landfills listed in the state.

Location and Number of Inert Waste Landfills

Asotin – 1	King – 1	Spokane – 6
Benton – 2	Kittitas – 1	Walla Walla - 1
Chelan – 3	Pierce – 3	Whatcom – 1
Douglas – 1	Skagit – 1	Whitman – 4
Grays Harbor – 1	Snohomish – 1	Yakima – 2
Jefferson – 1		

Composting Facilities



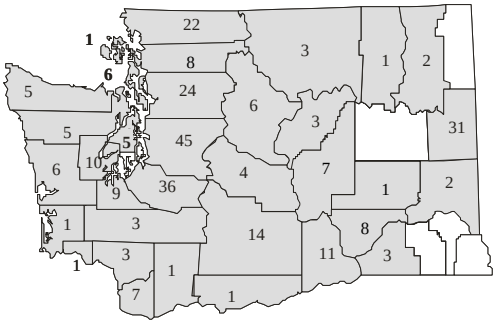
Composting facilities were previously permitted under the *MFS* as either a Pile or a Recycling Facility. Composting facilities will now need to meet the requirements of *WAC 173-350-220, Composting Facilities*. This section of the rule does allow for some specific exemptions from permitting (WAC 173-350-220(1)(b)). Permitted facilities have additional design, operational and compost quality testing requirements.

In 2004, 30 composting facilities reported 682,789 tons of composted material produced. In 2005, there were 39 permitted composting facilities and three exempt facilities identified statewide.

Location and Number of Composting Facilities

Chelan – 1	Jefferson – 2	Snohomish – 5
Clallam – 1	King – 4	Spokane – 1
Clark – 2	Kitsap – 1	Thurston – 2
Columbia – 1	Lewis – 1	Walla Walla – 3
Cowlitz – 1	Mason – 2	Whatcom – 2
Grant – 1	Pierce – 4	Whitman – 1
Island – 1	Skagit – 5	Yakima – 1

Recycling Facilities



In the past, the recycling facility requirements under the *MFS* included land application and composting. These two facility activities fall under their own sections of the *Solid Waste Handling Standards*.

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 "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.

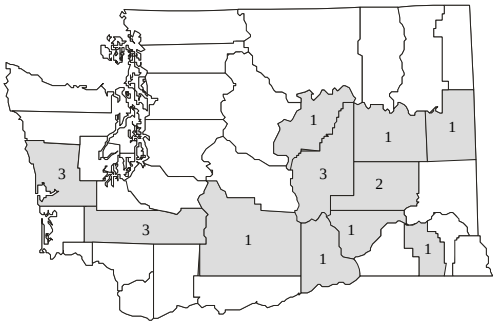
In 2005, there were 134 exempt recycling processors, 128 exempt intermediate recycling facilities and 37 permitted intermediate recycling facilities identified.

Location and Number of Recycling Facilities

Adams – 1
Benton – 11
Chelan – 6
Clallam – 5
Clark – 7
Cowlitz – 3
Douglas – 3
Ferry – 1
Franklin – 8
Grant – 7
Grays Harbor – 6
Island – 6
Jefferson – 5
King – 45
Kitsap – 5
Kittitas – 4
Klickitat – 1
Lewis – 3
Mason – 10
Okanogan – 3
Pacific – 1
Pierce – 36
San Juan – 1
Skamania – 1
Skagit – 8
Snohomish – 24
Spokane – 31
Stevens – 2
Thurston – 9
Wahkiakum – 1
Walla Walla – 3
Whatcom – 22
Whitman – 2
Yakima – 14

Land Application

Under the *MFS*, utilization of solid waste on the land (land application) was permitted as a recycling facility. Currently, *WAC 173-350-230 Land Application* requires a permit for solid waste that is beneficially used on the land for its agronomic value, 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*.

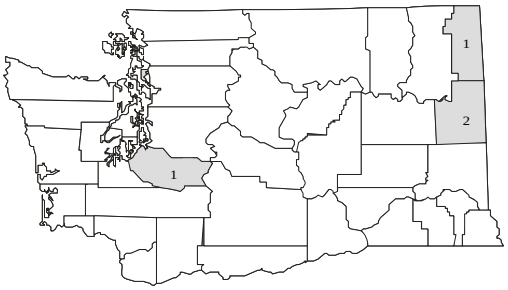


In 2005, 18 land application sites were identified.

Location and Number of Land Applications

Adams – 2	Franklin – 1	Lincoln – 1
Benton – 1	Grant – 3	Spokane – 1
Columbia – 1	Grays Harbor – 3	Yakima – 1
Douglas – 1	Lewis – 3	

Energy Recovery and Incineration Facilities



Energy recovery and incineration facilities that were designed to burn more than twelve tons of solid waste per day were permitted under the *MFS*. These facilities are now permitted under *WAC 173-350-240, Energy Recovery and Incineration Facilities*. The requirements are essential unchanged.

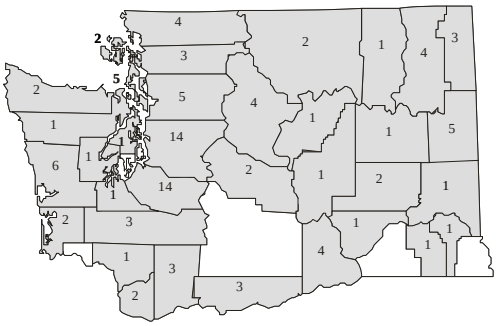
In addition to the solid waste handling permit, solid waste incinerators may be subject to regulations under *chapter 70.138 RCW, the Incinerator Ash Residue Act*. The rule implementing this, *chapter 173-306 WAC, Special Incinerator Ash Management Standards*, require certain solid waste incinerators to prepare generator (ash) management plans. The rule does not apply to the operation of incineration or energy recovery facilities that burn only tires, woodwaste, 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 per day.

In 2005, four energy recovery or incineration facilities were identified statewide. They reported 327,837 tons of waste incinerated in 2004. Of the four 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*. It is required to 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. At this time the City of Tacoma Steam Plant is inactive.

Location and Number of Energy Recovery and Incineration Facilities

Pend Oreille – 1	Pierce – 1	Spokane - 2

Intermediate Solid Waste Handling Facilities



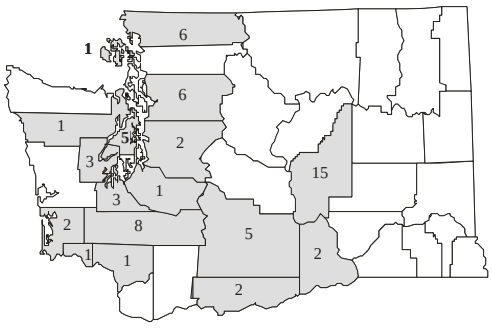
Transfer stations, drop boxes, and baling and compaction sites were permitted under the *MFS*. Material recovery facilities were permitted as recycling facilities under the *MFS*. These facilities are now all permitted under *WAC 173-350-310 Intermediate Solid Waste Handling Facilities*. Some material 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 2005, there were 107 transfer stations identified statewide.

Location and Number of Transfer Stations

Adams – 2	Grays Harbor – 6	Pend Oreille – 3
Benton – 4	Island – 5	Pierce – 14
Chelan – 4	Jefferson – 1	San Juan – 2
Clallam – 2	King – 14	Skagit – 3
Clark – 2	Kitsap – 1	Skamania – 3
Columbia – 1	Kittitas – 2	Snohomish – 5
Cowlitz – 1	Klickitat – 3	Spokane – 5
Douglas – 1	Lewis – 3	Stevens – 4
Ferry – 1	Lincoln – 1	Thurston – 1
Franklin – 1	Mason – 1	Whatcom – 4
Garfield – 1	Okanogan – 2	Whitman – 1
Grant – 1	Pacific – 2	

In 2005, there were 63 drop boxes identified statewide.

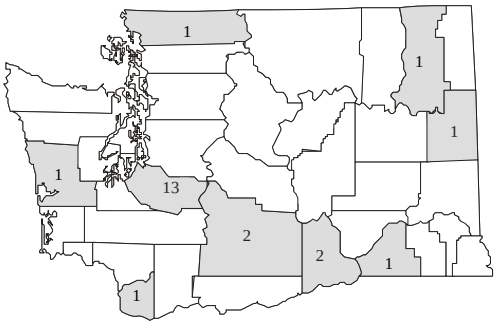


Location and Number of Drop Boxes

Benton – 2	Lewis – 8	Snohomish – 6
Cowlitz – 1	Mason – 3	Thurston – 3
Grant – 15	Pacific – 2	Wahkiakum – 1
King – 2	Pierce – 1	Whatcom – 6
Kitsap5	San Juan – 1	Yakima – 5
Klickitat – 2		

In 2004, there were no separately permitted baling stations identified statewide. There were three publicly owned compacting facilities identified.

Piles Used for Storage or Treatment



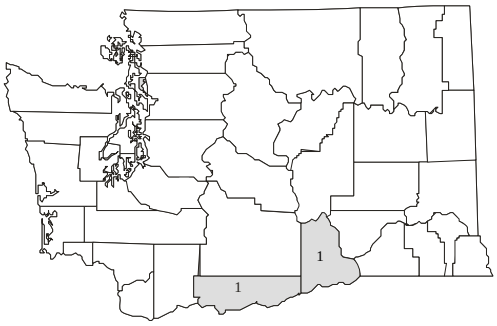
Piles used for storage or treatment under the *MFS* included composting, contaminated soils treatment, as well as tire piles with more than 800 tires at one facility. Composting is now addressed under *WAC 173-350-220 Composting Facilities*; waste tire storage sites with more than 800 tires are addressed under *WAC 173-350-350 Waste Tire Storage and Transportation*. Standards for other types of solid waste piles are found in *WAC 173-350-320 Piles Used for Storage or Treatment*.

In 2005, 27 regulated piles (not including composting or tires) were identified statewide.

Location and Number of Piles

Benton – 2	Pierce – 13	Walla Walla - 1
Clark – 1	Spokane – 1	Whatcom – 1
Grays Harbor – 1	Stevens – 1	Yakima – 2

Waste Tire Storage and Transportation



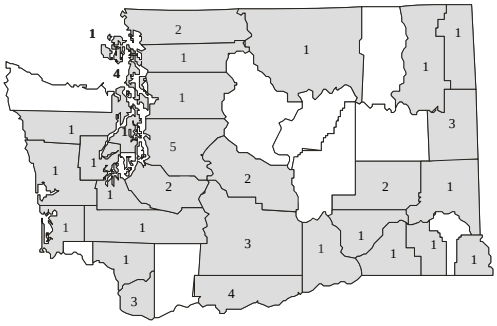
Under the *MFS* waste tire storage facilities with more than 800 tires were regulated under Piles. Waste tire storage facilities of more than 800 tires are now regulated under *WAC 173-350-350 Waste Tire Storage and Transportation*. A significant change in the regulation is the requirement of financial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

In 2005, there were two privately owned permitted tire piles identified.

Location and Number of Permitted Waste Tire Storage Facilities

Benton – 1 Klickitat – 1

Moderate Risk Waste Handling



Moderate risk waste (MRW) facilities were not directly included in the *MFS*, however the Moderate Risk Waste Fixed Facility Guidelines developed by Ecology provided guidance on which aspects of the MFS should be used in the permitting of these interim handling facilities. Now MRW facilities are regulated under *WAC 173-350-360 Moderate Risk Waste Handling*. Mobile systems and collection events and limited MRW facilities and product take-back centers are also addressed in this section of the regulation.

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

In 2005, 50 fixed moderate risk waste facilities were identified 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 Sites

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

Chapter IV
Statewide Litter Prevention & Cleanup Programs

Chapter 70.93 RCW, *the Waste Reduction, Recycling, and Model Litter Control Act*, places Ecology in the leadership role of managing statewide litter programs. Work in 2005 focused on finishing up the statewide litter survey, producing a video about "securing your load," assessing the past three years of the "litter and it will hurt" campaign, and maintaining levels of litter pickup. The Solid Waste & Financial Assistance Program (SW&FAP) implements the following core elements of the statewide litter program:

- Facilitating communication and coordination of litter control and prevention activities;
- Implementing the litter prevention campaign;
- Conducting periodic statewide litter surveys;
- Administering allocations from the Litter Account;
- Deploying the Ecology Youth Corps (EYC);
- Administering the Community Litter Cleanup Program (CLCP); and
- Strengthening partnerships with other state agencies and local government.

Ecology Repeats Statewide Litter Survey

In the fall of 2003, the Solid Waste and Financial Assistance Program (SW&FAP) began the next in a series of litter generation and composition studies across the state. Baseline data was established in the initial study of 1998-1999 (see the litter survey report[3] for a full description of methodology and results). Ecology replicated the methodology used in the 1998-1999 study, but in the interest of time and resources, the 2003-2004 study limited the number of areas that were sampled to road sites only (the previous study included park and recreation areas as well as rest areas). Where feasible, interstate, state route, county road and highway interchange sites from the previous study were used again and there were also several new sites randomly selected.

The Ecology Youth Corps (EYC) median crews, assisted by correctional crews and Washington State Department of Transportation (WSDOT) personnel, gave the 116 survey sites a meticulous initial cleaning in fall 2003. Approximately five months later, in April and May 2004, the same crews took the *first sample.* The samples of litter from each site were bagged, labeled, and stored until a sorting crew from Sky Valley Associates sorted and weighed the samples. The process was repeated in September and October of 2004, with crews collecting the *second sample*. Again the sorting crew sorted and weighed the samples. Results from both samplings were compiled and analyzed by Cascadia Consulting Group, with a final report issued in March 2005 (see the litter survey report[4] for more details).

[3] http://www.ecy.wa.gov/biblio/0007023.html
[4] http://www.ecy.wa.gov/biblio/0507029.html

In addition to taking a snapshot of litter generation and composition, the 2003- 2004 results were compared to the 1998 - 1999 results. Between the two studies there was a 24 percent observed decline in litter, from 8,322 tons in 1999 to 6,315 tons in 2004. While encouraging, this finding is not necessarily statistically significant. Ecology will have to wait until the 2008- 2009 study to see if there is indeed a downward trend in litter generation. Table 4.1 shows some of the observed differences between the 1999 and 2004 results in litter generation and selected components.

Table 4.1
1999 and 2004 Litter Survey Results

	1999 Tons	2004 Tons
Generation		
Total Litter Generation - Roads	8,322	6,315
Total Litter Generation - Interchanges	617	443
Composition*		
All Beverage Containers	2,114	991
Glass Beverage Containers	1,698	775
Fast Food Packaging	263	170
Construction & Demolition Debris	1,283	830
Tires & Rubber Auto Parts	749	447
Cigarettes/Tobacco	88	130
Food	140	105
Cardboard/newspaper/paper bags	399	348

*Note: Composition results are roads and interchanges combined

Even with the reduction, the new survey estimated that 12.5 million pounds of litter is deposited on interstates, state routes, and county roads each year. Obviously, there is still a lot of work to be done in the areas of litter cleanup and prevention. The litter study results will be used to better target prevention measures, evaluate collection efforts, and assess whether any laws or rules need to be revised.

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 regarding litter. Key elements of the campaign include:

- television, print, and radio media;
- the operation of a litter hotline;

- a roadway and retail signage program;
- a website;
- distribution of litterbags and campaign materials; and
- an enforcement plan.

The "litter and it will hurt" campaign is based on research conducted in 1999 and 2001 that indicated strong messages about littering fines and penalties would be the most effective deterrent to litter. The "litter and it will hurt" slogan premiered in 2002, accompanied by information on current fines associated with littering and facts about the litter problem, to raise public awareness about litter.

The original campaign plan provided Ecology with a three year implementation plan, which concluded at the end of 2004. With limited funding available, Ecology decided to significantly reduce campaign activity in 2005, instead spending time reviewing the litter survey results and planning for the next iteration of the litter prevention campaign.

Secure Your Load

Litter research has estimated that as much as fifty percent of litter comes from unsecured loads as opposed to someone deliberately tossing trash. Road debris poses a significant hazard to motorists. A report from the AAA Foundation estimates that road litter causes 25,000 accidents every year, nearly 100 of them fatal. The reality of these statistics was brought to light in 2004 when Renton-woman Maria Federici, was nearly killed when a piece of particle board fell from the back of a trailer and smashed through her windshield, critically injuring her.

As a result of this accident, the 2005 Legislative session passed Substitute House Bill 1478, which was signed into law by Governor Christine Gregoire and became effective July 2005. The legislation changed the litter laws and raised the price of a ticket for an unsecured load.

As before, failure to secure a load is a traffic violation and carries a $194 fine. The bill created two additional categories of unsecured loads. Failure to secure a load and causing bodily injury is a gross misdemeanor and can carry a fine up to $5,000 and/or up to one year's jail time. Failure to secure a load in cases involving property damage is a misdemeanor and can carry fines up to $1,000 and/or up to 90 days' jail time.

There were two significant campaign activities in 2005, both focusing on the dangers posed by litter and other road debris from unsecured loads in/on cars and trucks; the creation of educational videos and a litter law enforcement project.

Creation of Educational Videos

Maria's accident received a great deal of media attention, raising awareness of the issue and need to "secure loads." In response, Ecology worked with Washington State Patrol, Washington Department of Transportation, and the Maria Federici Foundation to produce an educational video focusing on the secured load issue and litter laws in general. The result was two 10-minute videos. The first is specifically intended for the law enforcement community, reminding them of

why enforcing litter laws is so important and reminding them of the fines and citations. The second video was produced for a more general audience and recounts the story of Maria's accident and that of a Department of Transportation worker who was nearly killed when he was caught in a roadside fire caused by a tossed lit cigarette butt. In addition to information about the state's litter law and fines, it also includes tips for properly securing loads. The "public" version of the video[5] can be viewed on Ecology's website.

Litter Enforcement Project

The campaign has always had an enforcement theme, but to date, there has not been a concerted effort to raise enforcement levels. Research has shown that media attention about enforcement often has as much or more of an impact than actual enforcement because more people become aware of the penalties. Media coverage of accidents caused by road debris and unsecured loads brought increased attention to the issue. With this media momentum on our side, Ecology conducted a litter enforcement pilot project in June 2005 to further the objectives of the campaign.

Ecology surveyed law enforcement personnel to get their ideas on how to increase enforcement levels. Raising awareness of why enforcement is important was their number one recommendation. The first step was producing the "secure your load" video which was distributed to Washington State Patrol offices statewide. The video is designed to appeal to troopers' sense of duty to safeguard motorists as well as to serve as a reminder to them of what the laws, fines and citations are.

To increase the number of tickets written, Ecology decided to conduct a pilot project modeled after Washington Traffic Safety Commission's "Click it or ticket" campaign. Snohomish County was selected for its proximity to the Seattle media market and the interest in participation by the law enforcement community and the county. Ecology offered over-time dollars to law enforcement personnel to write tickets for litter and unsecured load violations during June 2005. Additionally, personnel at county transfer stations were given educational brochures to distribute to all customers.

Washington State Patrol, Snohomish County Sheriff and the Everett Police Department all participated in the enforcement patrols. Snohomish County Solid Waste staff assisted by educating the public visiting county-run transfer stations and organizing a press event. Ecology provided "secure your load" brochures and litterbags for distribution, and purchased radio air time for announcements during traffic reports.

A news conference was held at a county-run transfer station and the project received excellent media coverage, with a 5-minute story on KOMO News. Early in the project, officers reported that they just weren't seeing many people litter, so they shifted to educating motorists of litter laws during every stop. In 183 hours of patrolling, officers only wrote 22 litter tickets, but made over 400 "educational" contacts. Officers convinced Ecology that these contacts are extremely effective because in addition to being memorable to the person who was stopped, that person is likely to share their experience with friends and relatives. In the final project review, everyone

[5] http://www.ecy.wa.gov/programs/swfa/litter/

who participated agreed that it was definitely worthwhile and encouraged Ecology to conduct similar projects in the future.

Other Campaign Components

Media

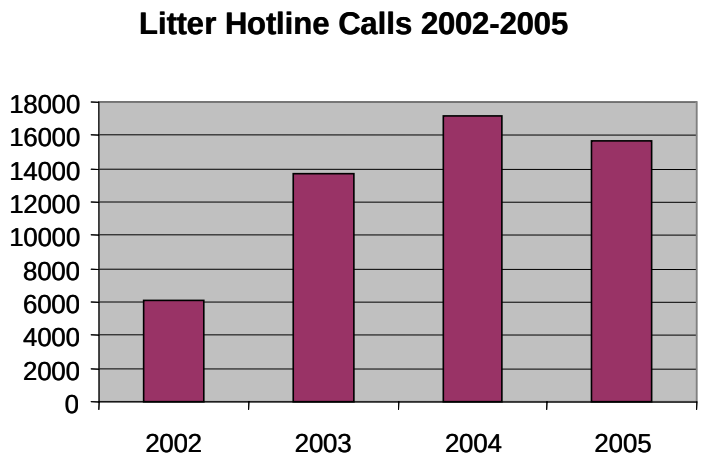
Ecology did not create any new television or radio in 2005, nor did we place any media buys using previously produced spots. No billboards were produced and no new road signs were posted on the interstates, but several counties decided to put the campaign road sign on county roads.

Litter Hotline

The one constant throughout the campaign has been the 24-hour litter hotline. This cooperative venture between Ecology, the Washington State Patrol, and the Department of Licensing (DOL) allows citizens to dial **1-866-LITTER-1** and report the location and license plate number of vehicles whose occupants are seen littering. While tickets cannot be issued based on caller hearsay, Ecology staff cross-reference the plate number on a DOL database. The registered owner is sent a letter from the Washington State Patrol, informing them of the fines they could face if caught littering. A litterbag is also enclosed for their use.

The hotline provides a unique opportunity to communicate one-on-one with a potential litterer. Unlike a television commercial or road sign which may or may not be seen, a letter mailed directly to an individual sends a strong message that littering is not acceptable and asks that they do their part to keep Washington clean. Research has led Ecology to believe this is an effective strategy. As shown in Figure 4.1, call volume decreased slightly in 2005, perhaps due to the lack of television or radio advertising.

Figure 4.1
Litter Hotline Calls



Litter Program Fund Allocation

Significant portions of the Waste Reduction, Recycling and Model Litter Control Account (WRRMLCA) support litter and illegal dump cleanup on public roads and lands through a variety of programs. The legislation (Chapter 70.93 RCW) directs fund allocation as follows:

- 20% to run the Community Litter Cleanup Program (CLCP),
- 30% to fund waste reduction and recycling efforts within Ecology, and
- 50% to fund litter clean-up efforts.

Besides providing monies for the Ecology Youth Corps (EYC), the 50% dedicated to clean-up efforts also pays for litter activities carried out by other state agencies. Funding for the litter prevention campaign comes from the fifty percent as well.

For last biennium (July 2003 – June 2005), the appropriation from the WRRMLCA was $12.66 million divided as follows:

➢ Community Litter Cleanup Program (20%)	$2.76 million
➢ Waste Reduction & Recycling Activities (30%)	$3.69 million
➢ Litter Cleanup & Prevention (50%)	$6.21 million
TOTAL	**$12.66 million**

For the new biennium (July 2005 – June 2007), the appropriation from the WRRMLCA was $13.88 million divided as follows:

➢ Community Litter Cleanup Program (20%)	$2.85 million
➢ Waste Reduction & Recycling Activities (30%)	$4.49 million
➢ Litter Cleanup & Prevention (50%)	$6.54 million
TOTAL	**$13.88 million**

The $6.54 million dedicated to clean-up efforts and prevention was allocated as follows:

➢ Operation of Ecology Youth Corps	$2.64 million
➢ Other state agencies	$1.06 million
➢ Prevention campaign/litter survey	$1.03 million
➢ Agency overhead	$0.36 million
➢ Administration & coordination (staff)	$1.45 million
TOTAL	**$6.54 million**

Ecology Youth Corps

2005 marked the 30th year of operation for the Ecology Youth Corps (EYC). The Ecology Youth Corps[6] website contains regional hiring information, applications, and photos of the corps in action.

Background:
RCW 70.93.020 requires creation of "...jobs for employment of youth in litter cleanup and

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

related activities." The EYC operates two types of crews, youth crews and median crews. Youth crews operate in the summer months (June-August) and comprise the largest portion of EYC activities. 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 old youths who principally 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 who clean challenging areas of roadways, including medians, complex ramps and interchanges, and exceptionally high-traffic areas.

During fiscal year 2005 (July 2004 – June 2005), median crew efforts were split between the state's litter survey and routine work. In the fall of 2004, crews revisited each litter survey site to gather the final sample for analysis. When work resumed in the spring of 2005, crews focused on their routine work assignments (for more information on the litter survey, please see the section earlier in this report).

EYC crews collected litter on roadways and or public land in the following counties:

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

Eastern Region (ERO):
Adams, Asotin, Ferry, Franklin, Columbia, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman

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

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

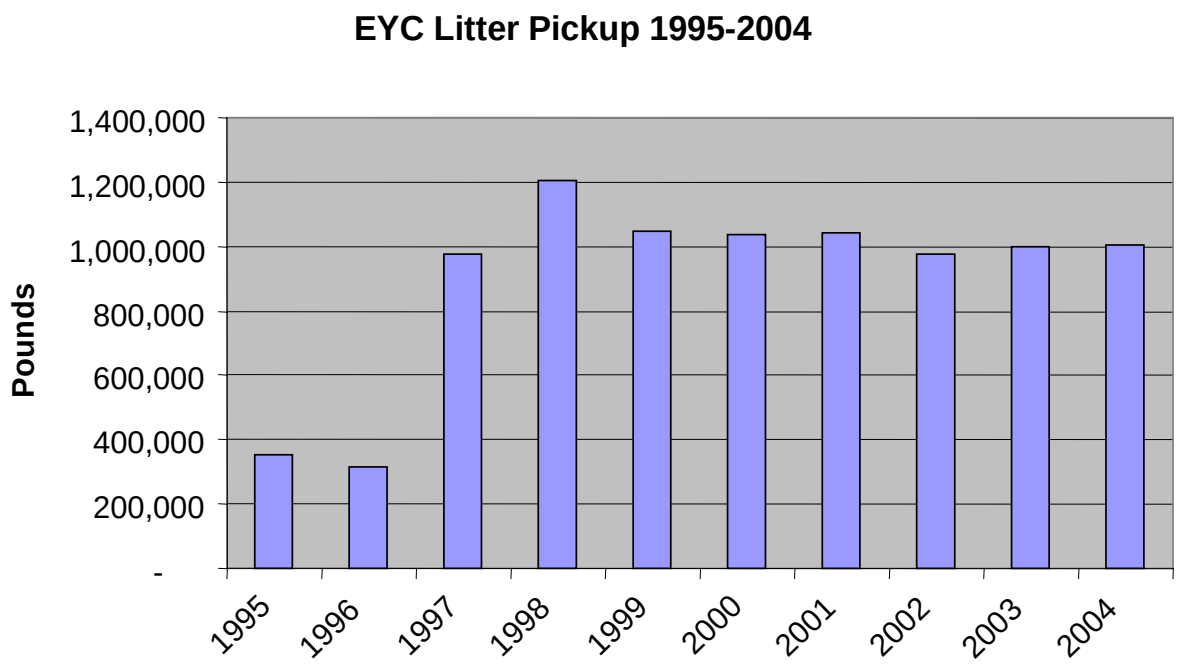
During fiscal year 2005, EYC crews were responsible for the following outputs, which included some litter survey work:

- 75,762 hours worked
- 1,039,481 pounds (520 tons) collected
- 4,604 miles cleaned
- 540 acres cleaned
- 64 illegal dumps cleaned

EYC also ensures that youth learn about the broader issues of waste reduction, recycling, litter abatement, 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, or a local organic farm as part of their work experience. Figure 4.2 shows the amount of litter EYC has picked up over that last 10 years.

Figure 4.2
Historic Ecology Youth Corp (EYC) Litter Pickup



Community Litter Cleanup Program

The Community Litter Cleanup Program (CLCP) was developed and implemented in 1998 with the goal of providing financial and technical help to local governments with the growing problems of litter and illegal dumps. Now on a biennial cycle, the CLCP continues to be a key element of statewide litter-cleanup programs. The CLCP program cycles are listed in Table 4.2.

Table 4.2
CLCP Program Cycles

Cycle	Months of Cycle
1st Cycle	April 1998 - December 1998
2nd Cycle	January – December 1999
3rd Cycle	January 2000 – June 2001
4th Cycle	July 2001 – June 2003
5th Cycle	July 2003 – June 2005
6th Cycle	July 2005 – June 2007

A majority of jurisdictions use jail or community service crews to accomplish litter cleanup work. The use of offender crews provides significant savings to local jails and returns labor value to participating communities. In addition to cleaning up litter and illegal dumps and putting offenders to work, the program involves individuals and businesses at the local level, building a sense of stewardship.

During the fifth cycle, a major change in how CLCP funds were allocated was initiated. In the past, each jurisdiction was eligible to receive the same amount of funding. This meant that small, unpopulated counties received the same dollar amount as large populated ones. Using recipient input, Ecology developed a formula for determining how CLCP funding could be more fairly distributed. The factors used in this formula include population, road miles, vehicle miles driven (a measure of traffic), geographic size (acreage), and more subjective criteria such as past performance. Ecology also set a base amount, so no jurisdiction would be left out. Many believe the new allocation system is more equitable and it was used to allocate funds in the sixth cycle as well.

In the fifth cycle, $2.76 million was awarded to 41 entities, with all eligible jurisdictions participating. The $2.76 million includes $186,000 that in previous biennia went directly to Department of Corrections (DOC). In two jurisdictions (City of Seattle and Kittitas County), money that previously went to DOC was incorporated into the CLCP contract to create efficiencies. A report produced in September of 2005 indicated that 95% of CLCP funds had been disbursed to date; the highest percentage since the program's inception. Table 4.3 highlights the work accomplished during the entire fourth and fifth cycle.

Table 4.3
Statistics from the Community Litter Program
July 2001 – June 2005

	July '01-June '03	July '03-June '05
Volunteer Hours	49,815	37,848
Correctional Crew Hours	286,007	266,130
Supervisor Hours	78,907	78,676
TOTAL HOURS	**414,729**	**382,654**
Road Miles Cleaned	69,189	54,777
Acres Cleaned	38,184	12,726
Number of Specific Dump Sites Cleaned Up	6,093	9,485
Pounds of Litter Picked Up	4,724,110	4,277,797
Pounds of Illegally Dumped Materials Picked Up	3,419,227	3,528,504
Pounds of Material Recycled	1,020,256	775,953
TOTAL POUNDS	**9,163,593**	**8,582,254**

Litter Cleanup by Other State Agencies

The state agency litter workgroup continues to function, meeting once or twice a year to review activities, improve coordination, and discuss future funding. The workgroup is comprised of representatives from the departments of Corrections, Natural Resources, Transportation, the Parks and Recreation Commission, and Ecology.

In the summer of 2005, the Washington State Department of Fish & Wildlife (DFW) approached Ecology, seeking funds to assist in their efforts to clean illegal dumps and litter from state lands. Not wanting to reallocate state agency funding that was already committed, Ecology agreed to fund a pilot project with DFW for the 06/07 biennium. With the execution of the interagency agreement, DFW officially becomes part of the state agency workgroup for litter control and prevention.

Using a consensus process, the workgroup negotiates the amount each agency receives through interagency agreements to fund litter activities. The budgets for the past two biennia as well as the current biennium are listed in Table 4.4 below. Excluding the supplemental budget in 2003, funding to other state agencies has remained fairly constant.

Table 4.4
Interagency Agreements between Ecology and
Other State Agencies for Litter Activities
July 1, 1999 – June 30, 2007

Agency	FY00/01	FY02/03	FY04/05	FY06/07
Dept. of Corrections	$492,000	$466,000	$452,000	$450,000
Dept. of Natural Resources	$497,000	$468,000	$457,000	$455,000
Dept. of Natural Resources (supplemental)	n/a	$500,000	n/a	n/a
Dept. of Transportation	$78,000	$70,000	$72,000	$80,000
Parks & Recreation	$30,000	$26,000	$49,000	$50,000
Fish & Wildlife	$0	$0	$0	$25,000
TOTAL	**$1,097,000**	**$1,530,000**	**$1,030,000**	**$1,060,000**

Parks and Recreation Commission

The Parks and Recreation Commission (Parks) traditionally uses litter funds for waste reduction and recycling efforts as well as litter control. Most litter collection is done by park rangers, park users, and volunteers. Park's Litter and Recycling Program leads the agency in sustainability goals and has been linked to Park's Centennial 2013 Vision and Goals. For the FY04/05 agreement, Ecology provided Parks with $49,000 which was allocated as follows:

- 52% for litter and illegal dump cleanups:
  28 illegal dump sites were removed from 14 parks, totaling 226,016 pounds of

material removed. An additional 60,820 pounds of litter were removed as part of Operation Shore Patrol.

- 28% for recycling programs:
  60% of parks provide recycling opportunities for park visitors. Over the last biennium, eleven parks added new recycling containers and more parks adopted consistent recycling signage. Fields Spring State Park, in Asotin County purchased bear-proof recycling containers as a pilot project.
- 10% in support of volunteer litter pickup programs:
  The Litter Program purchased 480 litter-grabbers for volunteer use and 2,780 large litterbags were provided for Spokane's Centennial Trail clean-up day. Additionally, 101,100 car litterbags were distributed.
- 8% in support of a pet waste disposal program:
  25 new parks joined the program in 2005, bringing the total to 70 pet waste bag dispensers used in 34 parks. 60,000 biodegradable plastic bags were also purchased.
- 2% for a composting program:
  The cafeteria at Fort Worden State Park, which feeds thousands of people each month, composts all food waste.

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. The FY04/05 interagency agreement with DOC provided $266,000 to crews in Wenatchee, Spokane, Tri-Cities, Walla Walla, and Yakima. In the past, the Seattle and Ellensburg DOC crews had contracts with Ecology as well as the respective local CLCP organization. As a pilot project, the remaining $186,000 of DOC's allocation for these crews was distributed as part of the Community Litter Cleanup Program. This funding arrangement was continued in the current biennium. For more information please refer to the "Community Litter Cleanup Program" section of this report.

Table 4.5 summarizes activity of DOC crews covered by the interagency agreement (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
July 1999 – June 2005

	FY00	FY01	FY02	FY03	FY04	FY05
Hours of Work (supervisor and offender)	50,719	45,546	44,086	43,014	24,633	28,191
Pounds of Litter & Illegally Dumped Materials Removed	813,578	908,892	682,029	880,105	287,494	360,120
# of illegal dump sites cleaned	345	571	406	831	12	6
Miles of road cleaned	7,641	5,059	2,969	2,714	1,230	1,333
Acres cleaned	2,203	2,394	1,463	2,257	1,182	992

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 continues to have a considerable impact on the cleanup of litter and illegally dumped materials in state-owned forests.

The FY04/05 interagency agreement between Ecology and Department of Natural Resources (DNR) provided $402,000 for part-time crews at the following camps: Naselle, Larch, Cedar Creek, Monroe, Olympic, Airway Heights and the Washington Correction Center for Women. An additional $55,000 was devoted to contracted and volunteer crew activities.

Table 4.6
Department of Natural Resources Litter Removal Activity
July 1999 – June 2005

	FY00	FY01	FY02	FY03	FY04	FY05
Hours of Work (supervisor and offender)	22,114	33,493	41,992	53,477	19,030	30,208
Pounds of Illegally Dumped Materials Removed	296,719	542,276	720,610	2,280,949	293,277	581,562
# of illegal dump sites cleaned	174	535	519	758	373	564
Miles of road cleaned	1,282	3,269	2,128	1,752	839	1,019
Acres cleaned	161	122	107	389	125	146

Department of Transportation

The Department of Transportation (WSDOT) is responsible for picking up litter along state roads including the bags of litter collected by their Adopt-a-Highway groups as well as Ecology Youth Corps, and Department of Corrections. The FY04/05 interagency agreement between Ecology and Transportation provided funding ($72,000) to offset the costs of disposal. Table 4.7 summarizes the litter work accomplished by Transportation crews.

Table 4.7
Department of Transportation Litter Removal Activity
July 1999 – June 2005

Time Period	Amount of Litter Disposed (Cubic Yards)
FY00	10,349
FY01	19,738
FY02	13,757
FY03	21,607
FY04	26,793
FY05	35,143
Total	**127,387**

Data provided by WSDOT

In response to Governor Locke's 2003 directive to make staff cuts, Ecology management cut the Ecology Youth Corps Supervisor positions at the end of the 2003 season. Recognizing the valuable service provided by the EYC Program, Ecology management further directed SW&FAP to explore options to keep the program operating.

Washington State Department of Transportation agreed to assume the supervisor positions, for a one season trial in 2004, which was extended through 2005. The interagency agreement between Ecology and WSDOT, stipulates that Ecology retain responsibility for funding and program oversight and implementation, while WSDOT is technically the EYC supervisors' employer.

Looking Ahead

Since launching the "litter and it will hurt" campaign in the spring of 2002, Ecology has tracked several indicators that suggest the state is on the right path to reducing roadway litter: the litter survey report; Washington State Department of Transportation data evaluating road "cleanliness;" and telephone surveys that track campaign awareness

Litter and illegal dump clean-up numbers have held fairly steady, parallel to funding available for those activities. Cleanup programs will have to be monitored to make sure dollars are put towards the most efficient and effective programs.

The litter campaign contract with the consultant team of Sharp Hartwig Inc. expired in June 2005. Late in 2005, SW&FAP issued a request for proposal to conduct evaluation and re-planning efforts for the "litter and it will hurt" campaign. The selected firm will conduct a thorough review of campaign activities to date to evaluate what worked and what did not work. They will conduct research to make sure enforcement themed messages are still pertinent and to assess whether it is time to shift target audiences. Finally, they will produce a new plan to guide litter prevention efforts for the next three years.

Chapter V
Measuring Recycling and Diversion

In 1989, the Legislature, in amending the *Solid Waste Management Act* (chapter 70.95 RCW), set a state recycling goal of 50%, to be achieved by 1995. They also stated that recycling should be made at least as affordable and convenient to citizens as garbage disposal.

In response, local governments began putting in place various forms of recycling ranging from drop boxes to curbside collection of a variety of recyclable materials. In 2004, there were 164 cities and county unincorporated areas offering curbside collection of recyclable materials such as glass, paper, and metals while 122 of those cities and county unincorporated areas (74% out of those 164) 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 collected by these programs far outweighs what is collected in the residential sector.

Despite all the efforts made by citizens, government, and industry, the 50% goal was not attained by 1995, and in 2002, the Legislature amended the state goal to be achieved by 2007. They also set a state goal to establish programs to eliminate yard waste in landfills by 2012. With these goals in mind, as well as the statewide solid waste plan's vision of leading us *Beyond Waste*, we must reaffirm our commitment to an accurate measure of our performance in the area of recycling and waste reduction.

In 1999, the Solid Waste & Financial Assistance Program (SW&FAP) began to expand its measurement to include materials that are diverted from the waste stream but are considered outside of the state's definition of municipal recycling. This expanded measure of waste diversion includes non-MSW recyclables such as construction and demolition debris, materials that are burned for energy recovery, and reused materials. For 2004, the diversion rate was 48%. (See Table 5.1.)[7]

Table 5.1
Recycling and Diversion Rates
1986 to 2004

Year	Recycling Rate	Diversion Rate[1]
1986	15%	N/A
1988	28%	N/A
1989	27%	N/A
1990	34%	N/A
1991	33%	N/A
1992	35%	N/A
1993	38%	N/A
1994	38%	N/A
1995	39%	N/A
1996	38%	N/A
1997	33%	N/A
1998	35%	N/A
1999	33%	28%
2000	35%	37%
2001	37%	41%
2002	35%	45%
2003	38%	47%
2004	42%	48%

The Department of Ecology (Ecology) continues to measure progress in the area of recycling and waste diversion through the annual recycling surveys and annual reports for recycling,

[7] [7] Ecology began measuring the diversion rate in 1999. Please see the section of this chapter entitled "Diversion Rates" for a full explanation of the difference between recycling and diversion rates.

composting, and intermediate solid waste handling facilities or material recovery facilities (MRFs). Ecology is also gearing up for changes in the way recycling and waste diversion are measured, which will take into consideration the state solid waste plan (*Beyond Waste*) and the goals laid out in this plan.

Recycling Rates for MSW

Each year since 1986, Ecology has conducted a survey to measure the statewide recycling rate for municipal solid waste. Information is provided by local governments, haulers, recyclers, brokers and other handlers of materials from the recyclable portion[8] of the waste stream that are collected for recycling.

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

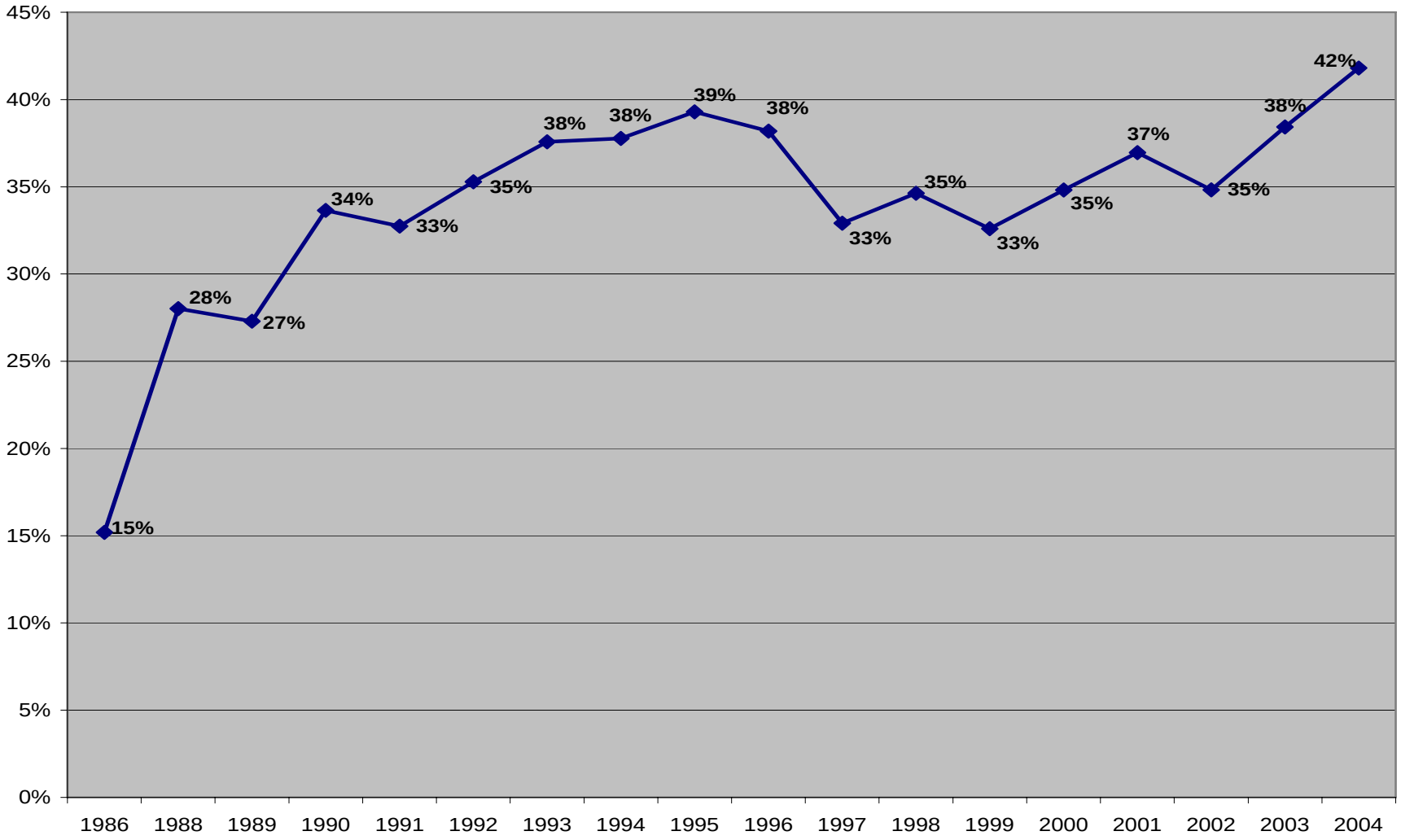
The poor paper and metal market trend continued in 1998, but improved enough to raise Washington's recycling rate to 35%. Although markets improved in 1999, the tonnage disposed of increased enough to drop the recycling rate to 33%. Markets continued to improve in 2000, raising the recycling rate again to 35%. Although markets for most materials fell in 2001, the

[8] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes 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.

increased activity and better reporting for key materials brought the rate to 37%. 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% for 2002.

In 2003, changes were implemented in the reporting requirements for recycling facilities. These changes resulted in better reporting of recyclables since then. Additionally, the market demand for ferrous and nonferrous metals was high during 2003, which aided in bringing the recycling rate up to 38%. In 2004, with the continued strong reporting of recyclables collected along with market increases for metals, paper and yard debris, the rate for MSW recycling jumped to 42%. (See Figure 5.1) The Solid Waste & Financial Assistance Program website provides detailed data on materials recovery since 1986 at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Figure 5.1
Washington State MSW Recycling Rate - 1986 to 2004



A factor influencing the recycling rate is the willingness of recyclers to report their collected tons to Ecology. Up until 2003, under the recycling survey, state law required collectors of recyclable materials to report what they collected; however, neither the law nor the state solid waste regulation identified any penalties for those who did not comply. The regulation was changed when chapter 173-350 WAC, *Solid Waste Handling Standards*, took effect in 2003. This regulation provided a conditional exemption from solid waste permitting for identified recycling facilities and intermediate solid waste handling facilities or MRFs. As one of the conditions for exemption from permitting, the identified facilities are required to submit an annual report to Ecology and their local health department on the type and quantity of recyclables collected. This requirement has helped to increase reporting by recyclers. Any other recyclers that are not identified as exempt under the current solid waste regulation, such as haulers or out of state facilities accepting materials from Washington, are also asked to report their recycling through the annual recycling survey.

As of this writing, 82.9% 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 700 thousand new people since 1995. Ecology believes that newcomers to the state may not participate as much in recycling programs since they were not exposed to the waste reduction and recycling outreach programs run by Ecology and the counties in the early 1990s. Studies also indicate that without continuous education and advertising the recycling message tends to be forgotten.

Frequency of collection (weekly, biweekly) has also been shown to be an important determinant of the amount collected on curbside programs. The City of Seattle attributes a drop in the tons recovered on their curbside programs in 2000 and 2001 partly to the change in collection from weekly to biweekly. As more cities implement less frequent collection on curbside as an efficiency measure, without the corresponding education needed to offset the decline in participation, we could see a decline in tonnage collected on these programs.

Many curbside programs in the state are implementing commingled or single-stream collection systems in an effort to reduce costs and increase collection of recyclables. This trend became more evident in 2003 as new sorting facilities and procedures were put into operation. Some evidence suggests that the convenience of not having to sort recyclables leads to increased participation by residents. In most cases, programs that changed to commingled collection also increased the range of materials collected. Compared to source separated collection programs, the single-stream programs are showing increases of about 10% in the volume of material collected. However, this is producing mixed results where end markets are concerned. Reports from mills are showing that the contamination from these programs can be so great as to reduce the usable amount of material by up to 15%. Ecology, in conjunction with local governments, has outlined the issue in a considerations document entitled "Single Stream Versus Source Separation: Considerations Document for Local Government."[9]

[9] 2004: This document is available by contacting Emma Johnson of Ecology's northwest regional office, at (425) 649-7266, or by e-mail ejoh461@ecy.wa.gov.

Recyclables reported from the commercial sector increased by 18% in 2004.[10] Based on tonnage figures reported by recyclers who provide service to the nonresidential sectors, these programs are highly successful in diverting large volumes of materials away from disposal. Economic incentives are providing the encouragement for businesses to reduce their waste output through recycling and diversion.

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 by the Environmental Protection Agency.[11] However, since the mid-1990s, Ecology has noted very large increases of material recovery in "non-MSW" waste streams; most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and landclearing debris. The recovery of these materials for uses other than landfill disposal is termed “diversion”.

Ecology began tracking diverted materials along with the recycling survey in 1999, and since then is calculating a “diversion” rate alongside of the traditional “MSW recycling” rate. The diversion rate is calculated by measuring materials classified as non-MSW that are diverted from the waste stream along with recyclables that are considered MSW, and then comparing the resulting figure to total waste generation. The total waste generation includes all MSW and non-MSW waste types whether they are disposed of, diverted, or recycled.[12] Washington shows a diversion rate of 48% in 2004. (See Figure 5.2.)

The methodology for measuring these diverted materials is as simple as collecting the number of tons of material that are diverted from landfills as opposed to disposed. Many recycling survey respondents have voluntarily listed this information on the recycling survey in the past, and beginning in 1999 Ecology began asking for it more specifically.

Increasingly, Washington counties and cities have been putting efforts into waste streams outside of the traditional municipal solid waste stream. The best example is for the construction and demolition waste stream. Many of these materials are now being recycled, including asphalt, roofing shingles, concrete, dimensional lumber, various grades of metals, and more. Knowledge of this waste stream is increasing and it is becoming easier to characterize.

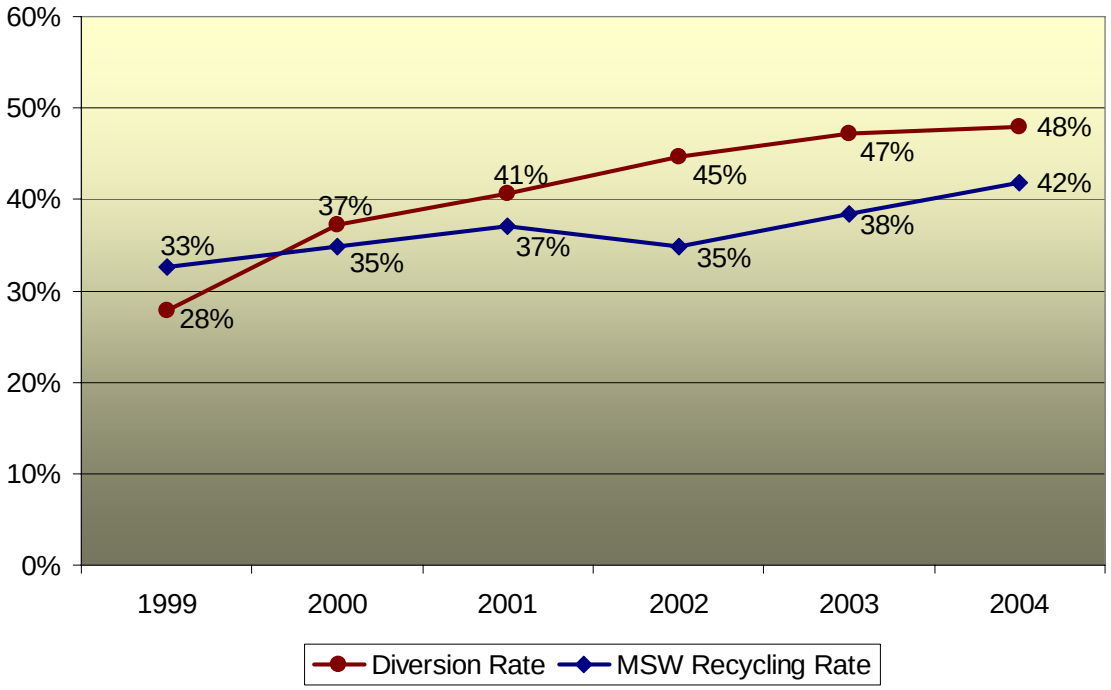
Wood waste is another large waste stream in Washington. A major portion of the recovered wood is eventually burned for energy recovery, and a percentage of it is also being used in new wood and paper products, as a feedstock in composting operations, and as mulch. In 2002, Ecology began to account for the portion of reported recovered wood that is burned and to measure it as a diverted material. Ecology believes that an undetermined amount of

[10] This measure of commercial-sector recycling includes diverted and recycled material types and is based on a commercial/residential breakdown as reported by facilities.
[11] 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.
[12] Waste types used to calculate diversion include municipal, demolition, inert, commercial, wood, tires, medical, and other. Excludes industrial wastes, asbestos, sludge and contaminated soils.

the wood reported as "recycled" is actually destined to be burned for energy recovery or to be 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 even though they do not fit into the category of MSW recycling, they are tracked to show the landfill disposal that has been avoided.

Figure 5.2
Washington State Diversion and MSW Recycling Rates - 1999 to 2004



Materials which require minimal or no processing for reuse, resale, or land application (in the case of organic materials) historically have been excluded from the definition of recycling for purposes of determining the recycling rate. Chapter 173-350 WAC, *Solid Waste Handling Standards*, adopted in 2003, allows waste generators to apply for exemption from solid waste permitting for the use of a waste as a substitute feedstock in a manufacturing or other industrial process or when used as a soil amendment. These activities do not fit into Ecology's current definition of recycling. Therefore, even though they provide a beneficial use over landfill disposal or incineration, or perhaps even over recycling, they will be counted as "diverted" material and thus measured outside of the recycling rate as it is currently defined.

Ecology maintains that the non-MSW sector of the waste stream is not well characterized and there is no definitive information on the total volume of waste generated, especially in the industrial sector. Unless the facility doing the diversion is one that is identified as exempt from permitting under chapter 173-350 WAC, *Solid Waste Handling Standards*, the reporting requirement for solid waste recyclables does not include these activities; therefore,

respondents choose on a voluntary basis to report quantities handled. This makes it difficult to figure a recycling rate for many of these materials because either there is not enough information on the total amount of waste generated or the beneficial use does not meet the state's definition of recycling.[13]

Measurement Methodology

The Legislature requires Ecology to conduct an annual measure of the recycling activity in the state and report the results to the appropriate stakeholders. From 1986 until 2002, the mechanism for quantifying the recycling activity in Washington included only the annual recycling survey. With the changes in the reporting requirements that were put in place with the implementation of chapter 173-350 WAC, *Solid Waste Handling Standards*, the measurement tools now include annual reports for recycling facilities and intermediate solid waste handling facilities or MRFs, along with the annual recycling survey.

Survey and annual reporting forms are sent to recycling facilities, firms, haulers, and local governments to obtain information about types and quantities of recyclable materials collected. Since reporting on the recycling survey portion of the measurement tool is mandatory, but there is no penalty for not returning the information, 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. Aggregate figures for each commodity are developed, which are compared to the results collected.

The recycling survey is essentially voluntary in that there is 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 are asked to report only tonnage collected directly from generators. Facilities responding to annual reports are required to submit tonnage information for all materials handled at their facility. Additionally, county recycling coordinators and solid waste managers are asked to review the figures. Finally, figures are checked against double-counting by verifying exchange of materials between reporting entities.

For the 2004 reporting year, both the recycling survey forms and the annual reporting forms were available on the Internet. Respondents are now able to print and complete the forms manually or to 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 was necessary for some respondents. It also allowed Ecology staff to check the forms and follow up on errors or calculate conversion (pounds to tons, for example) before the data was

[13] Revised Code of Washington 70.95.030 (16) "Recycling" means transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration.

entered into the off-line database. This step provides a crucial quality-control step helping to maintain integrity of the data.

Results – 2004 MSW Recycling and Diversion

For consistency in comparing results from year to year, Ecology continues to include the same materials in the calculation of the MSW recycling rate that have been included since 1986. The materials included in the MSW recycling rate are ones that were defined as originating from the municipal solid waste stream, as Ecology defined it when designing the recycling survey in the mid-1980s. Table 5.2 provides tonnage figures for each material that figured into the MSW recycling rate from 2001 to 2004.

Other "diverted" materials are surveyed and reported; however, the inclusion of these materials in the MSW recycling rate would make the comparison invalid for the trends over time, since these materials either lie outside of the municipal solid waste stream or they are recently entering the recycling stream. For the most part, the diverted materials are collected and processed outside of 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 constitute a diversion of the material from the landfill. Diverted materials reported that were not included in the MSW recycling rate for 2001 through 2004 are included in Table 5.3.

Table 5.2
MSW Recycled Tonnage Reported
MSW Recycling Rates[14] 2001-2004

Recycled Materials Reported (MSW)	2001	2002	2003	2004
Aluminum Cans	12,540	12,718	17,608	**16,010**
Computers & Parts	317	1,414	3,587	**6,568**
Container Glass	81,632	64,937	74,126	**81,405**
Corrugated Paper	491,230	417,534	430,750	**535,662**
Ferrous Metals	254,104	432,778[15]	709,881	**866,641**
Fluorescent Light Bulbs	346	417	772	**732**
Food Waste	193,024	70,904	100,755	**126,257**
Gypsum	29,883	51,089	76,946	**35,648**[16]
HDPE Plastics	4,841	6,029	8,485	**7,991**
High-Grade Paper	58,538	62,312	59,502	**70,210**
LDPE Plastics	6,603	9,775	17,925	**10,604**
Milk Cartons/Drink Boxes-Tetra	69	26	1,789	**8**
Mixed Paper	231,302	206,051	219,111	**230,934**
Newspaper	176,392	187,585	215,882	**261,306**
Nonferrous Metals	41,615	61,240	114,604	**99,317**
Other Recyclable Plastics	4,067	949	3,482	**7,783**
Other Rubber Materials	374	166	5	**12**
PET Plastics	4,661	5,886	6,060	**6,748**
Photographic Films	87	517	530	**522**
Textiles (Rags, Clothing, etc.)	10,127	9,440	15,497	**28,927**
Tin Cans	11,483	9,417	9,492	**10,082**
Tires	10,306	27,102	27,753	**37,568**[17]
Used Oil	38,288	43,367	56,344	**104,211**
Vehicle Batteries	16,297	12,158	18,780	**25,518**
White Goods	39,180	43,833	53,353	**56,920**
Wood	538,242	394,261[18]	208,920	**257,495**
Yard Debris	448,222	380,882	546,487	**646,674**
Total MSW Recycled	**2,703,772**	**2,512,788**	**2,998,428**	**3,531,753**
Total MSW Disposed[19]	**4,611,406**[20]	**4,703,879**	**4,805,202**	**4,917,870**
Total MSW Generated	**7,287,025**	**7,216,667**	**7,803,630**	**8,449,623**
MSW Recycling Rate	**37%**	**35%**	**38%**	**42 %**

[14] Detail may not add due to rounding.
[15] Increase can be attributed to greater reporting from recyclers.
[16] Decrease can be attributed to a drop in reporting for this material.
[17] Includes recycled and retreaded tires.
[18] Decrease can be attributed to breaking down into more detailed categories of uses of wood (i.e., wood burned for energy recovery is tracked, but not included with MSW recycled - see diversion numbers below for wood burned for energy recovery.)
[19] The amount of MSW disposed of 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.
[20] Figure corrected for error in Whatcom County disposal.

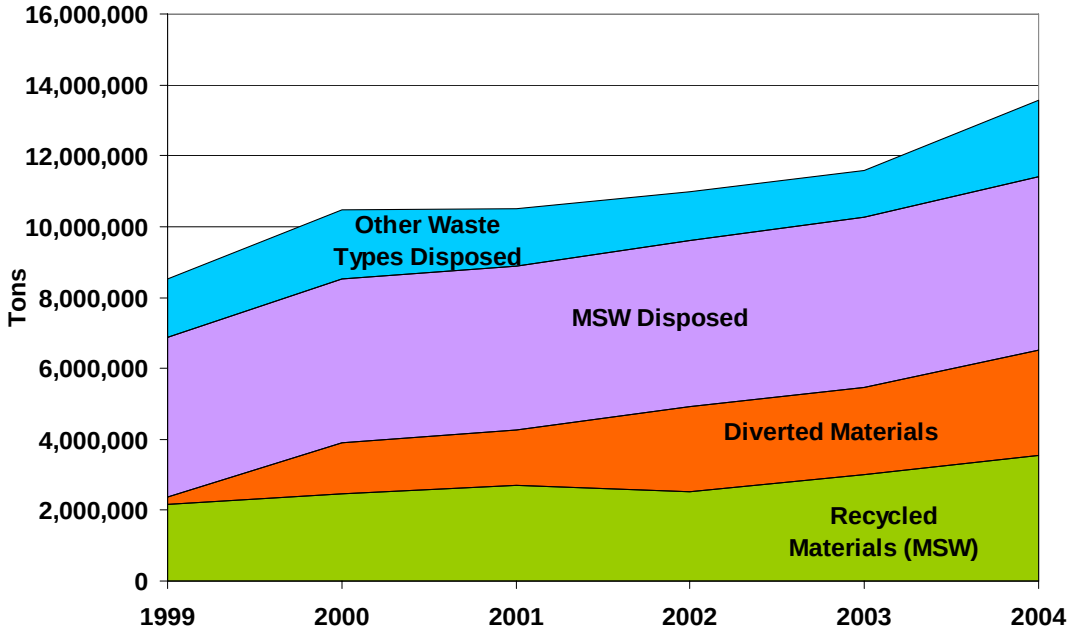
Table 5.3
Diverted Material Tonnage Reported
Diversion Rates[21] 2001-2004

Diverted Materials Reported	2001	2002	2003	2004
Antifreeze	4,157	4,506	4,722	**8,050**
Ash, Sand & Dust used in Asphalt Production	12,333	290	10,576	**40,409**
Asphalt & Concrete	1,116,871	1,451,959	1,600,288	**2,002,171**
Carpet and Pad	820	148	258	**304**
Composting Furnish	91,495	67,338	36,049	**44,419**
Construction & Demo. Debris	131,922	131,701	143,844	**166,325**
Donated Food & Merchandise	N/A	N/A	N/A	**306**
Food Processing Wastes	N/A	N/A	3,774	**3,185**
Household Batteries	38	333	143	**149**
Industrial Batteries	N/A	5	30	**29**
Landclearing Debris	151,464	286,201	160,158	**268,486**
Mattresses	N/A	77	N/A	**N/A**
Miscellaneous	16	N/A	40	**5**
Oil Filters	5,942	5,023	1,750	**3,719**
Other Fuels (Reuse & Energy Recovery)	N/A	121,349	2	**115**
Paint - reused	87	434	389	**688**
Post-Industrial & Flat Glass	N/A	2,364	2,976	**2,253**
Post-Industrial Plastics	N/A	8,118	N/A	**N/A**
Reuse (Clothing & Household)	601	79	918	**738**
Reuse (Construction & Demolition)	1,975	76,629	11,927	**5,853**
Reuse (Miscellaneous)	334	310	7,488	**215**
Roofing Material	11,727	13,825	6,493	**8,186**
Tires (Burned for Energy)	N/A	2,818	9,664	**15,400**
Tires (Retreads)	1,009[22]	1,170	12,976	**251**[23]
Topsoil	N/A	N/A	228,202	**269,460**
Used Oil for Energy Recovery	19,786	30,838	15,580	**825**[24]
Wood Fiber/Industrial Paper	N/A	N/A	13,767	**213**
Wood for Energy Recovery	12,460	196,100	189,584	**129,927**
Total Diverted[25]	**1,563,035**	**2,401,615**	**2,461,597**	**2,971,681**
Total MSW Recycled	**2,703,772**	**2,512,788**	**2,998,428**	**3,531,753**
Total MSW Disposed	**4,611,406[26]**	**4,703,879**	**4,805,202**	**4,917,870**
Other Wastes Disposed[27]	**1,620,745**	**1,380,396**	**1,316,850**	**2,144,901**
Total Waste Generation	**10,498,958**	**10,998,676**	**11,582,076**	**13,566,205**
Diversion Rate	**41%**	**45%**	**47%**	**48%**

[21] Detail may not add due to rounding.
[22] Includes tires burned for energy.
[23] A portion of the retreaded tires reported in 2004 are included with recycled tires.
[24] A portion of the used oil burned for energy recovery is reported as recycled and included above.
[25] Excludes materials included under "MSW Recycling."
[26] Figure corrected for error in Whatcom County disposal.
[27] "Other wastes" includes demolition, inert, wood, tires, medical waste and other wastes. It excludes industrial wastes, asbestos, sludge, and contaminated soils.

See also Figure 5.3 for a comparison of Washington waste generation since 1999.

Figure 5.3
Washington Waste Generation – Disposed, Diverted and Recycled[28]



Recovered Material Trends[29]

There are essentially two factors that have caused the recycling rate to increase in 2004. They are increased materials markets for metals and paper, and increased yard waste collection. The markets for ferrous and nonferrous metals rose again in 2004, due to the steady high prices for these commodities, spurred by the great foreign and domestic demand. Paper markets showed a considerable increase as well, due to strong markets. The increase in the collection of yard debris is most likely attributable to the increase in the number of collection programs around the state and the effort being put into these programs.

Recovered Paper

Recovered paper (including corrugated paper, newspaper, mixed paper, and high grade paper) is one of the dominant categories in the recycled materials stream. (See Table 5.2.) In 2004, foreign markets showed high demand for recovered paper, although domestic markets also improved over 2003. Figure 5.4 and 5.5 show the increase in corrugated paper recovery and newspaper recovery for 2004.

[28] "Other waste types" includes demolition, inert, wood, tires, medical waste and other wastes. It excludes industrial wastes, asbestos, sludge, and contaminated soils.
[29] The detail in this section refers to both MSW recycling and diverted materials.

The market for corrugated paper is showing a great recovery after a drop in mid-2000 that continued through 2002. Out of all the paper products, corrugated paper has the largest increase in recovery. Tonnage collected increased by 104,912 tons or 24% in 2004. Mixed paper recovery increased by 5% to continue a 2-year increase. High-grade paper saw a great increase of 18% from 2003 totals. Newspaper, with a 21% increase over 2003, has the second largest increase in recovery of the paper products.

Figure 5.4
Corrugated Paper Recycled 1999 to 2004

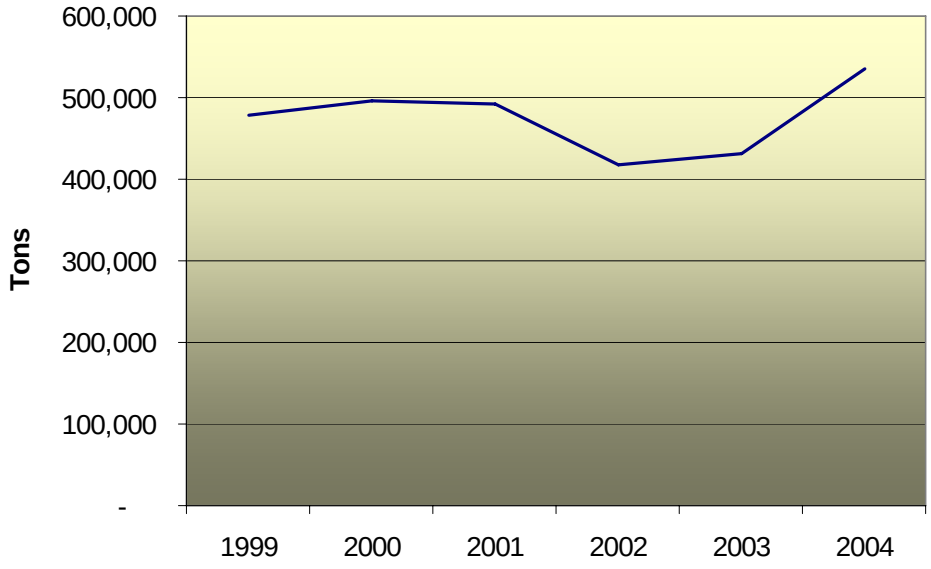
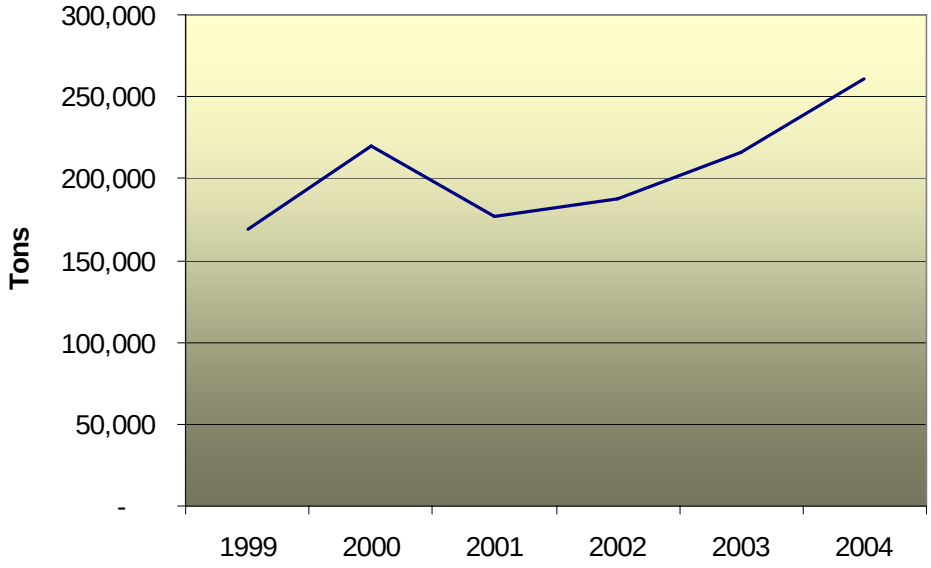


Figure 5.5
Newspaper Recycled 1999 to 2004



Organic Materials

Organic materials tracked through the recycling survey are yard debris, wood, food wastes, other materials used in composting (such as manures) and some other agricultural wastes. Since 1999, recyclers have since been asked to report organic material that falls outside of the municipal solid waste stream, such as wood burned for energy recovery and food processing wastes. See tables 5.2 and 5.3 for details on the types of organic material that are considered as part of the MSW recycling stream and those that are considered diversion from disposal.

With yard debris collection leveling off in 2001 and dropping in 2002, pending the construction and permitting of new composting facilities, wood surpassed yard debris in amounts collected. Yard debris has come out ahead again in 2003 and 2004 as the dominant organics category. (See Figures 5.6 and 5.7 for trends in yard debris and wood collection).

Figure 5.6
Yard Debris Recycled 1999-2004

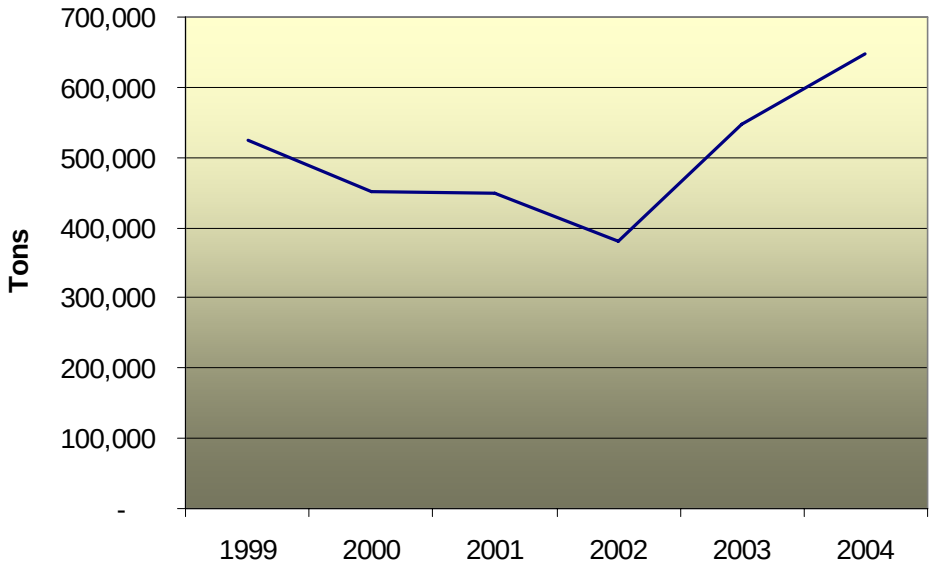
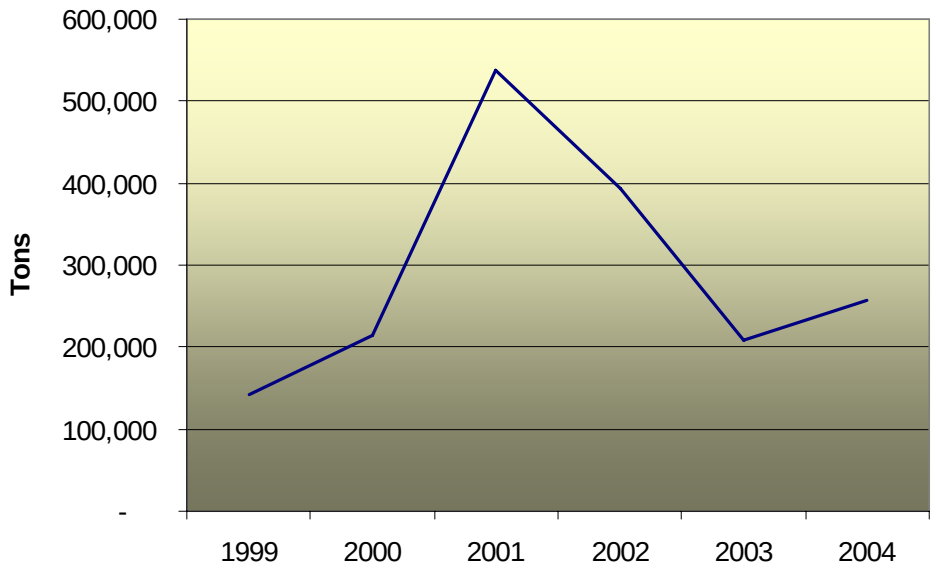


Figure 5.7
Wood Recycled 1999-2004



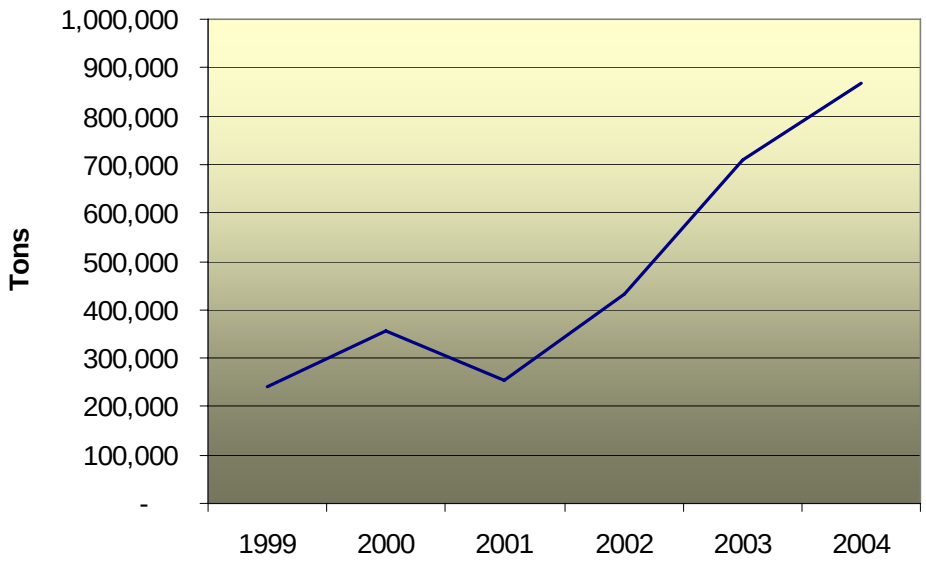
The great increase in reported tons of wood collected for recycling in 2001 and 2002 is due both to an actual increase of activity in the area of wood recycling, *and* to the improved reporting of data on the high amounts of wood that are traditionally recycled in Washington State. Even though the recycling survey has tracked wood in the past, greater emphasis is now being placed on the importance of including this data, which has resulted in better reporting. (See Table 5.3 for greater detail on other uses of wood reported, such as landclearing debris and wood burned for energy.)

The amount of food waste recovered, including rendering of fats and oils, increased by 25% in 2004.

Scrap Metal

Scrap metal recovery in Washington increased significantly from 2003 to 2004 (see Table 5.2). Reported tons of ferrous metal, white goods and tins cans increased in 2004, with aluminum cans and nonferrous metals decreasing. Ferrous metal increased most dramatically, by 156,760 tons or 22% (see Figure 5.8). Ferrous metal recycling in Washington state includes auto hulks and other industrial scrap. Starting in 2002, Ecology has worked more closely with metals recycling firms to set up improved tracking systems in an attempt to improve the quality of the reporting in this area. This effort, combined with the shift in reporting requirements for permit-exempt facilities, has given more stability to the reporting in the scrap metals sector.

Figure 5.8
Ferrous Metal Recycled 1986 to 2004



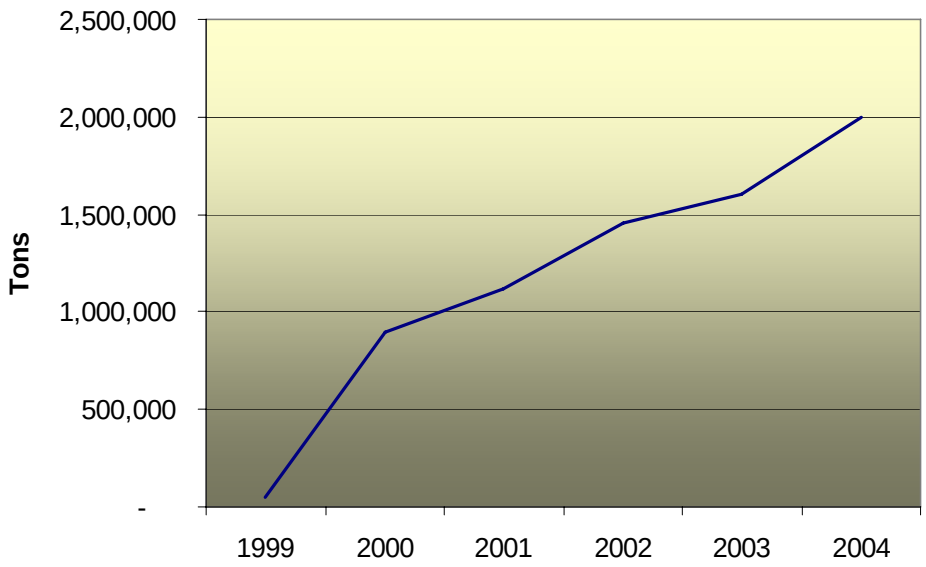
Construction and Demolition Materials

The best example of materials recovery from a waste stream that is outside of the traditional municipal solid waste stream, or "diversion", is from the construction and demolition waste stream. Many construction and demolition related materials are now being recovered for recycling or diverted from landfill disposal, including asphalt, concrete, roofing material, dimensional lumber, various grades of metals, and more.

There are five predominant types of final uses of the diverted materials measured. They are transforming or recycling into the same or other products, burning for energy, reuse, use as aggregate material for other products, and composting. Some material types have one unique final disposition; however, there is often more than one final use for a material depending on the market prices and demand.

There have been great successes over the past few years in diverting large amounts of material from the construction and demolition sector. There are many new programs and facilities around the state to recycle asphalt and concrete, landclearing debris and other construction and demolition related items. Asphalt and concrete collected for recycling has increased dramatically since Ecology began tracking these materials in 1999 (see Figure 5.9). Construction and demolition related materials represent about 95% by weight of the diverted materials reported. Asphalt and concrete alone account for 67% of the total diverted materials (see Table 5.3).

Figure 5.9
Asphalt and Concrete Recycled 1986 to 2004



Scrap Tire Use and Tracking

With the passage of SHB 2308, Ecology began to report annually to the Legislature on tire use and recycling in Washington. The first of these reports, published in December of 2002 and entitled "SHB 2308: Scrap Tire Report," contains a comprehensive overview of scrap tires in Washington. This report can be downloaded at http://www.ecy.wa.gov/biblio/0207029.html. [30]

Recycling, recapping, and energy recovery of tires is determined through a combination of annual reports from recyclers, the recycling survey, and a telephone survey of firms that transport and process used tires. Data on the disposal of used tires is obtained through annual reports from landfills, the recycling survey, and a telephone survey of tire handlers.

Of the 4,027,353 tires reported to Ecology for 2004, 0.4% were recapped or retreaded, 54.9% were recycled, and 22.5% were used as tire-derived fuel or burned for energy (see Table 5.4). The remaining 22.3% reported were disposed of in permitted public and private landfills in Washington and Oregon.

[30] The 2004 scrap tire report to the legislature, including information on scrap tire generation, can be obtained by contacting Gretchen Newman at gnew461@ecy.wa.gov or 360-407-6097 in the Solid Waste & Financial Assistance Program.

Table 5.4
Used Tires in Washington State
Breakdown of Reported Uses (2004)

Use Type	Tons of Used Tires	Number of Used Tires[31]	Percent of Tires Reported
Recapping[32]	251	14,765	0.4%
Recycled	37,568	2,209,882	54.9%
Tire-Derived Fuel	15,400	905,882	22.5%
Landfill Disposal	15,246	896,824	22.3%
Total Tires Reported	**68,465**	**4,027,353**	**100%**

There were approximately 14,765 used tires reported as recapped that were generated in Washington State in 2004.

There were approximately 2,209,882 used tires reported as recycled in Washington for 2003. Tire recycling, for purposes of this report, includes production of granules or sheet rubber from tires for use in bumpers, mats, playground equipment, or other laminated rubber products. Most of the tires reported as recycled are accurately accounted for; however, in 2004 some of the tires reported to Ecology on the annual recycling survey were actually recapped and the reporting company could not separate them from the amount recycled.

It is true for other companies reporting "recycled" tires, that the tires reported are what the reporting entity *collects*, and are actually destined for all of the different tire markets. Primary collectors simply may not know the eventual use of the collected tires that are hauled to supposed "recyclers." Also, not all handlers responded so the recycled amount should be considered a minimum level.

Chipped tires that have been processed to reduce the steel wire content and converted to useable size for a substitute fuel (referred to as "tire-derived fuel") can be marketed as a supplementary fuel to power plants, cement kilns, and industrial boilers. There were approximately 905,882 used tires reported to have been burned for fuel in 2004.

Most landfills in Washington State do not accept significant quantities of whole tires for disposal. Even so, a certain amount of tires continue to enter the mix of municipal solid waste. Tires generated in Washington and reported to Ecology as disposed of at Washington landfills and private non-MSW landfills in Oregon totaled 15,246 tons in 2004, or about 896,824 tires.

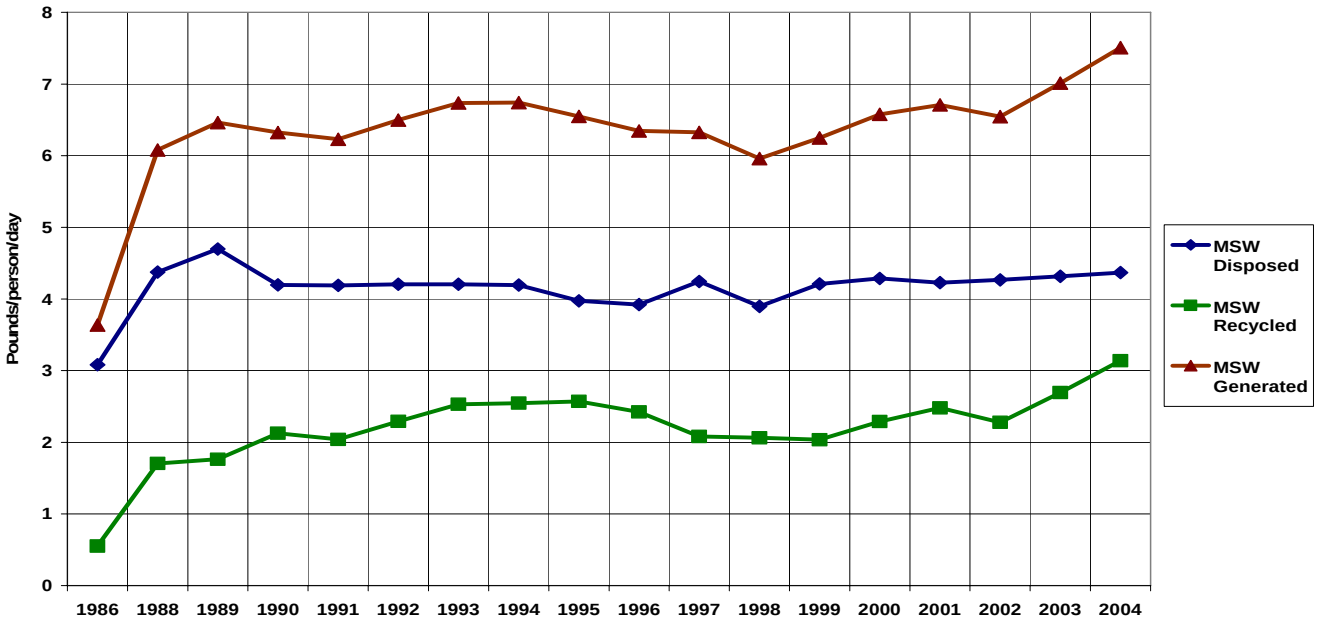
Individual Waste Generation (MSW)

Each person individually contributes to the municipal solid waste stream through recycling and disposal of their household wastes. While the figures given below for how each individual contributes are only an average of the total contributions of all residents, and some people may actually be much larger contributors than others, the picture tends to be more

[31] Calculated based on tons reported, assuming an average weight of 34 lbs per tire. Passenger car tires are assumed to weigh 20 lbs; truck tires are assumed to weigh 100 lbs.
[32] Based on one company's report, a portion of the tires reported as recycled includes tires that were actually recapped.

tangible for some when described in individual or "per person" terms. Figure 5.10 illustrates an average of how each person in the state contributes to the **municipal solid waste stream**. (See Chapter VI for a discussion of the overall waste generation numbers.) In 2004, each resident of the state generated 7.51 pounds of municipal solid waste per day, an all-time high for Washington; 4.37 pounds were disposed of and 3.14 pounds were recovered for recycling (see table 5.5).

Figure 5.10
Pounds MSW Disposed, Recycled, and Generated Per Person/Day
1986-2004



Washington residents generate, recycle and dispose of about 2-pounds of MSW per person above the national averages. The difference is accounted for by Washington's relatively larger amounts of yard and wood waste than the national average, as well as a different measurement of ferrous metals. Along with review by county recycling coordinators and end-use information on recovered materials, comparing per capita numbers to other states' averages provides a check for Washington's recycling numbers.

Table 5.5
Pounds MSW Disposed, Recycled and Generated Per Person/Day
1993-2004

MSW	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Disposed	4.21	4.19	3.98	3.92	4.24	3.90	4.21	4.29	4.23	4.27	4.32	**4.37**
Recycled	2.53	2.55	2.57	2.42	2.08	2.06	2.04	2.29	2.48	2.28	2.69	**3.14**
Generated	6.74	6.74	6.55	6.35	6.32	5.96	6.25	6.58	6.71	6.55	7.01	**7.51**

Chapter VI
Disposal of Solid Waste in Washington

One of the fundamental aspects of implementing the *Beyond Waste Plan* involves a shift from managing wastes at the end of the pipe to preventing them from being generated in the first place wherever possible. Recognizing that many wastes will continue to be generated, the B*eyond Waste Plan* also calls for valuing these materials as resources, and moving them into closed-loop recycling systems instead of disposing them.

In order to measure the progress of *Beyond Waste*, a knowledge and tracking of the amount and types of waste that are disposed is essential. One of the goals of this report is to identify the types and quantities of solid waste disposed in the various types of landfills and energy recovery facilities in the state. This includes waste imported into the state for disposal and waste exported to Oregon. For Washington State itself, the amount of waste disposed by Washington citizens, whether in landfills and energy recovery facilities in Washington or in Oregon, is also identified.

Landfilling is the basic method of final disposal and includes three types of landfills - municipal solid waste landfills, limited purpose landfills and inert landfills.

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*, forms were sent to the various types of landfills for them to report the types and quantities of waste they received for disposal. The facilities were also asked to report the source of their waste:

- out-of-county
- out-of-state
- out-of-country

In addition, three landfills in Oregon accept waste from Washington: Finley Butte, Wasco and Columbia Ridge. Waste information from each facility is used in preparing this report.

The other method of waste disposal in Washington is energy-recovery facilities. Annual report forms were also sent to these facilities. The same type of waste information was requested.

Determining the Amount of Solid Waste Disposed

The figure arrived at for the amount of solid waste disposed varies depending upon the types of wastes included, the source of waste generation or the types of facilities included in the calculation. In 1999, Ecology started to track more waste that was diverted from disposal in addition to the traditional materials that are recycled (see Chapter V for a more detailed discussion). In addition, in 2002 Ecology determined that to have a more complete understanding of the waste generated in the state, that all materials that were disposed of in any type of landfill or incinerator by Washington citizens needs to be used. The numbers discussed below include for the past years the recycling/diversion numbers as well as all

wastes disposed by Washington citizens in municipal solid waste landfills, inert landfills, limited purpose landfills and energy recovery/incinerator facilities.

Total Waste Disposed in Washington State

In addition to municipal solid waste landfills and incinerators, two other categories of landfills for which information was obtained include inert and limited purpose. The waste disposed in these facilities is more typically generated by the private sector (business and industry).

To gain a complete picture of solid waste disposal in the state, it is necessary to include all categories of waste that are disposed or incinerated in Washington State landfills and incinerators. This includes waste imported from out-of-state, but does not include exported waste. When all categories are included, 7,418,978 tons of waste was disposed of in all types of landfills and incinerators in Washington in 2004 (see Table 6.1). For total solid waste disposed from 1993-2004 see: http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 6.1
Total Amounts of Solid Waste Disposed in Washington

DISPOSAL METHOD	1997	1998	1999	2000	2001	2002	2003	2004
Municipal Solid Waste Landfills	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561	4,572,275	5,506,112
Incinerated Waste	551,006	369,778	461,684	554,780	496,152	311,474	303,978	327,837
Woodwaste Landfills*	95,325	59,410	102,484	87,552	53,298	33,171	34,188	*
Inert/Demolition Landfills	600,149	494,528	536,155	477,383	733,843	476,917	476,214	509,927
Limited Purpose Landfills	695,783	628,896	569,747	646,662	645,592	605,284	586,670	1,075,102
TOTAL	6,475,181	6,134,719	6,408,878	6,425,959	6,453,904	6,171,407	5,973,325	7,418,978

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

Increased amounts of waste were reported for many of the categories including municipal solid waste, demolition waste, industrial waste, inert waste, ash (other than special incinerator ash), asbestos and medical. There was a slight decrease in woodwaste, sludge, PCS, tires and the Other category. Part of the decrease for petroleum contaminated soils could be accounted for by a new waste category of "other contaminated soils." In the past that material may have been included in the PCS category.

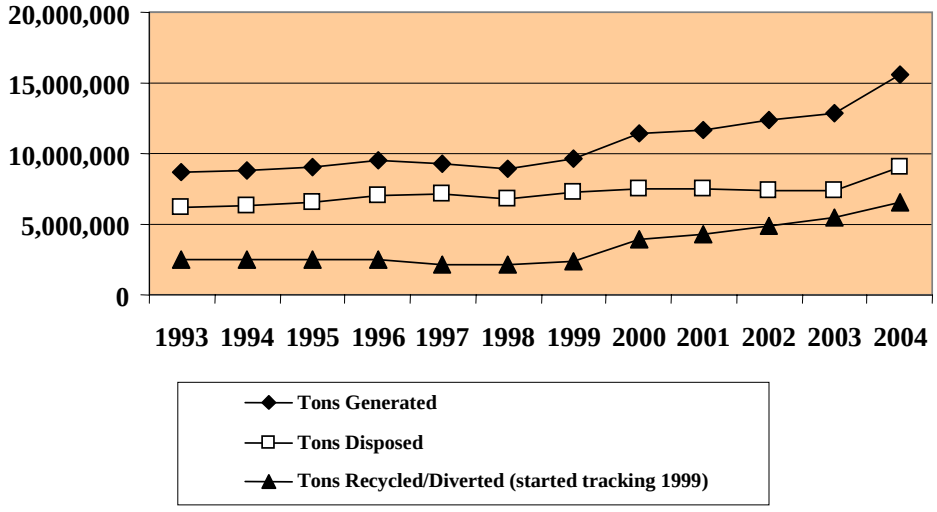
A significant amount of the increase can be attributed to the amount of dredged sediments disposed at landfills. As cleanup of Puget Sound area contaminated sites continues, the waste stream will be a contributing factor to the amount of materials disposed.

Waste Generated by Washington Citizens

Since 1987, Ecology has conducted a recycling survey that has reported the amount of waste generated, recycled and disposed each year. This waste stream was the "recyclable waste stream" made up of waste types included in the recycling categories, but not including sludge, asbestos, petroleum contaminated soils, construction and demolition, or industrial waste (when it could be specifically identified[33]). It was also typically the waste stream generated and reported by municipalities (cities and counties). The report for the recycling survey included waste that was disposed of outside of Washington, but excluded imported waste.

Figure 6.1 shows the amount of waste recycled, disposed and generated in Washington. It is based on waste disposed at all types of landfills and incinerators in Washington and Oregon, excluding imported waste. All types of waste are included in the disposal numbers. Spreadsheets which identify the disposal location, type and amount of waste for each county for 2004 and previous years information can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/. This provides a summary of the amounts and types of waste disposed by Washington citizens, both in Washington and Oregon landfills and energy recovery and incineration facilities.

Figure 6.1
Washington State Trends in Solid Waste
Generated Recycled/Diverted & Disposed (in tons)



The trend until 1997 showed an increase in the amounts generated, recycled, and disposed. The recycling rate remained fairly flat from 1997 to 1999. In 1999, Ecology started tracking additional information on materials diverted from disposal in addition to the traditional

33 Some facilities and government entities that report information for the annual recycling survey on waste generated and disposed include other waste in with the total for municipal solid waste. These waste types are typically inert, demolition, industrial, and commercial.

materials recycled (see Chapter V for a more detailed discussion). With the disposal rates continuing to increase, and the recycling and diversion amounts also increasing, the amount of waste generated continues to rise.

Washington State's population has continued to grow since disposal numbers were tracked in 1991 (see Table 6.2). The increased population has had a correlated increase in waste generated. However, the increase in waste disposed, as well as the amount being recycled and diverted, has increased at a faster rate than the population, indicating a likely increase in materials generated per capita.

In addition, part of this increase may be accounted for by better reporting and increased types of waste included in the annual reporting forms sent to disposal facilities. New regulatory requirements for recyclers have also improved the reporting received from them (see Chapter V Measuring Recycling and Diversion for more details). In addition, there was an increase in the amount of dredged sediments disposed at landfills, adding over 900,000 tons to the total waste disposed. As cleanup of Puget Sound area contaminated sites continues, this waste stream will be a contributing factor to the amount of materials disposed.

Table 6.2
Washington State Population

Year	Population
1991	5,000,385
1992	5,116,685
1993	5,240,900
1994	5,334,400
1995	5,429,900
1996	5,516,800
1997	5,606,800
1998	5,685,300
1999	5,757,400
2000	5,803,400
2001	5,974,900
2002	6,041,700
2003	6,098,300
2004	6,167,800

Figure 6.2 shows the trends in per capita generation, recycling and disposal. This looks at the number of tons per year generated, recycled and disposed by each person. The total is not what each person produces at each household, but includes all residential, business, commercial and industrial waste generated in the state that is disposed of in municipal solid waste landfills and incinerators. Table 6.3 how the per capita numbers (pounds/person/day) from 1995 through 2004.

Figure 6.2
Washington State Trends in Solid Waste
Generated, Recycled & Disposed (tons/per/year)

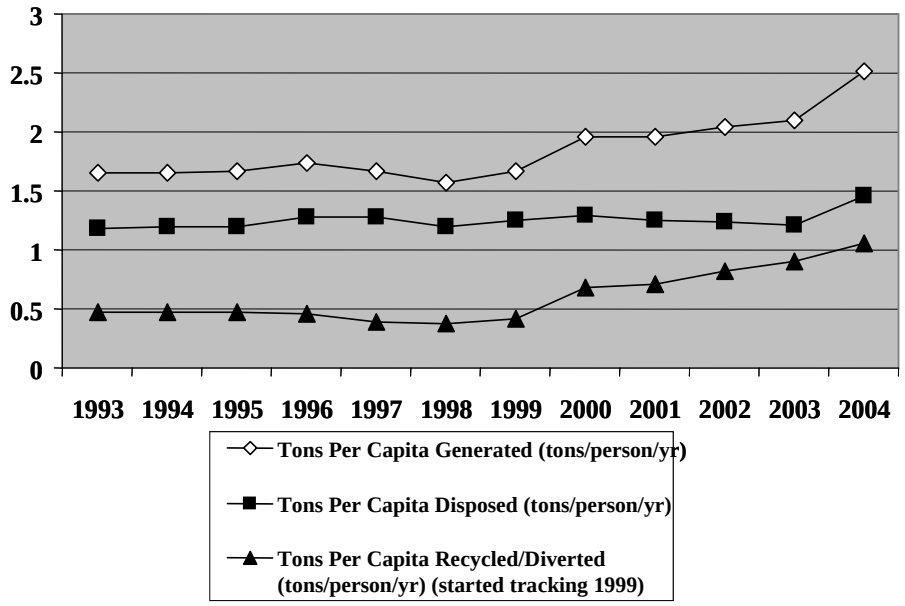


Table 6.3
Per Capita Disposed, Recycled/Diverted and Generated Numbers
(pounds/person/day)

Per Capita	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Disposed[34]	6.49	6.51	6.56	7.00	7.00	6.57	6.87	7.06	6.84	6.74	6.62	8.03
Recycled	2.58	2.56	2.56	2.51	2.10	2.05	2.25	3.69	3.91	4.46	4.91	5.78
Generated	9.08	9.07	9.12	9.51	9.10	8.61	9.12	10.75	10.75	11.20	11.52	13.80

With the overall total of waste being disposed increasing, along with the recycling diversion rates, the generation of waste continues to increase. While some of the waste can be attributed to cleanup of contaminated areas, many other waste categories are also showing an increase. The increase in the generation of waste is addressed by the revised state solid waste plan, *Beyond Waste*, completed in November 2004, which provides the vision for reducing the amount and impact of wastes and focuses efforts on waste prevention and reduction by state and local government, the private sector, and citizens of the state.

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

Municipal Solid Waste Landfills

Amount of Waste Disposed in Municipal Solid Waste Landfills

In 2004, 17 municipal solid waste landfills accepted waste totaling 5,506,112 tons.[35] Of the 17 landfills, 13 were publicly owned, and four were privately owned.

Five of the 17 landfills received over 100,000 tons of waste in 2004. 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 1,009,799 tons, 792,842 and 2,737,424 tons, respectively. In 2004, two landfills received less than 10,000 tons, compared with 12 MSW landfills in 1994. The Fort Lewis Landfill in Pierce County closed in the summer of 2004. The other small landfill is located in Grant County. The City of Tacoma Landfill received no waste and will be used for emergencies only in the future. This trend (Figure 6.3) indicates that the smaller facilities have been closing in response to more stringent regulations and some are reaching the limits of their capacity and are not planning on expanding.

Figure 6.3
MSW Landfill Size
(Number of Landfills Based on Disposed Tons per Year)

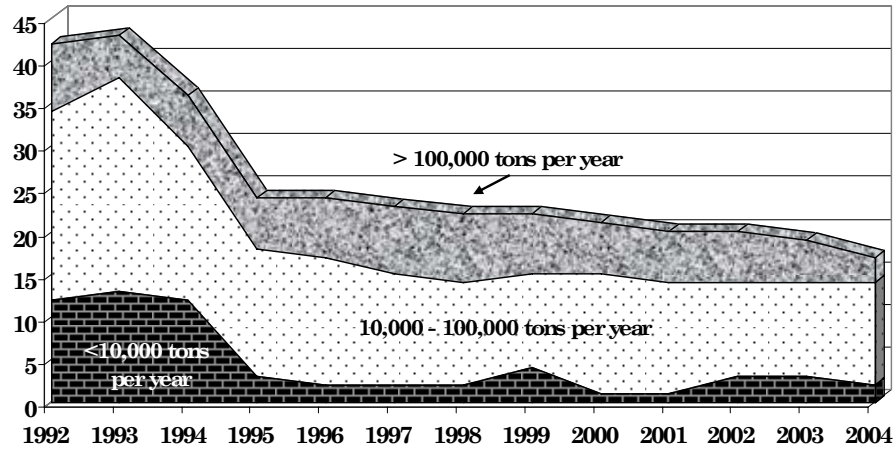


Table 6.4 shows the relationship of waste disposed to public/private ownership. As the table illustrates, 1,688,779 tons of solid waste disposed went to publicly owned facilities (31%), with the remaining 3,817,333 tons going to private facilities (69%).

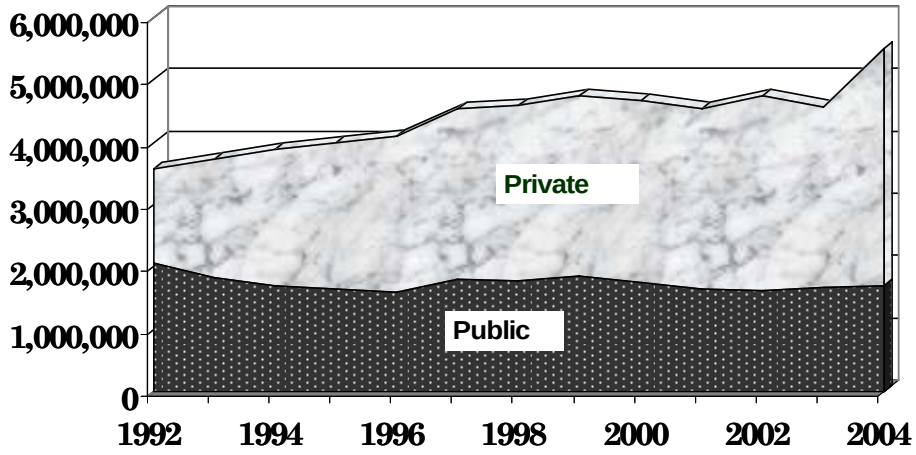
35 Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities being discussed, the source of the waste and the purpose of the discussion. For example, the recycling survey only accounts for "traditional" municipal waste in the disposed amount used to calculate the statewide recycling rate. See discussions in Chapter V and this chapter for further information.

Table 6.4
Waste Disposed in MSW Landfills – Public/Private

OWNERSHIP	NUMBER OF MSW LANDFILLS		AMOUNT OF WASTE DISPOSED (Tons)		% TOTAL WASTE DISPOSED	
	1991	2004	1991	2004	1991	2004
PUBLIC	36	13	2,696,885	1,688,779	69	31
PRIVATE	9	4	1,192,207	3,817,333	31	69
TOTAL	45	17	3,889,092	5,506,112	100	100

The amount of waste disposed in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (see Figure 6.4). The trend has continued since 1991, when the state first started tracking this type of information. The amount of waste disposed in the private facilities has increased from 31% since 1991 to 66% in 2004. The majority of this increased amount can be accounted for by the private Roosevelt Regional Landfill in Klickitat County and LRI-304th Street Landfill in Pierce County.

Figure 6.4
Comparison of Waste Disposed for
Public and Private Facilities (tons)



Types of Waste Disposed in Municipal Solid Waste Landfills

Traditionally, many people think of the waste disposed in MSW landfills as being mostly household waste.[36] 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. Fifteen of the 17 landfills reported other types of solid waste disposed, other than municipal solid waste. Demolition, industrial, inert, commercial, woodwaste,

36 "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).

sludge, asbestos, petroleum contaminated soils (PCS) and tires were the major waste streams. (Two landfills report all types of waste under the general "municipal" category so exact amounts cannot be determined.).

In 2004, new annual reports were developed by Ecology as part of the implementation of chapter 173-350 WAC, *Solid Waste Handling Standards*. The forms included an expanded list of waste types. For the amounts and types of waste reported by the individual municipal solid waste landfills in 2004 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

For a more consistent look at the waste stream over time, some categories were combined. Table 6.5 shows changes in waste, types and amounts disposed in MSW landfills from 1996 through 2004. For MSW landfill data from 1992-2004 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

Table 6.5
Waste Types Reported Disposed in MSW Landfills

WASTE TYPES	1996 (Tons)	1997 (Tons)	1998 (Tons)	1999 (Tons)	2000 (Tons)	2001 (Tons)	2002 (Tons)	2003 (Tons)	2004 (tons)
Municipal Solid Waste*	2,807,998	3,083,286	3,222,639	3,421,415	3,336,745	3,432,359	3,440,727	3,394,428	3,598,760
Demolition Waste	375,412	385,412	446,172	437,005	569,239	373,254	379,405	324,069	366,087
Industrial Waste	145,617	163,431	159,781	232,905	88,841	201,198	179,058	212,918	1,034,615
Inert Waste	30,061	117,512	107,452	23,875	19,349	26,376	17,092	2,635	1,705
Commercial Waste	109,093	173,863	158,256	129,070	93,752	66,391	99,048	93,036	0
Wood	57,667	57,128	60,383	68,889	47,087	34,254	55,149	47,622	25,576
Ash (other than SPI)	na	na	na	na	na	na	na	ma	3,444
Sewage Sludge	49,205	72,741	67,419	62,920	47,783	1,473	1,762	23,435	10,172
Asbestos	7,965	9,558	10,684	9,666	7,922	5,991	4,908	9,625	12,086
Petroleum Contaminated Soils	254,414	444,260	288,407	312,247	231,290	217,721	457,061	342,172	279,982
Other Contaminated Soils	na	na	na	na	na	na	na	na	49,454
Tires	12,787	14,912	19,130	12,581	43,188	8,567	5,776	9,512	7,462
Special	10	6	904	0	437	917	567	0	0
Medical	na	Na	na	na	239	387	372	2,459	2,565
Other**	233,526	10,809	40,880	28,235	173,711	156,131	103,636	110,364	114,204
TOTAL	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561	4,572,275	5,506,112

* 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 non-municipal ash, auto fluff and white goods.

Waste-to-Energy/Incineration

Three waste-to-energy facilities/incinerators statewide burned 327,837 tons of solid waste. Of that amount, 14,410 tons were identified as woodwaste at the Inland Empire Paper facility in Spokane and 43,059 tons of waste at the Ponderay Newsprint Company in Pend Oreille County. These two incinerators do not burn municipal solid waste. In 2004, less than 6% of solid waste was incinerated statewide. The highest percent of waste incinerated in the state

was 12% in 1995. For the amounts and types of waste incinerated in 2004 using the new reporting categories see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

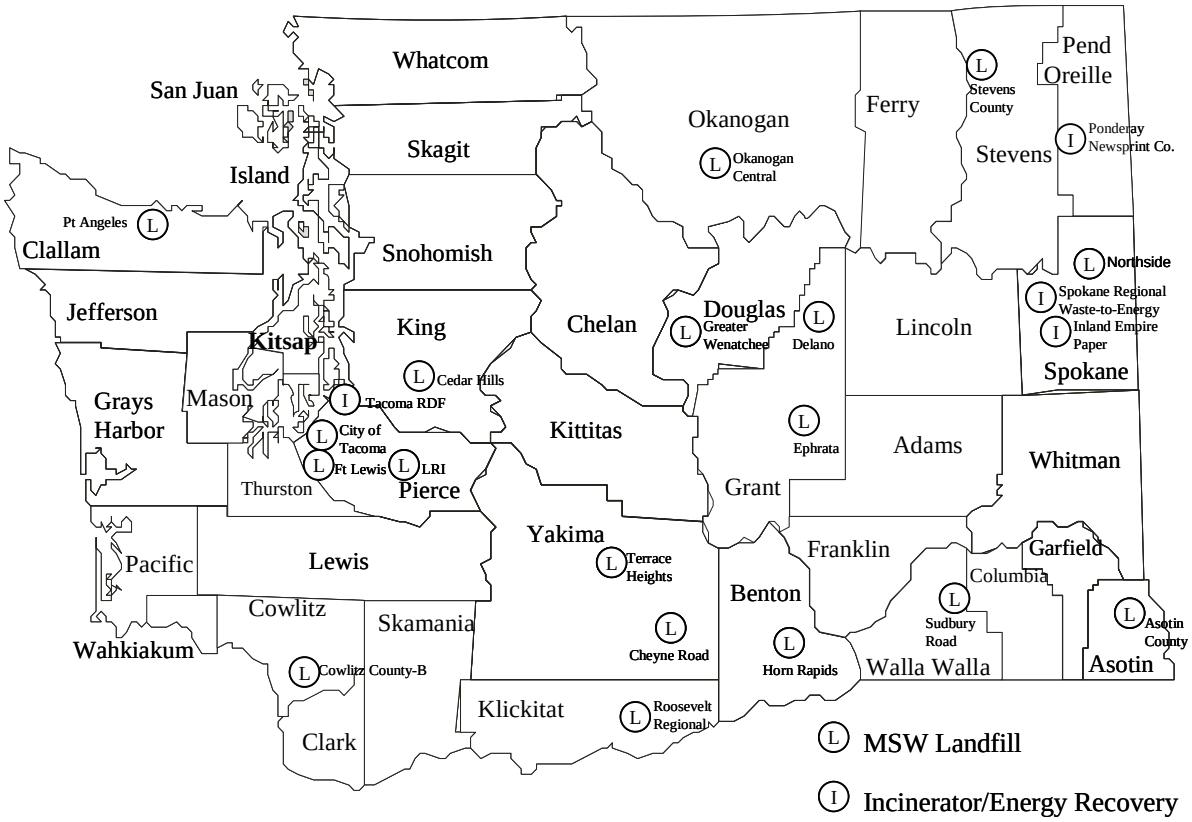
Ash Monofill

For waste-to-energy facilities or incinerators that are now regulated under chapter 173-350 WAC, *Solid Waste Handling Standards*, and chapter 173-306 WAC, *Special Incinerator Ash Management Standards* (see in Chapter II), the ash generated must be disposed in a properly constructed ash monofill. In 2004, there was one energy recovery/ incinerator that met this criteria. The municipal solid waste incinerator ash (83,875 tons) was disposed at the ash monofill at the Roosevelt Regional Landfill in Klickitat County.

Trends in Municipal Solid Waste Disposal Methods

The two basic ways to dispose of solid waste are landfilling and burning. (See Map A for the location of MSW landfills and energy recovery facilities.)

Map A: Location of MSW Landfills & Energy Recovery Facilities (as of October 2005)



A comparison of the amount of solid waste disposed in municipal solid waste landfills and waste-to-energy facilities and incinerators in 2004 is shown in Table 6.6.

Table 6.6
Waste Disposed in MSW Landfills
and Incinerators in 2004

FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	5,506,112	94.4%
Incinerators	327,837	5.6%
TOTAL	5,833,949	100%

In 1991, 98% of the waste was disposed in MSW landfills and 2% was incinerated. The highest percent of incinerated waste in the state, 12%, occurred in 1995. In 2004 less than 6% of the waste stream incinerated. The amount of waste incinerated will likely remain fairly stable, with only one operating municipal solid waste energy-recovery facilities, one energy recovery facility inactive at this time and no new facilities planned.

Inert Landfills and Limited Purpose Landfills

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

For 2004, annual report forms were received from the inert landfills and limited purpose landfills. For the amounts and types of waste reported by the individual inert and limited purpose landfills in 2004 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

For a more consistent look at the waste stream over time, some categories were combined for Table 6.7 for the waste types and amounts disposed in Inert Landfills from 1997 through 2004. For inert/demolition landfill data from 1992-2003 and inert landfill date for 2004 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

Table 6.7
Waste Types and Amount Disposed at
Inert/Demolition Landfills (in tons)

WASTE TYPES	1997	1998	1999	2000	2001	2002	2003	2004
Municipal	0	0	0	0	0	0	0	0
Demolition	262,793	180,268	173,088	259,255	211,901	243,593	95,008	28,967
Industrial	121	0	0	0	0	0	81,474	0
Inert	326,331	252,506	344,444	180,337	199,256	112,457	163,435	379,298
Commercial	0	0	0	0	0	0	0	0
Wood	0	156	336	536	167	445	1,082	2,526
Sludge	0	0	0	0	0	0	0	0
Asbestos	0	4	0	3	3	6	11	0
PCS	10,285	60,545	17,265	34,742	319,105	120,159	131,872	66,260
Tires	618	449	414	471	765	257	664	0
Other	1	600	605	2,039	2,646	0	2,668	33,472
TOTAL (tons)	600,149	494,528	536,155	477,383	733,843	476,917	476,214	509,927

For a more consistent look at the waste stream over time, some categories were combined for Table 6.8 for the waste types and amounts disposed in Limited Purpose Landfills from 1997 through 2004. For limited purpose landfill data from 1992-2004 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

Table 6.8
Waste Types and Amount Disposed at
Limited Purpose Landfills (in tons)

WASTE TYPES	1997	1998	1999	2000	2001	2002	2003	2004
Municipal	0	0	0	0	0	0	0	0
Demolition	85,916	98,072	84,140	71,203	71,817	98,827	68,946	174,519
Industrial	277,419	225,779	262,021	278,224	325,114	282,747	325,863	262,560
Inert	109,174	112,714	136,352	205,902	202,577	195,303	157,431	36,155
Commercial	0	0	0	0	0	0	0	0
Wood	14,589	7,700	8,853	3,205	6,841	2,747	8,420	32266
Ash (other than SPI)	na	na	na	na	na	na	na	533,201

WASTE TYPES	1997	1998	1999	2000	2001	2002	2003	2004
Sludge	2,275	0	1,103	0	0	0	0	0
Asbestos	1,310	1,058	1,549	1,654	1,282	1,311	1,302	1,581
PCS	121,066	56,407	8,837	7,159	13,222	9,888	4,890	20,399
Tires	434	559	59	25	41	59	81	713
Other	83,600	124,607	66,833	79,291	24,698	14,402	19,737	13,708
TOTAL (tons)	695,783	628,896	569,747	646,662	645,592	605,284	586,670	1,075,102

There is no longer a woodwaste landfill category under the new 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

Movement of Waste Between Counties

All landfills and incinerators were asked to report the source, types and amounts of waste they received from out-of-county. Seven of the 17 active MSW landfills reported receiving solid waste from other counties in 2004.

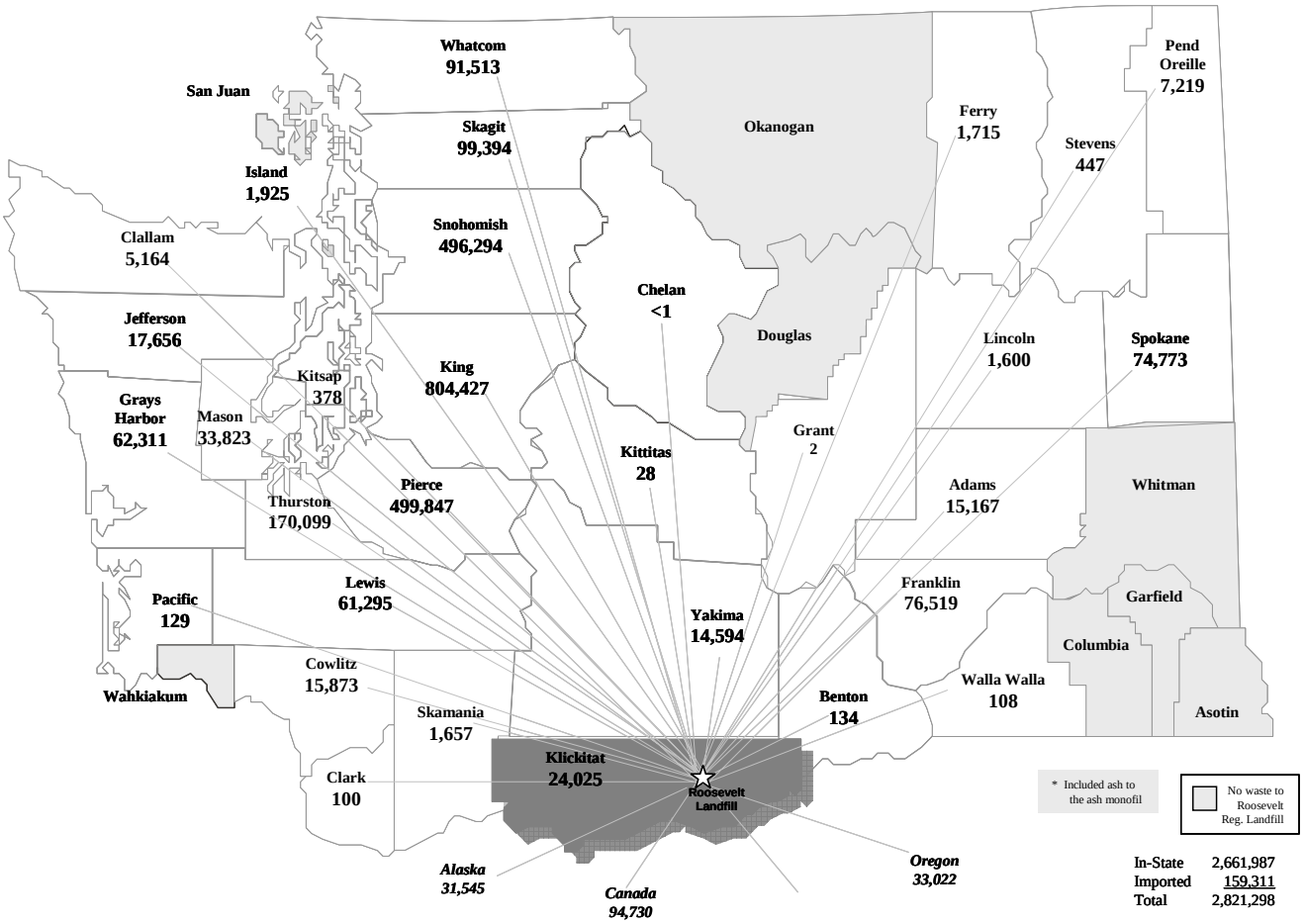
Some of the municipal solid waste movement was because of closer proximity to a neighboring county's landfill, especially for the smaller landfills which received municipal waste from other counties without there own landfills. Some of the waste disposed from other counties was non-municipal waste such as PCS, demolition 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 option. The Roosevelt Regional Landfill received some type of solid waste from 30 of the 39 Washington counties and also from out-of-state and out-of-country (see Map B). 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 30 counties rely on Roosevelt for the majority of their MSW waste 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 waste to Oregon facilities. Four other counties send a significant amount of waste to Oregon. Much of the waste that goes to the Columbia Ridge Landfill is Oregon is other than municipal solid waste.

In addition to waste movement to MSW landfills, the Spokane Regional Waste-to-Energy Facility received 1,478 tons of MSW waste from beyond its home county. Three inert landfills received 80,721 tons of waste and five limited purpose landfills received 48,599 tons of waste from other counties.

Spreadsheets which identify the disposal location, type and amount of waste for each county for 2004 and the previous year's information can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Map B: 2004 Solid Waste to Roosevelt Regional Landfill (in Tons)



Waste Imported from Outside the State

Washington State landfills and incinerators were also asked to report the source, types and amounts of waste received from out-of-state or out-of-country. In 2004, a total of 202,787 tons of solid waste, about 2.7% of the waste disposed and incinerated in Washington, was imported from beyond the state's boundaries for disposal at municipal solid waste landfills and energy recovery facilities. The amount of waste imported for disposal decreased from a high of 6% in 1996. Accounting for much of the drop in imported waste was the termination of a contract between Roosevelt Regional Landfill and a California entity.

The types of waste received from out-of-state for disposal are shown in Table 6.9. The majority of this waste (159,313 tons) went to Roosevelt Regional Landfill. Of that 94,732 tons were imported from British Columbia, with the remainder from Alaska (31,544 tons), Oregon (33,022 tons) and a minimal amount (15 tons) from California.

Table 6.9
Out-of-State Waste Disposed in Washington

Type of Waste	1991	2001	2002	2003	2004
Municipal Solid Waste	24,475	100,092	112,097	77,803	144,396
Demolition	1,412	4,370	6,104	3,824	3,477
Industrial	0	57,952	42,953	30,584	41,171
Inert	0	0	1,097	0	59
Woodwaste	208	2	35	28	1
Sludge	36	0	0	621	0
Asbestos	0	243	350	1,245	304
Petroleum Contaminated Soils	0	4,910	1,769	3,114	7,957
Tires	0	1,622	1.162	5,157	4,694
Medical	na	0	0	0	0
Other	0	33	359	508	728
TOTAL	26,131	172,696	165,935	122,884	202,787

Nez Perce County, Idaho, disposed of approximately 26,000 tons of MSW in the Asotin County Landfill. This disposal is considered incidental movement because Asotin County, Washington, and Nez Perce County, Idaho, prepared a joint local comprehensive solid waste management plan to meet the requirements of Washington State statute and have an agreement for joint use of the landfill.

In addition to the MSW landfills, the Spokane Regional Waste-to-Energy Facility received 136 tons of MSW from Idaho. Four limited purpose landfills imported a total of 16,503 tons of waste from Oregon, Idaho and Montana. The Weyerhaeuser limited purpose landfill in Cowlitz County received most of this waste (14,816 tons). One inert landfill received 835 tons of demolition waste from Idaho.

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2004, a total of 1,817,665 tons of waste generated in Washington was disposed in Oregon landfills, an increase from 705,608 tons in 1992. Table 6.10 compares the waste amounts and types exported and imported. (See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for imported totals for 1991-2004 and for exported totals 1993-2004.)

Table 6.10
Comparison of Imported-to-Exported
Waste for all Solid Waste Facilities

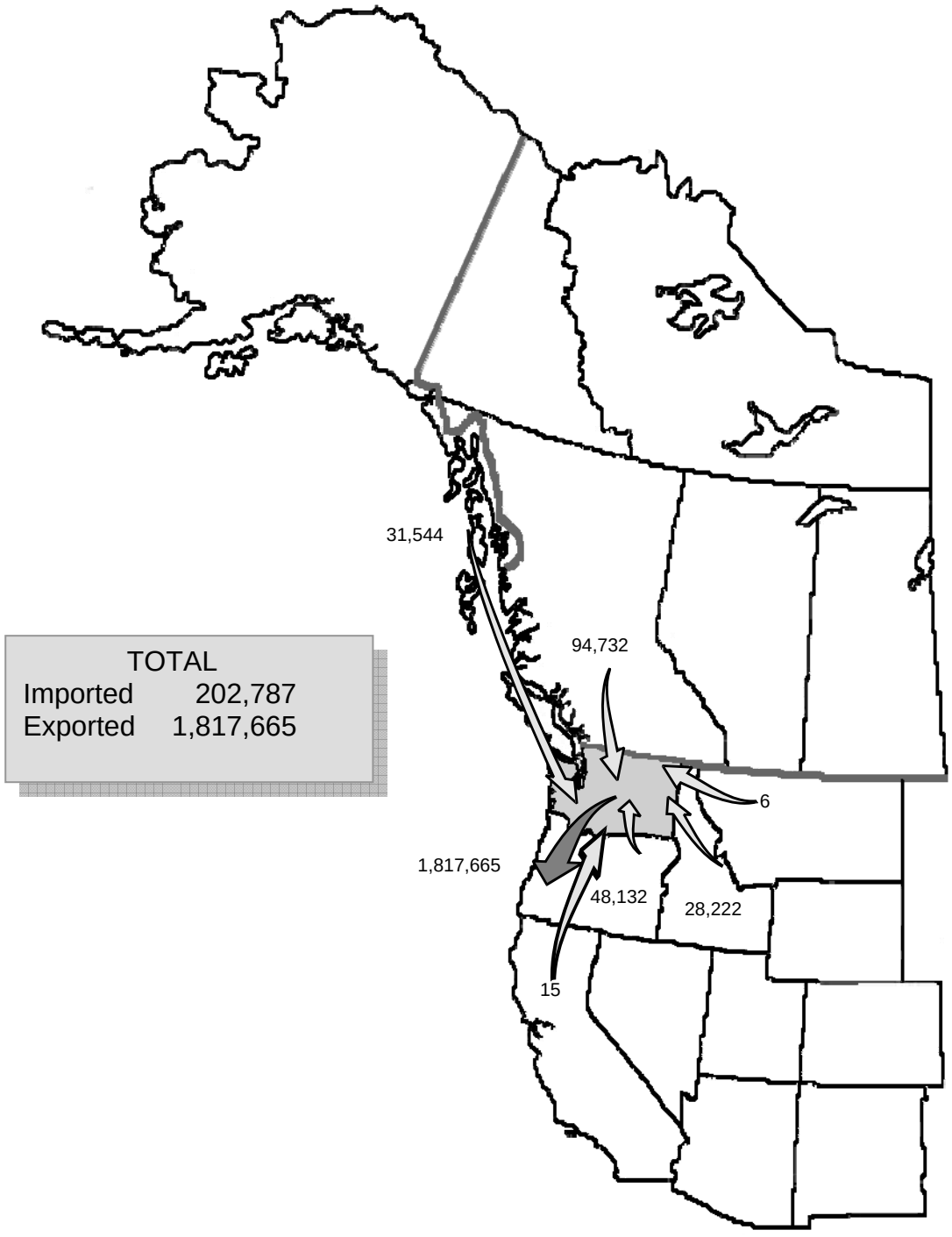
TYPE OF WASTE	IMPORTED		EXPORTED	
	1991	2004	1993	2004
Municipal Solid Waste	24,475	144,396	710,515	1,166,069
Demolition	1,412	3,477	2,245	316,075
Industrial	0	41,171	864	67,381
Inert	208	59	0	49
Woodwaste	36	1	0	4,499
Ash (other than SIA)	Na	0	Na	6
Sludge	0	0	0	0
Asbestos	0	304	1,623	4,683
Petroleum Contaminated Soils	0	7,957	22,308	124,141
Other Contaminated Soils	Na	0	Na	97,100
Tires	0	4,694	Na	0
Medical Waste	0	0	Na	68
Other	0	728	18,512	37,602
TOTAL	26,131	202,787	756,067	1,817,665

Major exporters of municipal solid waste in Washington included the City of Seattle (460,460 tons of MSW), Columbia County, Clark County, Island County, Pacific County, San Juan County, Skamania County, Whitman County, and a portion of Benton County, Franklin County, Kitsap County, Snohomish County and Whatcom County. Reasons for exportation out-of-state are related to the closure of local landfills, and negotiation of favorable long-haul contracts.

Trends in Interstate Waste Movement for Washington

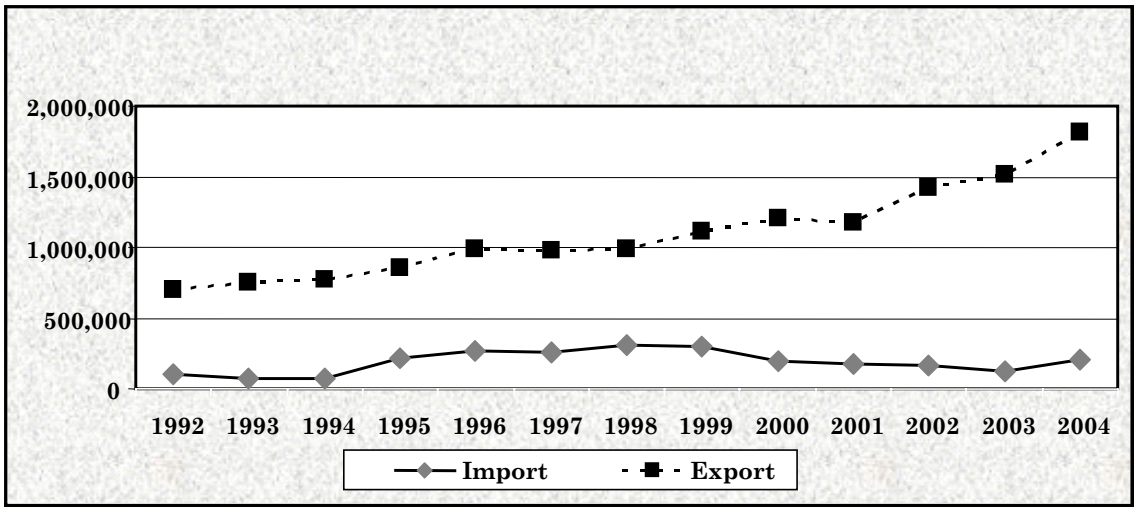
The first significant movement of waste across Washington State boundaries started in 1991. In mid-1991, the City of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington, accepting waste from British Columbia, Idaho, and Oregon. Map C identifies the sources and amounts of waste that were imported and exported in 2004.

Map C: Imported and Exported Waste (2004)



As can be seen in Figure 6.5, 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 202,787 tons in 2004. This amount increased from the 122,884 tons in 2003. Exported waste amounts increased in 2004, with almost nine times as much waste being exported to Oregon's landfills, Columbia Ridge, Wasco and Finley Buttes, than is imported to Washington for incineration or disposal.

Figure 6.5
Trend of Imported/Exported Solid Waste



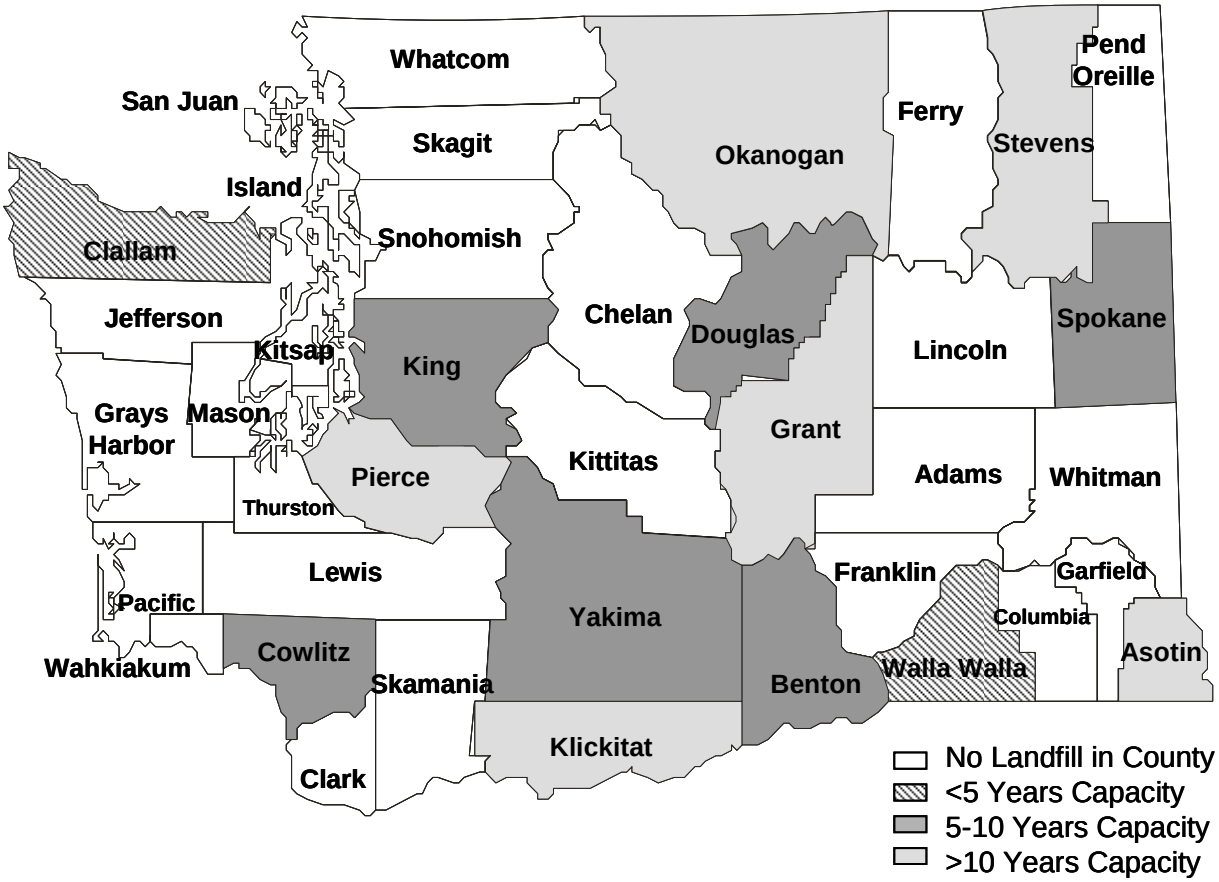
Future Capacity at Municipal Solid Waste Landfills

There are currently 16 municipal solid waste landfills operating as of September 2005. (See Map A for the location of operating MSW landfills and incinerators.) The amount of remaining capacity for the 16 MSW landfills was determined by asking the facilities to report remaining permitted capacity, as well as the expected closure date. In 2005, the facilities estimated about 219 million tons, or about 40 years, of capacity at the current disposal rate. Changes in permit conditions, early landfill closures and projections of fewer expansions, and changing volumes affect remaining capacity, which has fluctuated the past several years. Of the 16 currently operating landfills, thirteen have greater than five years of remaining permitted capacity. (See Table 6.11 for an estimated number of facilities with specified remaining years of life.) Map D shows the counties and the remaining years of capacity of their MSW landfills.

Table 6.11
Estimated Years to Closure for MSW Landfills

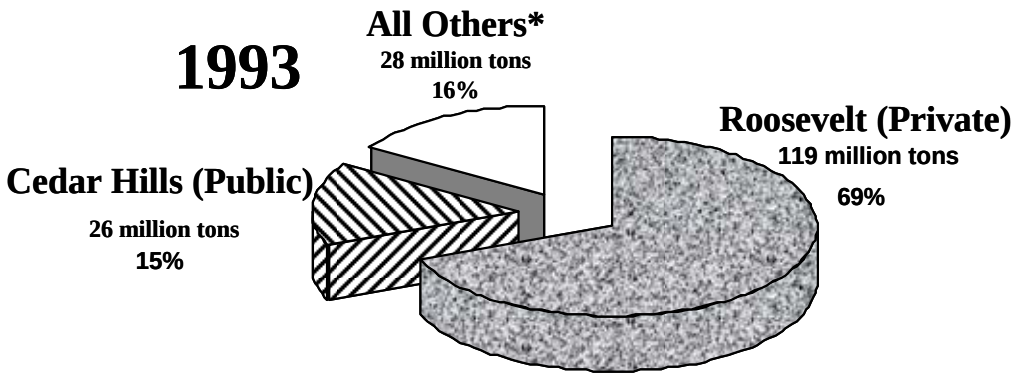
YEARS TO CLOSURE	% OF TOTAL REMAINING CAPACITY	NUMBER OF FACILITIES	PUBLIC	PRIVATE
Less than 5 years	1%	4	3	1
5 to 10 years	7%	8	7	1
Greater than 10 years	92%	6	4	2
TOTALS	100%	18	14	4

Map D: Remaining Permitted MSW Landfill Capacity
(as of April 2004)

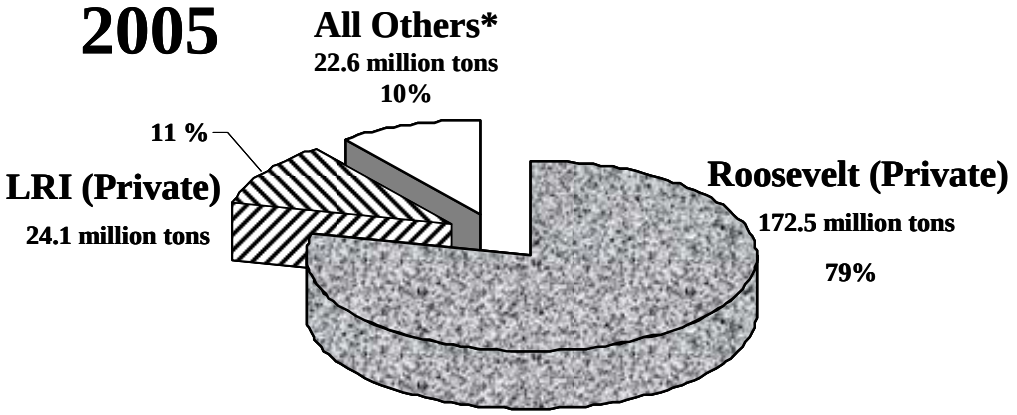


2005 capacity numbers indicated that 93% of the remaining capacity was at landfills with greater than 10 years to closure. Fourteen of the 16 operating MSW landfills are publicly owned with about 10% of the remaining capacity (22 million tons). About 90% of the remaining permitted capacity (197 million tons) is at the three privately-owned facilities, compared to 73% in 1993. The majority of the capacity, about 79% of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 11% of the statewide total capacity is at the LRI privately owned landfill in Pierce County, 5% at the publicly owned Cedar Hills landfill in King County, with the remaining 5% of capacity spread among the remaining 13 landfills in the state (see Figure 6.6).

Figure 6.6
Comparison of Remaining Permitted Capacity
1993 and 2005



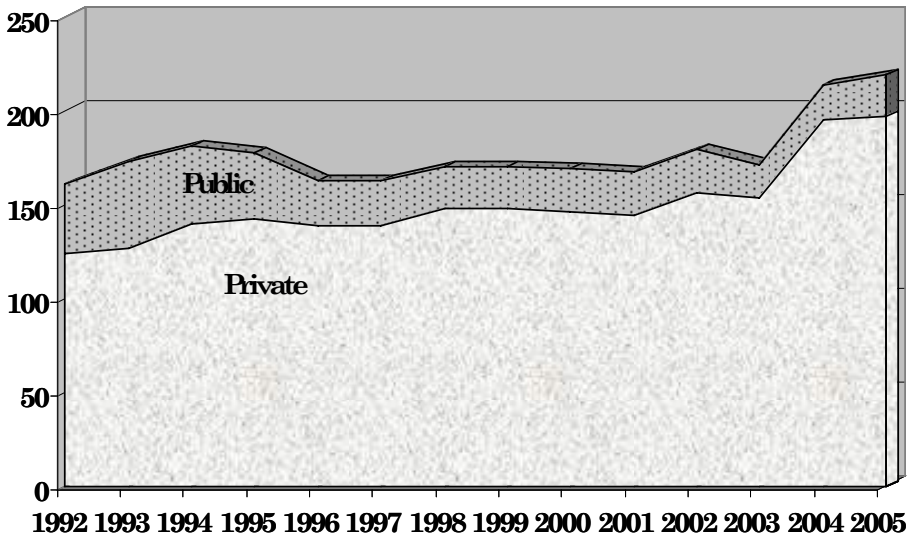
***All others includes public & Private**



***All others includes public & private**

The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992. (Figure 6.7).

Figure 6.7
Remaining Capacity MSW Landfills
(public/private in million tons)



Besides the amount of remaining capacity, the availability of that capacity needs to be considered. The Roosevelt Regional Landfill is operated to accept waste from a wide variety of locations (see Map B). In 2004, the facility received some type of solid waste from 30 counties in Washington, including the majority of the solid waste from twelve counties. Waste was also received from Alaska, Oregon, British Columbia and a small amount from California. For other counties that do not have landfills, Roosevelt or the Oregon landfills have become the disposal option. Other landfills in the state are operated to 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 the regional facility for some of their disposal needs. For other counties who have closed their landfills, Roosevelt or one of the three Oregon landfills have becomes the disposal option.

The 40 year estimate of total remaining permitted capacity is based on the amount of waste disposed in MSW landfills in 2004. This amount will vary depending upon waste reduction and recycling activities, population growth or decline, the economy, as well as the impact of waste being imported into the state for disposal or additional waste which is currently disposed out-of-state, being disposed in-state. As discussed previously, there has been an increase in the types of waste, other than municipal waste, being disposed of in MSW landfills. Part of this is the liability concern (that is, it is better to pay a higher cost and transport further to dispose in a well designed landfill). As requirements change for other

types of landfills in chapter 173-350 WAC, *Solid Waste Handling Standards*, some of those facilities may close and there will likely be an increase in the types and amounts of materials recycled, as well as a shift of the types of solid waste moving to the MSW landfills for disposal.

Chapter VII - Moderate Risk Waste Management

The term "Moderate Risk Waste" 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 considered waste that was generated in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from hazardous waste regulations.

MRW collections started in the early 1980's primarily as HHW-only events, also known as "round-ups".

These events usually transpired 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.

MRW FACTOIDS

- Total MRW collection in 2004 was over 37 million pounds.
- The average amount of HHW disposed per participant was 116.83 pounds, and per capita was 2.83 pounds.
- Over 3.8 percent of Washington residents used a fixed facility or collection event to remove hazardous waste from their household, however, this calculates to ten (10%) percent of all households.
- The counties that had the most CESQG waste per capita were Yakima, King, Grays Harbor, Asotin, and Whatcom.
- The counties that collected the most used oil per Housing Unit were Mason, Yakima, Skamania, Kittitas, Stevens, and Cowlitz.
- The four categories of waste type that increased the most in amounts collected from 2003 are Other, Flammable Solids, CRT's, and Electronics.
- Eighty-eight percent (88%) of all HHW was recycled or used for energy recovery.

Funding

The 1988 Model Toxics Control Act in Washington State provides a large part of the funding, through the Coordinated Prevention Grant (CPG) program for public MRW programs. Funds are used to meet the planning and implementation requirements for local hazardous waste MRW programs in each local jurisdiction.

By 1991 all local governments in the State of Washington had submitted MRW plans. Aspects included in every local MRW plan are 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 are required to provide individual MRW reports. Only one county failed to report for 2004.

Pend Orielle County did have a collection program during 2004. However, they failed to report their data. To maintain county and state accuracy, their 2003 data was carried over.

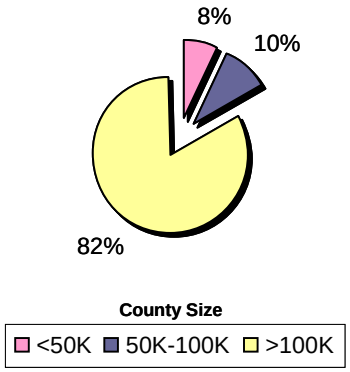
Lincoln County has experienced limited quantities and has stored their moderate risk waste, so they have limited HHW quantities, participation numbers, and costs to report. In addition, Klickitat County's participation number and Pacific County's HHW quantity number is suspect and has not been verified.

Year 2004 Data

This year's report focuses on 2004 data with some comparisons to the data published in previous year's 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 7.1 and Table 7.1 indicates a distinction between counties with a population of less than 50 thousand, 50 to 100 thousand, and populations greater than 100 thousand.

Figure 7.1
Percent of State Population by County Size



In Washington State there are 42 programs that manage MRW. These programs include all 39 counties. King County generates four reports:

- King County Waste Mobile and Used Oil Collection System
- Seattle Solid Waste Utility (HHW)
- Port of Seattle (HHW), and

- Seattle City Light (CESQG)

Many HHW collection systems are approaching stability. Most of the state is now serviced with permanent fixed facilities. Only Chelan, Clallam, Douglas, Ferry, Garfield, Grant, and Wahkiakum counties do not have fixed facilities. Garfield residents use the facility in Asotin County and Cowlitz County conducts a mobile unit in Wahkiakum County. Clallam, Chelan, Douglas, Grant, and Skamania counties conduct collection events but may convert to fixed facilities in the future. Clallam County has begun its planning stage for a new facility.

Collection services for CESQG's continue to expand statewide. For 2004, there are 18 fixed facilities and four collection events providing collection services for CESQG's.

Table 7.1
Individual County Population by Size

<50K	
Adams	16,596
Asotin	20,831
Columbia	4,187
Douglas	34,427
Ferry	7,565
Franklin	53,600
Garfield	2,311
Jefferson	28,110
Kittitas	35,721
Klickitat	19,855
Lincoln	10,412
Mason	53,637
Okanogan	39,444
Pacific	21,246
Pend Oreille	12,474
San Juan	15,190
Skamania	10,549
Stevens	41,310
Wahkiakum	3,755
Whitman	40,146
<50K total	**471,366**

50K-100K	
Chelan	67,987
Clallam	67,867
Cowlitz	96,189
Grant	79,981
Grays Harbor	70,338
Island	79,293
Lewis	71,539
Walla Walla	57,354
50K-100K total	**590,548**

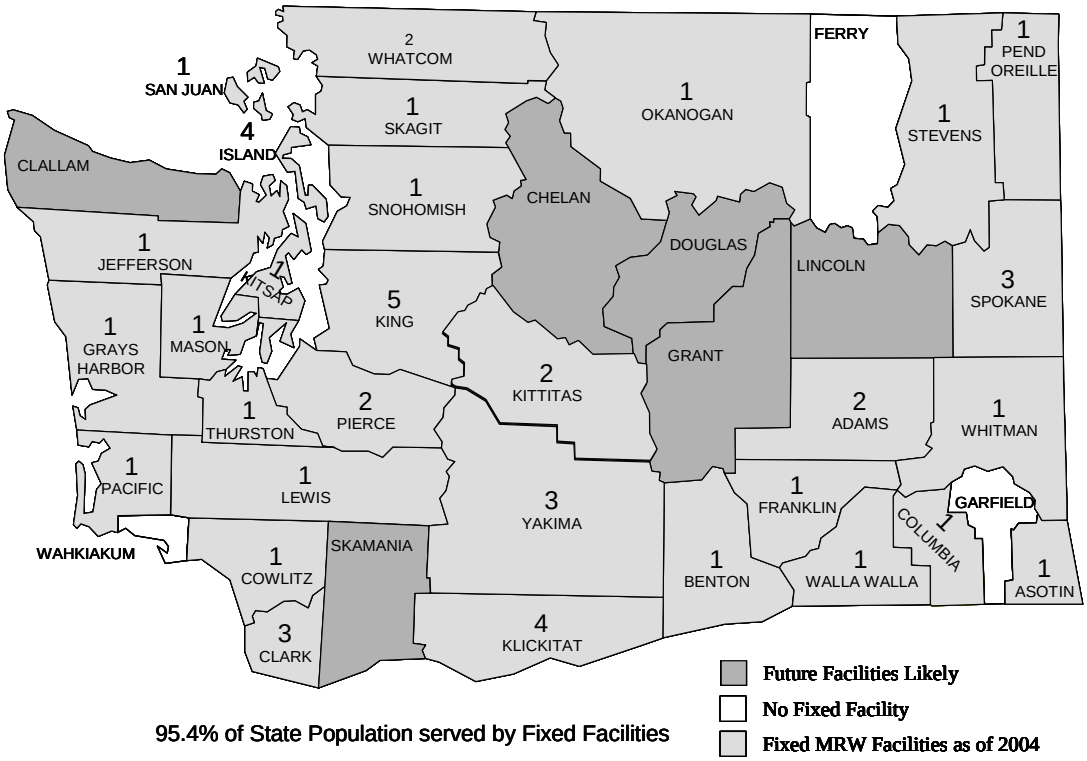
>100K	
Benton	155,991
Clark	392,403
King *****	1,207,400
Kitsap	239,138
Pierce	745,411
Skagit	111,064
Snohomish	644,274
Spokane	435,644
Thurston	224,673
Whatcom	180,167
Yakima	229,094
Seattle *****	571,900
>100K total	**5,137,159**

*** King excludes Seattle**

State Total 6,199,073

Figure 7.2 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 7.2
50 MRW Facilities as of 2004



MRW Collected

As shown in Table 7.2, Washington collected over 22 million pounds of HHW, 12.4 million pounds of used oil (UO) from collection sites, and over 2.4 million pounds of CESQG waste, for a total of over 37 million pounds of MRW during 2004. Both HHW and CESQG have increased from previous years. Most significant is the increase of CESQG, however, this is largely due to more accurate reporting from King County. This could increase much more if Pierce and Spokane counties started a program of collecting CESQG.

Table 7.2
Total Pounds per Waste Category for Years
1999, 2000, 2001, 2002, 2003 and 2004

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	22.3M	12.4M	2.4M	37.1M

Collection by Waste Category and Type

As shown in Table 7.3, the dominant types of MRW collected in 2004 were non-contaminated used oil, latex and oil-based paint, lead acid batteries, and flammable liquids. These totals include used oil collected at all collection sites. These five specific waste types accounted for 84% of the estimated 37.1 million pounds of MRW collected in 2004. These are the same top five HHW types as in since 1999.

Table 7.4 provides summary information on total pounds of MRW collected from HHW and CESQG categories by waste types.

Table 7.3
Six Dominant MRW Waste Types Collected in 2003

Waste Type	Total Lbs.
Oil Non-Contaminated	12,357,886
Latex Paint	8,620,880
Oil based Paint	5,007,478
Lead Acid Batteries	2,862,717
Flammable Liquids	2,417,101
TOTAL	**31,266,062**

Table 7.4
Total Pounds of MRW Collected by Waste Category

Waste Type	HHW	CESQG	Total
Electronic	406,529	5,771	412,300
CRT's	458,011	37,540	495,551
Chlorinated Solvents	9,012	1,051	10,063
Nicad / NIMH / Lithium	42,297	3,500	45,797
Dry Cell Batteries	234,955	5,641	240,596
Flammable Solids	321,678	11,880	333,558
Flammable Liquids	2,026,504	390,597	2,417,101
Flammable Liquids, Aerosols	40,179	6,090	46,269
Flammable Liquid Poison, Aerosols	9,866	324	10,190
Flammable Gas	243,170	2,507	245,677
Flammable Gas Poison	1,172	15,277	16,449
Flammable Gas Poison, Aerosols	77,342	2,353	79,695
Latex Paint	7,700,740	90,081	7,790,821
Latex Paint, Contaminated	830,059	0	830,059
Mercury	1,165	561	1,726

Waste Type	HHW	CESQG	TOTAL
Oil-Based Paint	4,773,298	234,180	5,007,478
Oil Contaminated	111,701	27,806	139,507
Oil Filters	91,167	1,101	92,268
Oil Filters Crushed	3,307	37,041	40,348
Oil Non-Contaminated	3,540,762	393,201	3,933,963
Oil Non-Contaminated Off-site *	8,423,923	0	8,423,923
Oil with Chlorides	2,013	0	2,013
Oil with PCBs	6,654	3,319	9.973
Other Dangerous Waste	426,634	1,252,662	1,679,296
Organic Peroxides	1,557	18	1,575
Oxidizers	47,664	2,477	50,141
Pesticide / Poison Liquid	545,999	31,732	577,731
Pesticide / Poison Solid	89,483	8,172	97,655
Reactives	4,257	1,156	5,413
MRW TOTAL	**34,227,243**	**2,806,765**	**37,034,008**

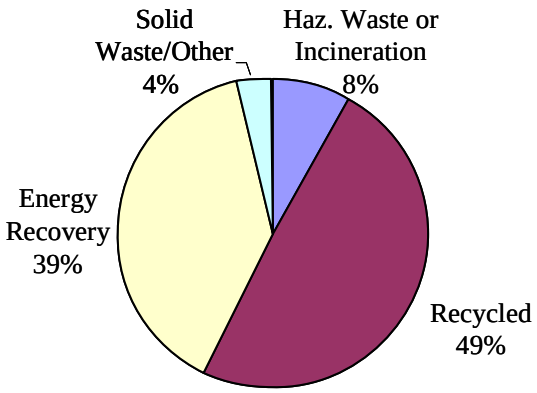
* Used oil collection sites other than a collection facility or event

Disposition of MRW Waste

The disposition of moderate risk waste is generally well managed. Most MRW is recycled or used for energy recovery. Very little is considered safe for solid waste disposal and only 8% of all HHW is disposed at a hazardous waste landfill or incinerator. See Figure 7.3 for final disposition of MRW between recycled, energy recovery, hazardous waste landfill or incineration, and solid waste disposal.

Figure 7.3

HHW Final Disposition



MRW Data

Table 7.5 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 lbs. per participant. Housing Units are the number of households in each county. This data is used instead of per capita because participants typically represent a household.

Table 7.5
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	6,020	350	6%	$20.61	22.5	7,875	41,205
Asotin	9,311	1,009	11%	$50.49	91.83	92,656	102,632
Benton	59,745	5,319	9%	$47.55	62.47	477,700	573,598
Chelan	31,429	613	2%	$105.40	87.78	70,987	161,370
Clallam	31,976	1,072	3%	$57.63	71.49	65,779	238,732
Clark	146,072	7,202	5%	$47.39	272.59	1,270,850	1,945,112
Columbia	2,096	3	1%	$236.33	36	108	8,248
Cowlitz	40,157	1,712	4%	$66.63	66.63	263,730	612,690
Douglas	13,517	425	3%	$60.63	82.35	32,171	93,663
Ferry	3,919	24	1%	$155.50	51.71	1,241	2,676
Franklin	17,776	179	1%	$57.50	69.25	12,396	147,520
Garfield	1,296	12	1%	$54.67	61.25	735	735
Grant	30,418	641	2%	$99.27	95.83	120,196	170,577
Grays Harbor	33,211	1,473	4%	$109.89	57.09	97,403	282,837
Island	34,452	2,926	8%	$59.11	77.90	238,744	435,930
Jefferson	14,965	1,197	8%	$46.35	42.90	60,008	129,613
King	494,530	63,078	13%	$48.38	179.79	11,340,494	15,354,207
Seattle	280,883	15,867	6%	$80.89	80.81	1,282,239	1,282,239

COUNTY	HOUSING UNITS	HHW Partici-pants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil Total lbs
Kitsap	96,635	5,938	6%	$100.90	124.06	595,473	1,111,691
Kittitas	17,385	783	5%	$161.54	296.21	231,934	273,084
Klickitat	9,138	8,888	97%	$5.30	8.8	78,230	128,661
Lewis	30,948	1,495	5%	$56.75	102.20	149,038	410,515
Lincoln	5,461	121	2%	$.29	47.3	5,723	5,723
Mason	26,842	4,176	16%	$24.56	10.98	112,733	809,089
Okanogan	19,733	369	2%	$99.64	206.04	22,144	49,185
Pacific	14,280	180	1%	$287.51	1,623	292,093	363,895
Pend Oreille	6,932	PNR	0%	CNR	28.27*****	43,928*****	62,865*****
Pierce	294,010	30,261	10%	$13.00	59.62	1,756,348	1,981,092
San Juan	10,519	286	3%	$.59	261.21	47,068	90,383
Skagit	44,946	2,895	6%	$50.20	137.14	397,027	568,016
Skamania	4,816	138	3%	$95.70	135.58	21,184	70,448
Snohomish	251,998	16,142	6%	$36.51	108.2	3,993,909	4,110,357
Spokane	182,298	34,201	19%	$7.28	26.6	1,066,777	1,710,577
Stevens	18,341	513	3%	$73.61	97.83	66,887	232,647
Thurston	91,543	10,375	11%	$41.07	74.43	592,601	1,050,363
Wahkiakum	1,869	39	2%	$42.51	28.83	1,124	10,604
Walla Walla	21,671	1,772	8%	$83.66	47.30	147,632	147,632
Whatcom	78,880	5,797	7%	$44.63	168.02	341,662	469,581
Whitman	17,176	3,330	19%	$12.13	27.66	60,764	60,764
Yakima	81,666	2,050	3%	$139.36	96.68	312,615	1,702,139
STATEWIDE	**2,578,860**	**208,791**	**8.4%**	**N/A**	**116.83**	**22,262,558**	**37,034,008**

PNR = Participants Not Reported

CNR = Costs Not Reported

* Pend Oreille County numbers are carried over from 2003

Household Hazardous Waste (HHW)

Participants Per Housing Unit

Counties that exhibit 10% or higher of participants per housing unit either are performing excellent public education to encourage the use of facilities or events, and/or have very convenient locations for their collection facilities. The participation number and rate for Klickitat County is suspect and could not be confirmed.

Cost Per Participant

This is a difficult statistic to compare because of the many variables in program costs. Some programs record every cost either 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 provide a vision 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 almost 117.

Table 7.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2002, 2003, and 2004. It is noteworthy that both King and Snohomish counties have large collections per capita. Pacific County collected 292,093 pounds of HHW with only 180 participants, which calculates out to an average collection of 1,623 pounds per participant, or 13.75 pounds per capita. Obviously, this number is suspect and could not be verified.

Table 7.6
High Collections of HHW (no UO Sites) Pounds Per Capita
by County in 2002-2004

HHW 2001		
County	**Size**	**Lbs./ Capita**
Island	50K-100K	9.04
Whatcom	>100K	5.25
San Juan	<50K	4.69
Yakima	>100K	4.46
Skagit	>100K	4.24

HHW 2002		
County	**Size**	**Lbs./ Capita**
Thurston	>100K	17.65
Kittitas	<50K	12.18
Whatcom	>100K	5.21
Klickitat	<50K	4.51
Cowlitz/ Skagit	>50K & >100K	4.44

HHW 2003		
County	**Size**	**Lbs./ Capita**
Pacific	<50K	13.75
King	<100K	9.39
Kittitas	<50K	6.49
Snohomish	<100K	6.20
Asotin	<50K	4.45

Conditionally Exempt Small Quantity Generator (CESQG)

There are 22 local MRW programs that collect CESQG waste from the public. Counties that sponsor CESQG waste collections are:

Asotin	Cowlitz	Jefferson	Skamania
Benton	Douglas	King	Snohomish
Chelan	Grant	Kitsap	Thurston
Clallam	Grays Harbor	Kittitas	Whatcom
Clark	Island	Skagit	Yakima

Also included in CESQG waste totals for year 2004 are data from Philip Services. Philip Services primarily serves CESQG's in three counties:

King Pierce Clark

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

Yakima Whatcom Grays Harbor Asotin Cowlitz

Yakima County collected over 49% of the total statewide volume of CESQG waste. This is largely due to Yakima County's policy of not charging businesses to dispose or recycle their waste.

As shown in Table 7.7 (discounting the waste type "Other Dangerous Wastes") the dominant four types of CESQG waste collected in 2003 were non-contaminated oil, flammable liquids, oil based paint, and antifreeze. Forty-eight (48%) percent of all CESQG moderate risk waste was either recycled or used for energy recovery. Only 4% was incinerated or sent to a hazardous waste landfill.

Table 7.7
CESQG by Waste Type Collected in 2003(top 25 types)

Waste Type	Total lbs. CESQG
Oil Non-Contaminated	392,961
Flammable Liquids	390,597
Oil based Paint	234,180
Antifreeze	135,045
Latex Paint	90,081
CRT's	37,540
Oil Filters	37,041
Bases	32,839
Pesticide/Poison Liquid	31,732
Acids	30,120
Lead-Acid Batteries	28,072
Oil-based paint, Contaminated	27,806
Flammable Gas Poison	15,277

Waste Type	Total lbs. CESQG
Flammable Liquids Poison	14,887
Flammable Solids	11,880
Reactives	8,172
Flammable Liquid Aerosols	6,090
Electronic	5,771
Batteries, Dry Cell	4,056
Nicad / NIMH / Lithium Batteries	3,500
PCB Oils	3,319
Flammable Gas	2,507
Oxidizers	2,477
Flammable Gas Poison, Aerosols	2,353
Reactives	1,156
All Other	1,252,662
TOTALS	**2,806,766**

Used Oil Sites

In 2004, total reported used oil collection at facilities and collection sites yielded 12,357,886 pounds. Used oil collection by county population is starting to show consistency with the top

producers over the last few years. See Table 7.8 for the six counties with the highest collections in pounds per capita by county size for 2002, 2003 and 2004.

Table 7.8
Used–Oil High Collection Counties,
pounds per capita by county size
collected at Facilities and used oil collection sites

Used Oil Sites - 2002		
County	**Size**	**Lbs./ Capita**
Columbia	<50K	17.6
Adams	<50K	12.3
Stevens	<50K	4
Skamania	<50K	3.9
Pacific	<50K	3.8
Kittitas	50K-100K	3.6

Used Oil Sites - 2003		
County	**Size**	**Lbs./ Capita**
Columbia	<50K	17.6
Mason	50K-100K	11.9
Skamania	<50K	5.6
San Juan	<50K	4.9
Stevens	<50K	3.8
Pacific	<50K	3.8

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

Statewide Level of Service

The US Census Bureau reports that as of 2004 there were an estimated 2,579,311 Housing Units[37] in Washington State. MRW Annual Reports revealed there were 234,052 participants. Only Columbia and Pend Oreille counties did not provide participation numbers at their facilities or collection events. 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 (Spokane is the exception). The actual number of households served is larger also because some participants counted at events or by facilities bring HHW from multiple households. The actual number of households served can be estimated by adding 10% to the participant values for an estimated 257,457 households served in 2004. This number represents 10% of all households in Washington State. This is an increase from the 8.9%, 6.8%, and 6.1% of 2003, 2002, and 2001 respectively, and also an increase from 2000 and 2001 when an estimated 7.8% and 6.6% respectively of Washington households were served.

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 using hybrid mobile collection systems. 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, and increased operation efficiencies with fixed facilities including the option of having an efficient location to conduct a collection service for CESQG's.

[37] This information was downloaded from Website http://quickfacts.census.gov/hunits/states/53cty.html

New Waste Streams

MRW collection programs are well established statewide. Although the 2004 annual reports did not identify any new waste types, "Other" became the highest quantity waste type indicating a need to identify what wastes are not fitting into the established categories on the report.

Used electronics continues to be an area of concern. Components in a number of electrical and electronic products are known to contain one or more of the following substances: mercury, lead, cadmium, embedded batteries, and polychlorinated biphenyls (PCBs).

Improved technology leads to better electronic products. And as more people become financially able to obtain these popular commodities, disposal of the leftovers as well as their components becomes a concern for the Department of Ecology and local solid waste managers. For example, in the European Union an estimated four percent of their municipal solid waste stream is electronics, other electrical devices, and appliances as of 1999.

Ecology began collecting data on this waste stream in 2001, and in one year (2002 vs. 2003) it more than doubled. In 2004 it has more than tripled over 2003 totals. In 2003, electronics and CRT's were the 16th highest quantity waste type. In 2004 that status moved up to 6th. This report shows a significant shift of electronic and CRT's collection came from households instead of from businesses, as reported in 2003. We expect this waste stream to increase as more attention to this waste type filters down to the public.

Annual Reporting

Local programs are required 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. This data is translated into the information contained in this chapter and is specifically designed to be useful to those who operate or work MRW programs within Washington State.