Solid Waste In Washington

Thirteenth Annual Status Report

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Solid Waste and Financial Assistance Program
December 2004
Publication #04-07-018

Solid Waste in Washington State

Thirteenth Annual Status Report

Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

December 2004
Publication No. 04-07-018

printed on recycled paper

This report and the supporting database information can be accessed at:
http://www.ecy.wa.gov/programs/swfa/index.html
Or for additional copies of this document, contact:

Department of Ecology
Publications Distribution Center
PO Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-7472

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 eleventh 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:

Headquarters

Jim Bill
Suzanne Crouch
Kristen Dorwin
Anna Lewis
Lydia Lindwall
Steve Loftness
Randy Martin
Gretchen Newman
Michelle Payne
Kathy Seel
Jay Shepard
Cheryl Smith
Megan Warfield
Holly Wescott

Central Regional Office

Kip Eagles
Sage Park

Eastern Regional Office

Marni Solheim
Jim Wavada

Northwest Regional Office

Peter Christiansen
Emma Johnson

Southwest Regional Office

Mike Drumright
Chuck Matthews
Shelly McClure
Tami Morgan Ramsey
Paige Sorensen

Graphics and Word Processing: ***Shelly Smith, CRO***

Final Document Preparation: ***Sonya Kirkendall, Text Processing***

The Solid Waste and Financial Assistance Program would also like to thank the many Recycling Coordinators in the counties who assisted Gretchen Newman with the preparation of the 2003 Recycling Survey.

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 including the recently completed "Beyond Waste Plan."

The remaining chapters of the annual report discuss the solid waste infrastructure in the state, partnering for the environment through grants to local governments and efforts on specific waste streams, litter collection efforts, the 2003 statewide recycling survey results, information on waste disposal and moderate risk waste. Some of the data is for 2003 (recycling and disposal information), while other data is current to late 2004 (litter pickup numbers and facility status). A brief summary of significant information is highlighted below.

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:

  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).

Recycling

- The 2003 recycling rate increased slightly to 38% from 35% in 2002. 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 and nonferrous metals 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 a recycling rate parallel to the traditional one. This "alternative" recycling rate 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 sources as well as woodwaste, inert/demolition and limited purpose landfills. For 2003, this "alternative" recycling rate was 47%, and increase from 45% in 2002.

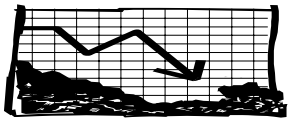
Litter Collection Efforts

- For July 2003 - June 2004, litter collection efforts by Ecology Youth Corps (EYC) picked up a total of 1,026,923 pounds of litter over a total of 4,403 road miles and 331 acres. This is the equivalent of 513 tons of litter. Eight percent or 40.3 tons of litter were recycled.

- Other state agency programs were coordinated by SW&FAP. From July 2003 – June 2004, 569,572 pounds of litter and illegally dumped materials were collected by Departments of Corrections and Natural Resources.

- The Community Litter Cleanup Program provides funds to local governments through contracts for local litter collection programs. Now in its fifth cycle (July 2003 – June 2004) local governments are again partnering with volunteer groups and are working with state and local offender crews. For the first half of the fifth cycle (July 2003- June 2004), 27,701 road miles and 4,689 illegal dump sites were cleaned. A total of 4,532,249 pounds of litter and illegally dumped materials were collected, of which 331,784 pounds were recycled.

Partnering for the Environment



- Ecology provided over $17.3 million in Coordinated Prevention Grants to local governments for the 2002/03 cycle (January 2004 – December 2005). These funds leveraged local matching funds to support over $23 million worth of solid and moderate risk waste projects.

- Ecology continues efforts with the building industry and local governments to promote a sustainable design and construction, a movement commonly referred to as "green building." At the state level Ecology staff continued work the General Administration (GA), the Office of Superintendent of Public Construction, several local governments, industry association representatives, and private sector partners to develop incentives for green building.

- Organics continue to be a focus waste stream with efforts using compost and organic mulches to reduce soil erosion control and protect water quality. Technical assistance is being provided to the Department of Corrections and The Evergreen State College to set up on-site composting facilities. Ecology's headquarters building in Olympia is moving forward with a food waste and paper towel composting system.

- Efforts with local governments and other partners is focusing on emerging problem waste streams including 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 $21,000 to 21schools that embraced the sustainability principles in one of three categories: Seed Award, Environmental Curriculum Award, and Sustainable School Award.

Disposal of Solid Waste

- In 2003, 19 municipal solid waste landfills accepted 4,572,275 tons of waste. One of these landfills is no longer accepting MSW and was scheduled to close in 2004.

- The total amount of waste disposed in all categories of Washington state landfills and incinerators decreased slightly from 6,171,407 tons in 2002 to 5,973,325 tons in 2003.

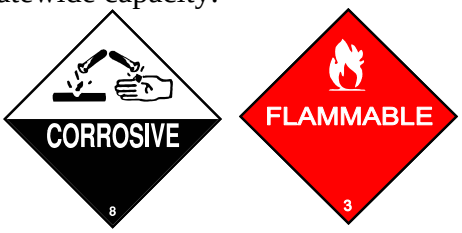
- Currently 14 of Washington's 39 counties have an operating municipal solid waste landfill. Most counties without their own municipal solid waste landfills have long-haul contracts to either Roosevelt Regional Landfill in Klickitat County or one of three landfills in Oregon.

- Three incinerators burned 303,978 tons of waste in 2003, accounting for 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 decreased in 2003 to 122,884 tons from 165,935 tons in 2002. Exported waste increased in 2003 to 1,515,532 from 1,425,248 tons

in 2002, with almost twelve times as much waste exported as imported. The imported waste accounts for less than 3% of the solid waste disposed and incinerated in Washington.

- The 18 operating municipal solid waste landfills reported in April 2004 a statewide permitted landfill capacity of 214 million tons, or approximately 47years at the current rate of disposal. The majority of that permitted capacity (91%) is at private landfills, with Roosevelt Regional Landfill in Klickitat County accounting for 81% 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 2003.

- In 2003, Washington collected over 16 million pounds of household hazardous waste (HHW), almost 11.7 million pounds of used oil (UO), and over 1.3 million pounds of conditionally exempt small quantity generator (CESQG) waste, for a total of nearly 29.0 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 I
Issues Facing Solid Waste

The Department of Ecology (Ecology) has completed a collaborative effort to revise the state solid waste plan pursuant to state law (RCW 70.95.260). The plan has been revised in concert with the state hazardous waste plan revision (pursuant to RCW 70.105.010). The combined Beyond Waste Plan[1], completed in November 2004, is one of Ecology's top priorities, as it sets a new vision for the future of both solid waste and hazardous waste management in Washington. We are excited to move into the implementation phase, where we are beginning to work with many different partners to carry out coordinated strategies to move toward this vision.

Beyond Waste--The State Solid Waste Strategic Plan

The goal of the Beyond Waste Plan is to help our state transition from managing wastes and toxic substances to preventing them from being used and generated in the first place. Viewing waste materials as resources with value is one of the keys to making this transition. The other is seeking ways to redesign processes and products so less toxic substances can be used, less materials and resources are used, and less pollution occurs.

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

The result is that Beyond Waste will serve as one of the important approach to ensure a good quality of life for people in Washington. This expectation is based on the premise that using fewer resources, having fewer wastes to manage, and using fewer and less toxic substances will reduce threats to human health and our natural resources, while at the same time strengthening our economy and invigorating our communities for all of the people who live here.

The Beyond Waste Plan is not just an initiative for Ecology; the success of eliminating waste and uses of toxic materials, and their impacts lies in partnerships between all sectors and types of organizations. Ecology views one of its important roles to be the fostering of collaborations, as well as leading in the implementation of many of the plan's recommendations. In some cases, other organizations may be willing and better suited to serve as leaders.

[1] To view the final plan and additional supporting documents, please see http://www.ecy.wa.gov/beyondwaste/finalplan.html.

For this collaboration to be successful, it is very important for Ecology to encourage people to be involved and engaged in the project.[2]

The Beyond Waste Plan lays out the strategy and actions need to work toward this preferred future, while at the same time maintaining the excellent solid waste management system that already serves Washington's households and businesses. Over the years, Washington's government, businesses and citizens have put considerable effort into making positive changes in waste management practices. The present solid waste system in Washington is remarkably successful in many ways. This success is due to the people involved and the relationships they have developed over the years. Yet problems still remain. Solid waste generation is increasing, but recycling rates are lower than 10 years ago. Toxic substances remain prevalent in our environment as evidenced by mercury in fish, polychlorinated biphenyls (PCBs) in orcas, and the flame-retardant polybrominated diphenyl ether (PBDE) in human breast milk.

In spite of these documented dangers, many people perceive that the existing waste management system is taking care of all of our waste-related problems. This perception is generally founded on one (or more) of five misconceptions about the current hazardous waste management system, solid waste management system, or toxic materials in general. One or more of these misconceptions can foster a false impression that everything needed to protect the people and the environment of Washington from hazardous materials, solid wastes, and hazardous wastes is being done now. These misconceptions are:

- Existing laws and regulations provide adequate protection from toxic chemicals.
- If a product is on the shelf, it is safe.
- Landfills solve the waste problem.
- Recycling solves the waste problem.
- Eliminating waste and toxic materials will be bad for the economy.

Hand in hand with these misconceptions goes the fact that most of our society's waste is never seen "in public." Rather, it results from resource extraction, energy production, product manufacturing, and transportation. By these activities, most of the wastes associated with a product are generated before consumers ever see the product or its packaging. According to some estimates, this pre-consumer waste stream could be as much as 15 to 20 times as large as the smaller waste stream that shows up in residential and commercial recycle bins or garbage cans.

[2] If you would like more information, please visit our Web site (http://www.ecy.wa.gov/beyondwaste/). It can direct you to people working on specific issues in the plan implementation.

Key Principles and Strategies of the Beyond Waste Plan

The Beyond Waste Plan is based on a number of key principles and strategies:

1. Incentives are key tools in implementing Beyond Waste.
2. Achieving the Beyond Waste goal will require a different way of doing business.
3. Increasing the focus on waste prevention by eliminating toxic substances wherever possible.
4. Choosing activities that create the least damaging ecological footprint.
5. Changing our mindset from the idea that waste is "normal" or "necessary."
6. Encouraging designers and manufacturers to develop product lines that are least toxic, reusable, highly recyclable, use the least materials, generate the least wastes, and that also conserve energy and water.
7. Expanding partnerships among government, business, organizations, and citizen groups from every sector across the state are crucial to decision-making and achieving the Beyond Waste goals.
8. Ensuring the actions in each initiative should also advance the goals of other key initiatives.
9. Measuring progress regularly will allow course corrections when needed to meet the goals.
10. Using state government leadership as an important lever to make progress toward the goals.
11. Building on and increase existing momentum toward waste reduction and toxic substance elimination.
12. Using pilot projects to test feasibility and gain support.
13. Removing barriers that stand in the way of reducing wastes and use of toxics.
14. Building on Environmental Justice efforts to ensure that those risks that cannot be eliminated are borne equitably by all sectors of our society.

Key Beyond Waste Initiatives for the First Five Years

Reducing wastes, toxic substances, and their impacts is important for our state's future. The Beyond Waste Plan proposes a set of five initiatives to significantly reduce waste and toxic materials. Each initiative has recommendations that may be affected by the actions proposed in other initiatives, but all recommendations are intended to complement and support the actions and goals of all five initiatives.

From a larger list of five-year recommendations in the Plan, the list below identifies the more specific actions that will serve as starting points during the first year. Selection of these starting points was made based on a number of factors, including readiness to proceed, appropriate sequencing of actions, availability of resources, and likelihood of partners to collaborate on implementation.[3]

Major Initiatives of Beyond Waste

- 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).

Eliminating industrial wastes from targeted sectors

- Focusing Ecology's hazardous waste and toxic substance use reduction efforts on businesses in selected industry sectors. Focused efforts and partnerships with industry sectors will encourage hazardous waste generators to make changes that will lead to significant environmental protection and will result in sustainable industrial practices.

- Focusing on specific sectors including the metal-finishing sector; mercury-related issues with auto switches and lights and in hospitals; sectors that are consistent with Ecology's next chemical action plan, which is PBDE, a class of flame-retardants; the general government sector. Other industries and institutions being considered include hospitals, colleges and universities, auto recyclers, and industries that produce or use lead, greenhouse gases, biodiesel, used oil, polyvinyl chloride (PVC) plastics or solvents, and/or construction and demolition wastes.

- Developing a standardized process to clarify and guide how sectors will be selected in the future and how sector work will be conducted.

- Modifying the Pollution Prevention Planning Program to dovetail with the Beyond Waste vision.

- Expanding information on Ecology's web site to include more detailed information on specific waste streams and processes, emphasizing best management practices and multimedia approaches.

[3] The Beyond Waste Implementation Plan, Publication Number 04-07-034, is available at http://www.ecy.wa.gov/biblio/0407034.html.

- Negotiating state agreement with EPA to focus more on meeting the Beyond Waste Plan goals, including sector work.

- Exploring ways to implement financial and regulatory incentives and approaches to encourage hazardous waste generators to adopt Beyond Waste behaviors.

- Supporting EPA's "Beyond Waste-type" efforts: the Beyond RCRA plan, Resource Conservation Challenge, Performance Track, Waste Minimization Partnership Program, and innovation in permitting and compliance assistance.

Establishing a viable closed-loop reuse and recycling system for capturing organic materials

- Leading by example in state government both through organics recovery programs as well as through the purchase and use of more recycled organic products.

- Increasing residential and commercial organics recovery programs.

- Developing a strategy to increase industrial and agricultural organics recovery.

Encouraging a green-built environment by making sustainable building the norm in Washington

- Coordinating and facilitating partnerships to implement the green building action plan by establishing a lead organization to promote these efforts and to coordinate their statewide implementation. This effort includes working with partners to develop cost-effective programs, tools, and techniques to encourage green building.

- Leading by example in state government by building or renovating all state-funded buildings to Leadership in Energy and Environmental Design (LEED™) standards, or equivalent standards, for projects entering into pre-design in the 2005-07 biennium and after. Adapting state government procurement processes to ensure purchase of green building materials. Participating in established processes to ensure that green building standards continuously improve as new technologies and issues emerge, and to address concerns that arise.

- Providing incentives that encourage green design, construction, and deconstruction and begin removing disincentives. Researching, assessing and begin instituting incentives that will increase green building demand and participation. Identifying and beginning to remove regulatory barriers and other disincentives that serve to discourage green building practices.

- Provide and promote statewide residential green building programs.

- Work with leaders of existing residential green building programs to make the programs available throughout the state for local implementation.

- Provide and market available support, including but not limited to technical assistance, promotional materials and checklists.

- Increasing awareness, knowledge and access to green building resources by promoting the expansion of green building practices statewide through raising awareness, and teaching green design and green building. Specific actions include:
    - A comprehensive information clearinghouse,
    - Technical assistance centers,
    - Industry-specific training, and
    - A marketing effort aimed at consumers and the building professions.

- Encouraging innovative product design by working with partners to achieve manufacturer commitment to innovative product design and life-cycle management. Focusing first on product stewardship programs for carpet, paint, and mercury-containing building products. Supporting and actively participating in efforts to increase the availability of green building materials that consumers can feel confident in using.

Tracking overall progress toward the Beyond Waste vision through performance measures and improved data tracking

- Continuing the work of Ecology's data team to produce a joint Beyond Waste progress report. Modifying Ecology's existing data-collection system to be more comprehensive and to be more in line with a materials flow framework system. One of the tasks of this group will be to produce a joint Hazardous Waste and Toxics Reduction (HWTR) and Solid Waste & Financial Assistance (SWFA) Program Beyond Waste progress report annually or every other year, starting in 2006.

- Discussing the implementation of the indicators for each initiative in the joint Beyond Waste progress report (unless otherwise noted).

Reducing and preventing moderate risk waste (small amounts of hazardous wastes from households and businesses)

- Prioritizing substances to pursue by developing a prioritized approach to identifying and eliminating MRW hazards that enter the municipal waste stream. Through collaboration with businesses and other organizations, establishing a science-based process to identify hazardous substances that are high-risk and have potential widespread environmental threats.

- Reducing and eliminating threats from mercury by supporting and implementing the Washington State Mercury Chemical Action Plan (WSMCAP). WSMCAP, part of a statewide long-term strategy for eliminating persistent bioaccumulative toxins, or PBTs, includes actions to decrease mercury from all sources. Some significant sources of mercury are in the moderate-risk waste arena, and addressing these is crucial to the success of the overall action plan. Specific actions that support the goals of the WSMCAP include technical assistance to businesses; education to businesses, households and schools; and supporting a mercury collection, repository, and recycling infrastructure.

- Reducing threats from PBDEs by participating in and supporting development of the statewide chemical action plan to reduce threats posed by flame-retardants called polybrominated diphenyl ethers (PBDE), found in products ranging from textiles to computers. Assisting with implementing this plan as it relates to the moderate-risk waste stream.

- Developing an electronics product stewardship infrastructure in consultation from the State Solid Waste Advisory Committee (SWAC) and others. Ecology researching and developing recommendations to the state legislature for an electronic product collection, recycling, and reuse program (pursuant to ESHB 2488, adopted in 2004).

- Reducing and managing all architectural paint wastes by working with industry, establish a regional or national product stewardship infrastructure for architectural paints and coatings, including a manufacturer take-back network. Also working to reduce architectural paint wastes and the use of toxics in such paints.

- Leading by example in state government by reducing the use and purchase of hazardous products and services by developing and implementing environmentally preferred purchasing (EPP) policies and practices for six priority areas.

- Ensuring MRW and hazardous substances are managed according to hazards, toxicity, and risk. Developing a long-term approach to evaluate and, if needed, modify environmental laws and regulations that govern MRW.

- Fully implementing local hazardous waste plans. Ensuring that all local jurisdictions have and continue to fully implement the five required elements of local hazardous waste plans.

- Ensuring facilities handling MRW are in compliance with environmental laws and regulations encouraging as much reuse and recycling of these materials as possible. This recommendation also involves evaluating the existing compliance strategy, and creating a plan for strengthening it.

Current Solid Waste System Issues

While the Beyond Waste Plan is a very forward-looking plan, it also brings attention to some current problems and situations that we must face now. Local governments and Ecology all recognize that maintaining current solid waste facilities and services is necessary in the more immediate future. Recommendations for addressing current solid waste system issues focus in the following four areas.

Solid waste authorities and local planning issues

- Encouraging local government planning jurisdictions to incorporate Beyond Waste principles and actions into their local Comprehensive Solid Waste Management Plans.

- Expanding planning assistance to local government jurisdictions.

- Collaborating with local governments to strategically use grant funding to encourage Beyond Waste priority activities.

- Ensuring that roles and responsibilities for solid waste planning and implementation are clear and are aligned with Beyond Waste principles.

Recycling and the technical nutrient cycle

- Updating the characterization of the state's solid waste streams to better understand and anticipate future opportunities for recycling.

- Developing a strategy for strengthening the recycling system, especially for materials like paper. The eventual aim is to design products to be reused and recycled in a technical closed-loop cycle (manufacture, reuse and recovery).

Disposal--Yesterday, today and tomorrow

- Inventory, prioritize and begin addressing problems at closed and abandoned municipal landfills and dumps.

- Ensuring that existing disposal facilities comply with requirements.

- Continually reducing disposal impacts on human health and the environment over time.

Financing solid waste for the future

- Evaluating financing for the solid waste system, including moving toward Beyond Waste, in consultation with the state Solid Waste Advisory Committee (SWAC) and interested parties.

Current Hazardous Waste System Issues

Several current hazardous waste management issues are also addressed in the Beyond Waste plan. They include recommendations in the following areas:

- Enhancing the effectiveness of the Pollution Prevention Planning program for hazardous waste generators.
- Promoting safe recycling of hazardous waste and ensuring compliance with the *Dangerous Waste Regulations.*

- Ensuring that hazardous waste management facilities are safely and adequately operated, cleaned up and closed.

Moving "Beyond Waste"

Ecology is committed to successful implementation of Beyond Waste through continuing to gain support for the project and also by aligning resources and priorities with the implementation priorities. While we recognize the challenges of carrying out new activities while properly managing the management system we enjoy today, we also recognize that it is essential for our collective future to begin moving "Beyond Waste."

Chapter II
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 2004. For the purposes of this annual report, the classifications found in the *MFS* are used. 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 will not exist under the new regulation. There have been no changes to the municipal solid waste landfill or ash monofill requirements. Table 2.1 identifies the applicable regulatory citation for various solid waste facility types.

Table 2.1 Regulatory Requirements for Solid Waste Facilities

Facility Type under *chapter 173-304 WAC*	Where found under *chapter 173-350 WAC*
Ash Monofill	Under chapter 173-306 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 2004, Ecology has identified 636 solid waste handling facilities in Table 2.2. In addition to permitted facilities under *chapter 173-350 WAC, Solid Waste Handling Standards*, there are requirements for facilities that are exempt from permitting, if they meet certain conditions, one of which is filing an annual report. 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.

Table 2.2
Facility Types Statewide

Facility Type	Statewide Total
Ash Monofill	1
Municipal Solid Waste Landfills	19*
Inert/Demolition Waste Landfills	33
Limited Purpose Landfills	15
Woodwaste Landfills	3
Composting Facilities (permitted)	43
Composting Facilities (exempt)	3
Recycling Processors (exempt)	87
Intermediate Recycling Facilities (exempt)	126
Intermediate Recycling Facilities (permitted)	36
Recycling Facilities - Land Application	13
Landspreading Disposal Facilities	13
Energy Recovery and Incineration Facilities	4
Compacting Stations	3
Drop Boxes	60
Transfer Stations	98
Piles	18
Surface Impoundments	5
Tire Piles	2
Moderate Risk Waste Handling Facilities	49
Other	5
TOTAL ALL FACILITIES	**636**

Facility ownership in this chapter is categorized as either PUBLIC for those facilities owned by a recognized jurisdiction of government – a city, county or special purpose district – or as PRIVATE, for those facilities owned by corporation, partnerships or private individuals. Table 2.3 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 and in most cases the breakdown between public and private ownership.

Table 2.3
Solid Waste Facilities in Washington
(as of September 2004)

County	MSW Landfill	Wood Waste	Inert/Demolition	Limited Purpose	Ash Monofill	Compacting Station	Compost Facility	Drop Boxes	Pile Facility	Recycling Facility	Surface Impoundments	Landspreading	Land Application	Transfer Stations	Tire Piles	Energy Recovery	MRW Facilities	Other
Adams							1			1			2	2			1	
Asotin	1		2														1	
Benton	1		2					1		11		1		6	1		1	1
Chelan			3				1			6				4				
Clallam	1			1			1			5				2				
Clark				2			2			7				2			3	1
Columbia							1						1	1			1	
Cowlitz	1			1			1	1		3				1			1	
Douglas	1		2							3		1		1				
Ferry										1				1				
Franklin	1						1		1	8			1	1			1	
Garfield														1				
Grant	2			1			1	13	1	7			6					
Grays Harbor		1	1						1	6	1		2	6			1	
Island						2	1			6	1			3			4	
Jefferson			1	1			2	1		5				1			1	
King	1		1				6	2		45				13			5	
Kitsap							1	5		5				1			1	
Kittitas			1							4	1			2			2	
Klickitat	1				1			2		1				3	1		4	
Lewis				1			1	6		3		9		3			1	

CONTINUED - Table 2.3
Solid Waste Facilities in Washington *(as of September 2004)*

County	MSW Landfill	Wood Waste	Inert/Demolition	Limited Purpose	Ash Monofill	Compacting Station	Compost Facility	Drop Boxes	Pile Facility	Recycling Facility	Surface Impoundments	Landspreading	Land Application	Transfer Stations	Tire Piles	Energy Recovery Incinerators	MRW Facilities	Other
Lincoln														1			1	
Mason				1			2	3		10				1			1	
Okanogan	1									3				2			1	
Pacific								2		1				3			1	
Pend Oreille														3			1	
Pierce	2		1	3			5	1	9	36		1		11			1	2
San Juan								1		1				2			1	
Skagit			1			1	5			8	2			2			1	
Skamania										1				3				
Snohomish	1*	2	1				5	6		24				3			1	1
Spokane	1		7	1			1		1	31			1	4			3	
Stevens	1			1					1	2				4			1	
Thurston							2	3		9				1			1	
Wahkiakum								1		1								
Walla Walla	1		1				2		1	3							1	
Whatcom			1	1			2	7	1	22				3			2	
Whitman			4	1			1			2				1			1	
Yakima	2		4				1	5	2	14		1					3	1
Total	**19***	**3**	**33**	**15**	**1**	**3**	**46**	**60**	**18**	**295**	**5**	**13**	**13**	**98**	**2**	**4**	**49**	**5**






* The MSW landfill in Snohomish County is permitted but not opened.

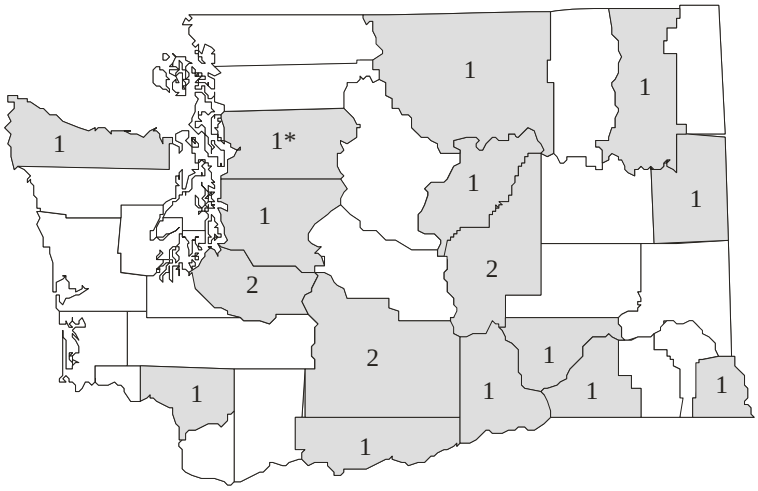
Municipal Solid Waste Landfills

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, 19 operating MSW landfills accepted 4,572,275 tons of waste. (See Chapter VI for additional discussion of waste types, amounts and sources.)

In 2004, of the remaining 18 operating landfills, the majority, 72%, are operated by public entities. This has historically been true in Washington. However, while privately owned landfills comprise only 28% of the facility type, they control over 91% of the remaining capacity.

Location of MSW Landfills



Public	14
Private	5
Total	19*

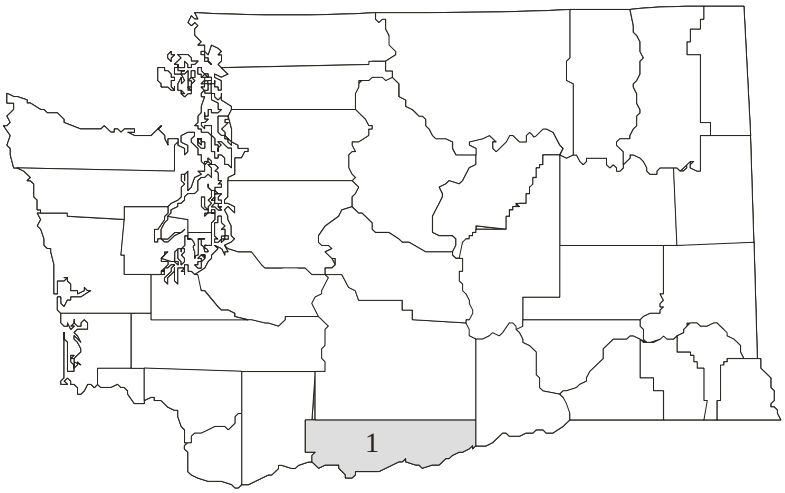
* The MSW landfill in Snohomish County is permitted but not opened.

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 2004, 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 76,262 tons of special incinerator ash in 2003.

Location of Ash Monofill



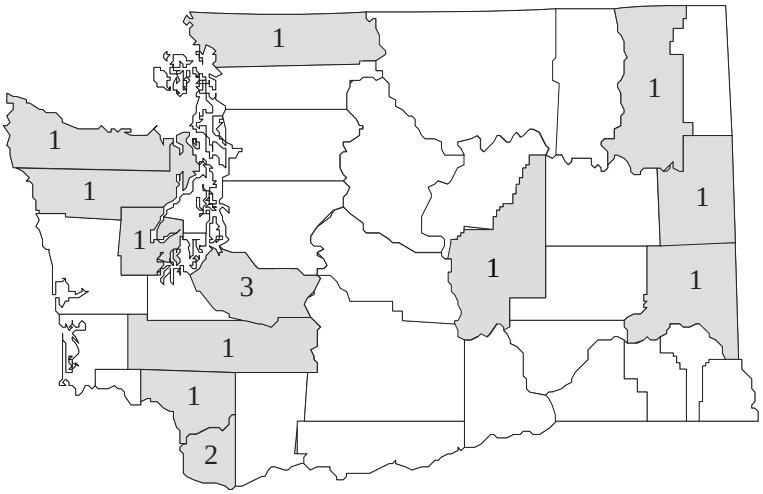
Public	0
Private	1
Total	1

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 2003, ten limited purpose landfills reported receiving 586,670 tons of waste.

Limited Purpose Landfills



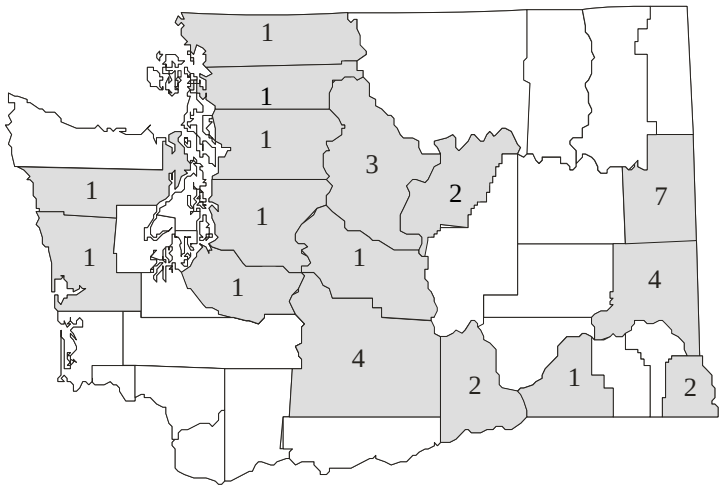
Public	1
Private	14
Total	15

Inert/Demolition 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 2003, 27 inert/demolition landfills reported receiving 476,214 tons of waste. In 2004, there were 33 inert/demolition landfills listed in the state. About 70% of the inert/demolition landfills were privately owned, with 30% being publicly owned.

Location of Inert/Demolition Waste Landfills



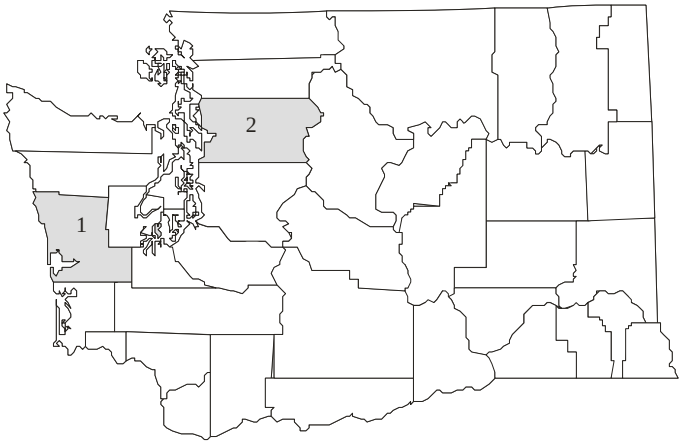
Public	10
Private	23
Total	33

Woodwaste Landfills

Woodwaste landfills that were previously permitted under the *MFS*, will now need to meet the requirements of *WAC 173-350-400, Limited Purpose Landfills.*

In 2003, one woodwaste landfill reported 34,188 tons of waste. The remaining permitted woodwaste landfills were either inactive or were actually removing waste. In 2004, three woodwaste landfills were listed in the state, all privately owned.

Location of Woodwaste Landfills



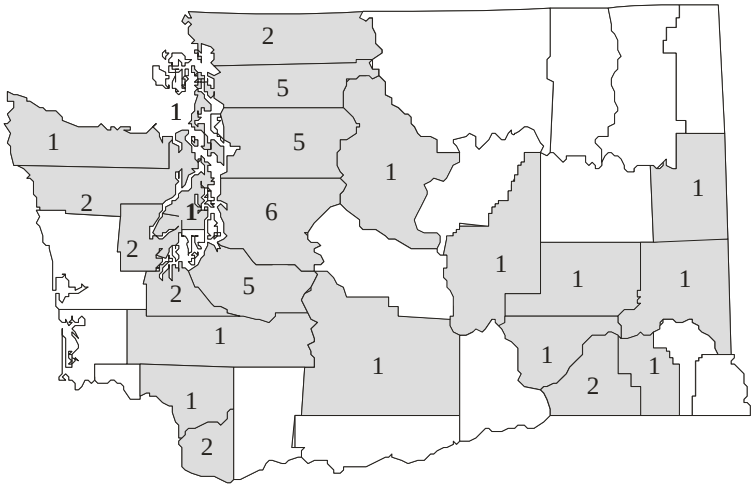
Public	0
Private	3
Total	3

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 2003, 34 composting facilities reported 511,434 tons of composted material produced. In 2004, there were 43 permitted composting facilities and three exempt facilities identified statewide.

Location of Compost Facilities



Permitted	43
Exempt	3
Total	46

Recycling Facilities

The recycling facility requirements under the *MFS* included land application and composting. These two facility activities fall under their own sections of th*e 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.

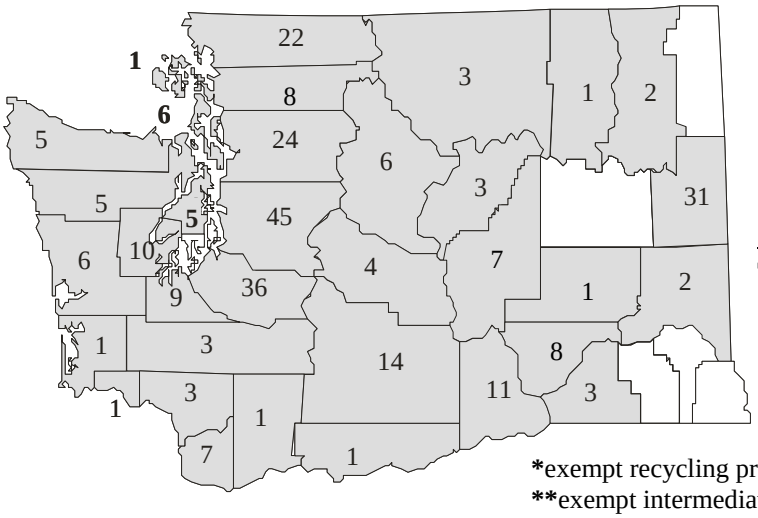
(f) Storage of moderate risk waste prior to recycling which is subject to WAC 173-350-360.

(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 2004, there were 133 exempt recycling processors, 126 exempt intermediate recycling facilities and 36 permitted intermediate recycling facilities identified.

Location of Recycling Facilities



*	133
**	126
***	36
Total	295

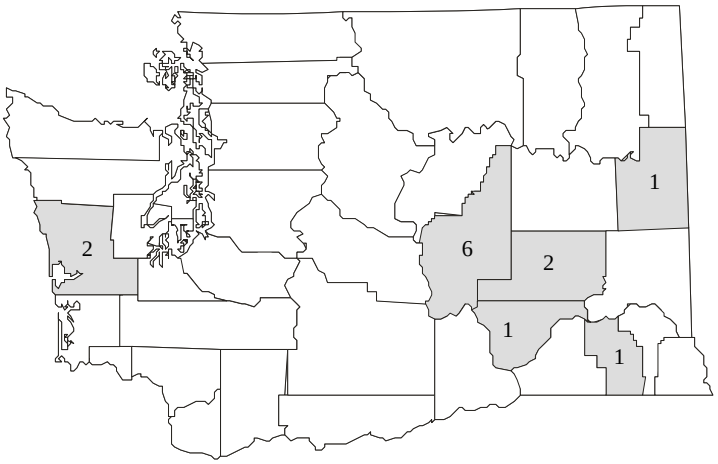
*exempt recycling processors
**exempt intermediate recycling facilities
***permitted intermediate recycling facilities

Land Application

Under the *MFS*, utilization of solid waste on the land (land application) was permitted as a recycling facility. *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 2004, 13 private land application sites were identified.

Location of Land Applications



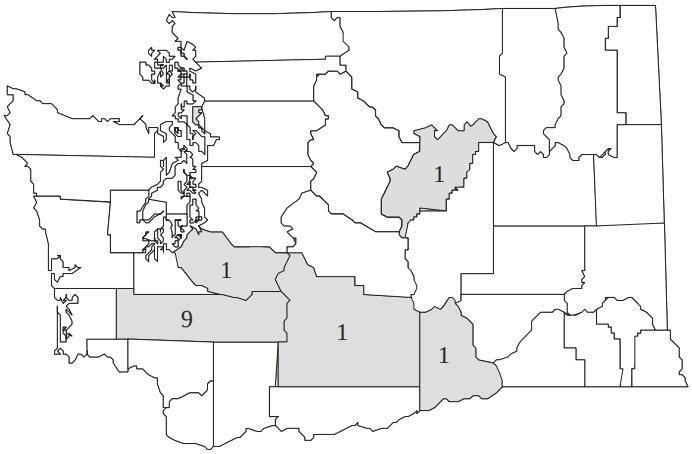
Public	0
Private	13
Total	13

The *MFS* also allowed the disposal of certain waste on the land. The "disposal of waste" via land spreading is no longer allowed under the *Solid Waste Handling Standards*. In order for materials to be land applied the facility must meet the requirements of *WAC 173-350-230 Land Application* and be permitted as a land application site. In some cases,

wastes that are to be used as a soil amendment may be able to receive a Beneficial Use Permit Exemption from Ecology, as outlined in *WAC 173-350-200 Beneficial Use Permit Exemptions*.

In 2004, there were 13 landspreading sites identified statewide.

Location of Landspreading Disposal Sites



Public	0
Private	13
Total	13

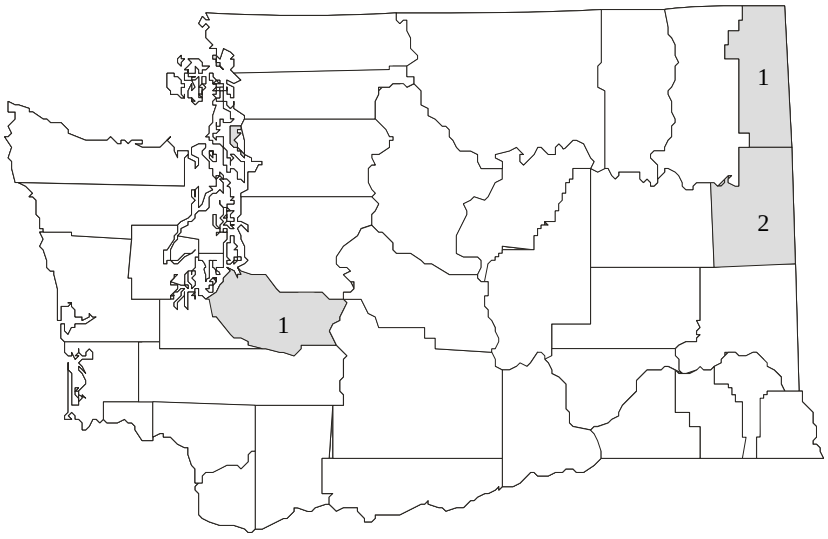
Energy Recovery and Incineration Facilities

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 2003, four energy recovery or incineration facilities were identified statewide. They reported 303,978 tons of waste incinerated in 2003. 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.

Energy Recovery/Incinerator Facilities



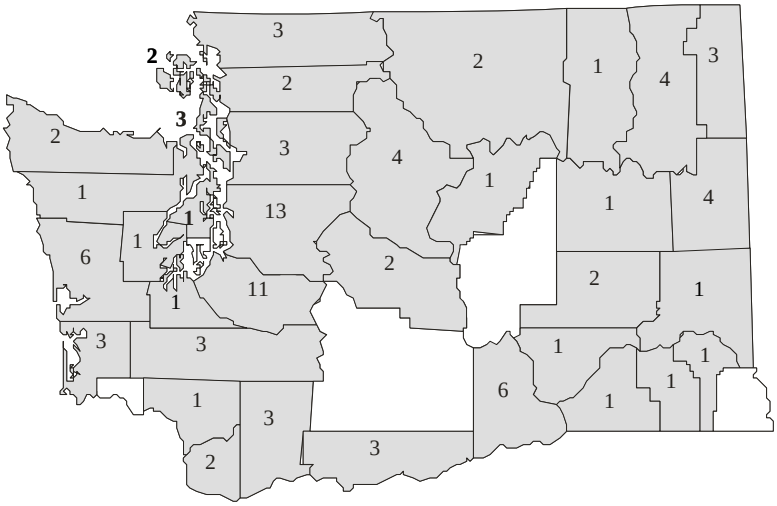
Public	2
Private	2
Total	4

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 2004, there were 98 transfer stations identified statewide, 62% being publicly owned.

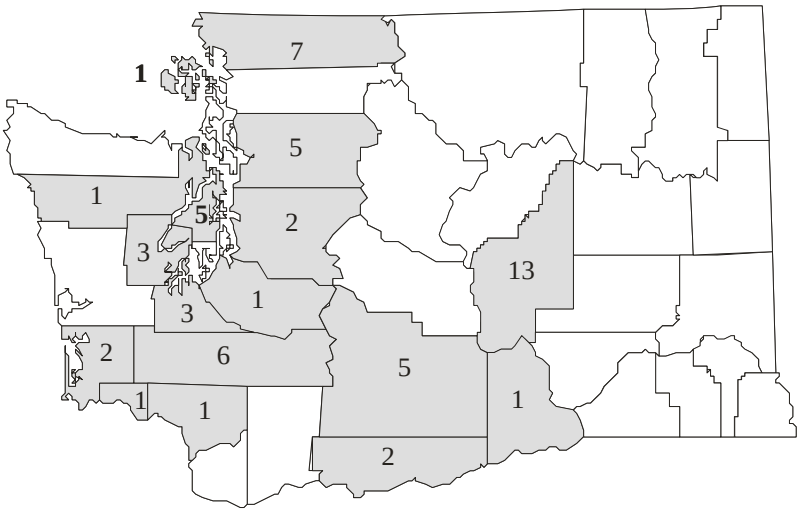
Location of Transfer Stations



Public	61
Private	37
Total	98

In 2004, there were 60 drop boxes identified statewide, 87% being publicly owned.

Location of Drop Boxes



Public	52
Private	8
Total	60

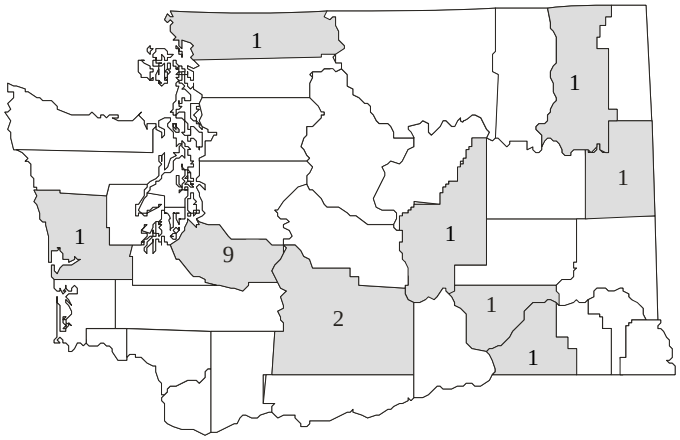
In 2004, there were no separately permitted baling stations identified statewide. There were three publicly owned compacting facilities identified.

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 2004, 20 regulated piles (not including composting or tires) were identified statewide. The majority, 61%, were privately owned.

Location of Piles



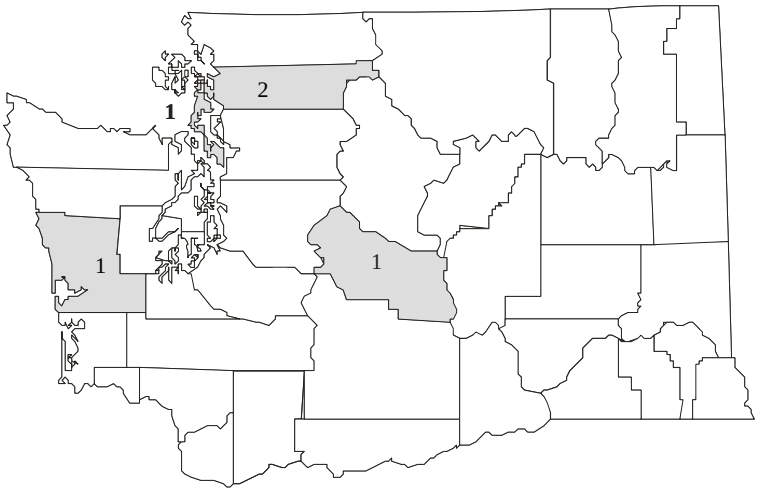
Public	7
Private	11
Total	18

Surface Impoundments and Tanks

Surface impoundments were regulated under the *MFS*. There were no specific requirements for tanks. Surface impoundments and tanks are now regulated under *WAC 173-350-330 Surface Impoundments and Tanks*, except for leachate holding ponds at compost facilities which are regulated under *WAC 173-350-220 Composting Facilities*, underground storage tanks subject of *chapter 173-360 WAC, Underground Storage Tanks*, tanks used to store moderate risk waste which are subject to *WAC 173-350-360 Moderate Risk Waste Handling*, and others specified in *WAC 173-350-330(1)(b).*

In 2004, five surface impoundments were identified statewide, with 60% being privately owned.

Location of Surface Impoundments



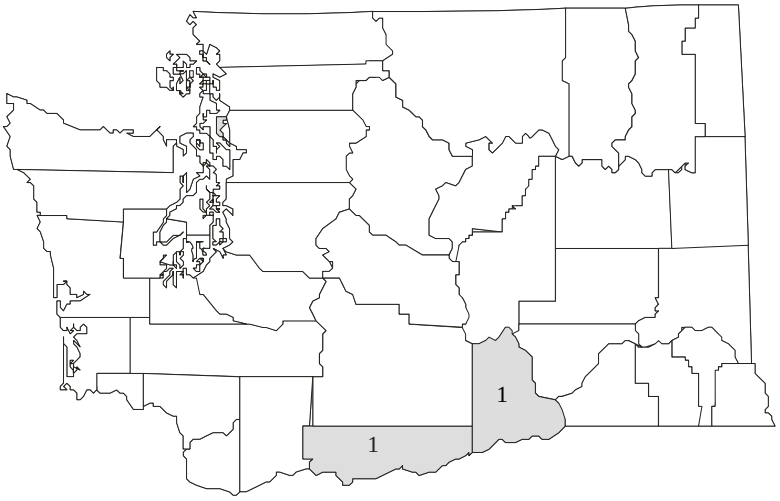
Public	2
Private	3
Total	5

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 2003, there were two privately owned permitted tire piles identified.

Location of Permitted Tire Piles



Public	0
Private	2
Total	2

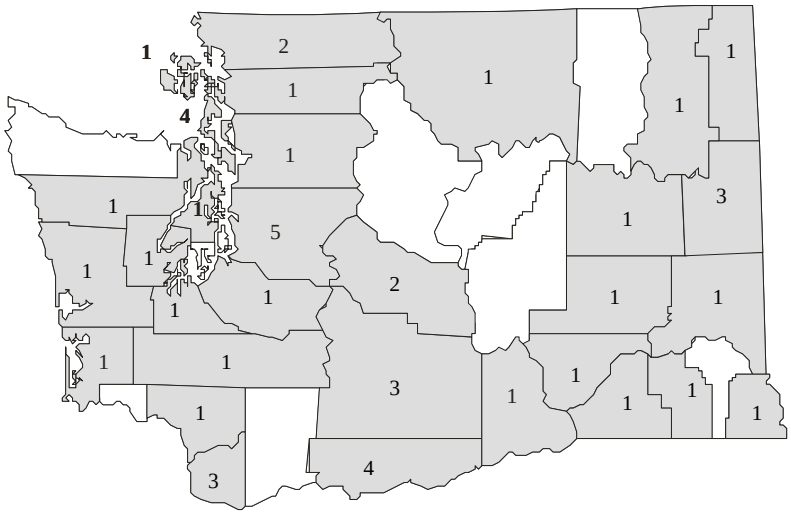
Moderate Risk Waste Handling

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 2004, 49 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 2003.

Location of MRW Sites



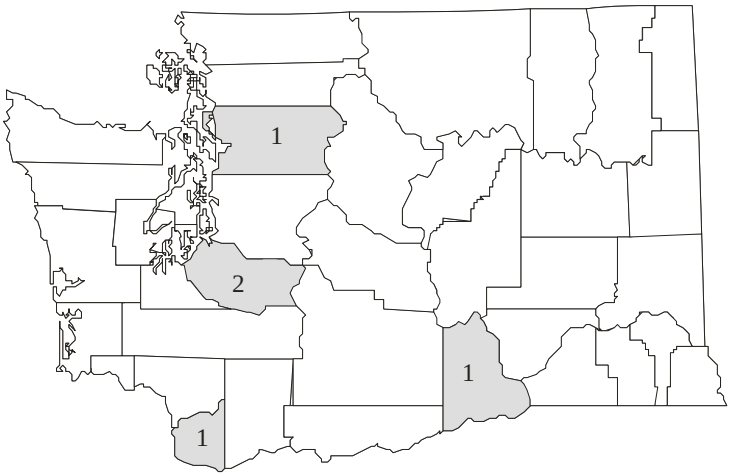
Public	43
Private	6
Total	49

Other Methods of Solid Waste Handling

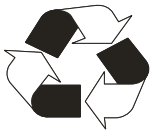
WAC 173-350-490 Other Methods of Solid Waste Handling is included to deal with other methods of solid waste handling not specifically identified elsewhere in the MFS or excluded from the regulations.

In 2003 there were five facilities identified under the *MFS* as "Other." They were all vactor waste decant stations. These facilities will either be subject to permitting under *WAC 173-350-320 Piles Use for Storage or Treatment* or *WAC 173-350-490 Other Methods of Solid Waste Handling* depending on the specific facility.

Location of Other Facilities



Public	4
Private	1
Total	5



Chapter III
Partnering for the Environment

Ecology's Solid Waste and Financial Assistance Program (SW&FAP) has been reaching out to offer financial assistance, technical expertise, task force leadership, educational and planning assistance, and moral support to old and new friends in business, industry, agriculture, and local government.

Already this outreach has produced significant environmental results and tremendous promise for fundamental and progressive shifts in our relationships with the natural environment.

SW&FAP has provided technical and financial assistance to help local governments support these management programs and to permit and regulate solid waste management facilities. Over the last several years, government funding has become tighter while waste generation has increased and many solid and moderate risk waste issues have become more complex. As recognized by many government, community, and business leaders, pioneering new ways to solve these problems and implementing more sustainable resource-management practices are essential to the state's environmental, economic, and social well-being. These solutions require the participation and cooperation of many people who bring with them a variety of expertise, perspectives, creative ideas, and resources.

This change in the way we do business with local government and businesses has begun with a clear assessment of what can and should be done to help us all move toward a sustainable world. The first step has been a recognition that we are all partners in the work ahead. To that end, a team of specialists assigned to work on building the relationships to foster sustainability has set to the work described in the following pages.

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.

Ecology provides technical assistance to local governments in preparing and implementing their plans. Ecology also approves the plans. Table 3.1 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 3.1
Current Status of Solid and Moderate Risk Waste Plans in Washington
(as of September 2004)

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	Currently updating Comprehensive Solid Waste Management Plan (CSWMP). MRW Plan is joint among Adams, Lincoln and Grant Counties.
Asotin	Yes - 1998	26% by 1997	1993	N	
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
Clallam	Yes – 2000	20% by 1996 40% long range goal	1991	N	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.
Clark	Yes - 1994	50% WRR by 1995	2002	Y	Currently updating CSWMP
Columbia	Yes - 2003	20% WR/R	1991	N	Plan approved
Cowlitz	Yes - 1993	50% WRR by 1995	1993	N	Are about halfway through update
Douglas	Yes - 2002	25% by 2008	2002	Y	Plan approved
Ferry	Yes - 1993	35% WR/R by 1995 50% WR/R by 2013	1994	N	Updating CSWMP
Franklin	Yes - 1994	35% R by 1995 5% WR by 1998	1993	N	Currently updating CSWMP
Garfield	Yes - 1993	26% WR/R by 1997	1992	N	Currently updating CSWMP, first draft complete
Grant	Yes - 1995	22% WR/R by 2000	1992	N	Amended CSWM Plan 1999. MRW Plan is joint among Adams, Lincoln and Grant Counties.
Grays Harbor	Yes - 2001	50% WRR by 1995	1991	N	Implementation
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	Implementation

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
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.
Seattle	Yes - 1999	Recycle or compost: 60% 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.
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 - 1993	18% WRR by 1995	2000	Y	Currently updating CSWMP
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	Implementation
Okanogan	Yes - 1993	30% by 2000	1991	Y, in current draft	Currently updating CSWMP, finishing up interlocal agreements
Pacific	Yes – 2000	32% WRR by 1996	1990 – 2000 Operations Plan	N	Implementation
Pend Oreille	Yes - 2002	45% WR/R by 2015	1993	N	Plan approved
Pierce	Yes - 2000	50% WRR by 1995	1990	N	Implementing
San Juan	Yes - 1996	50% by 1995	1991	N	Currently updating CSWMP
Skagit	Yes - 1994	50% or better by 1995	1992	N	Draft CSWMP approved by Ecology May 31, 2004. Awaiting final submittal to Ecology.
Skamania	Yes - 1992	40% WRR by 1998 50% long range goal	2001	Y	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
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 intends to rejoin the Snohomish County CSWMP. The county is the lead on the MRW plan.
Spokane	Yes - 1998	50% Recycling by 2008	1993	N	
Stevens	Yes - 1994	36% WR/R by 2012	1993	N	Starting to update CSWMP
Thurston	Yes - 2001	Increase recycling rate by 2.5% by 2005	1993	N	Implementation.
Wahkiakum	Yes - 2003	20% WRR by 1996	2001	N	
Walla Walla	Yes - 1994	40% by 2002	1991	N	Currently updating 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	Currently updating 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 (CPG) are awarded to local governments to prevent pollution from improper management and disposal of solid waste and moderate risk waste. Funding for CPG comes from the Local Toxics Control Account (LTCA), a tax on first possession of hazardous substances in the state.

The coordinated grant structure encourages local governments to work together to examine their waste management needs and decide the activities they will propose for grant funding. Ecology allocates the available funds for countywide areas, using a base amount for each county plus a per capita amount. Local governments must apply and meet eligibility requirements to receive CPG grants and they must provide a cash match of 25% of the total eligible costs of their projects. For many jurisdictions, CPG makes up a significant portion of the annual budget for solid waste activities.

A new coordinated prevention grant cycle began on January 1, 2004 and will run through December 31, 2005. For this grant cycle, $17,345,378 was awarded in 121 grants to Washington cities, counties, and public health jurisdictions. The grants will leverage $23,054,170 in solid and moderate risk waste projects. The grant funds were distributed as follows:

Waste Reduction/Recycling	$ 6,806,414
Solid Waste Enforcement	$ 2,829,851
Moderate Risk Waste	$ 7,709,113
	$17,345,378

Program Redesign

The 2004-2005 CPG cycle marked the beginning of a statewide effort to implement changes to the grant program. These changes reflect a growing desire for collaboration between jurisdictions, increased state-local or inter-local partnerships, increased sharing of local program information, and shared decision-making about grants policy issues. The changes are also consistent with an audit of environmental grant and loan programs done by the Joint Legislative Audit and Review Committee (JLARC) in January 2001. The Legislature passed HB 1785, directing Ecology to implement several recommendations made by JLARC in the audit report.

Ecology staff began working with the CPG Workgroup in August 2002 to incorporate changes into the grant program. Changes for the 2004-2005 grant cycle include a focus on reporting outcomes of CPG projects and on describing the environmental benefit provided by the grant program. Ecology is also working in partnership with local governments to redesign our data management and grant reporting systems. A web-

based "Information Clearinghouse" system is currently under development. The system will help to store, organize and share information about local government solid waste activities, including those funded by CPG.

The CPG Workgroup is a partnership between Ecology grant staff and local government grant recipients. Grant recipients who are interested in participating in or providing feedback to the CPG Workgroup should contact Jeff Kelley-Clarke, Snohomish County Public Works (jeff.kelley-clark@co.snohomish.wa.us) or Jim Matsuyama, Tricounty Health District (jmatsu@netri.org). Additional information about the CPG Workgroup and the JLARC report are available on Ecology's CPG revision website (http://aww.ecydev/programs/swfa/cpg/). For more information about the "Information Clearinghouse" project, please contact Shelly McClure at smcc461@ecy.wa.gov or 360-407-6398.

CPG Goal and Priorities

The CPG Workgroup reconvened in late 2003 to begin planning the State Solid Waste Summit (Summit), which took place in June 2004. The Summit, which will be held every-other-year, provides an opportunity for CPG stakeholders from around the state to build partnerships, discuss current "hot" issues in solid waste management, discuss statewide priorities for CPG, and give feedback to the CPG Workgroup on proposed changes to the grant program.

The 2004 Summit was attended by over 100 participants, including grant recipients, Ecology staff and other interested parties. During the Summit, participants provided feedback on a set of CPG Statewide Goals. These goals will allow Ecology and grant recipients to monitor the progress of the grant program and better communicate our success in protecting human health and the environment. The goals are not intended to be applied to cities or counties – no jurisdiction will be expected to achieve or measure progress toward any of the goals individually. The CPG Workgroup is working to refine the goals based on comments received at the Summit. Grant recipients will have the opportunity to provide additional comments when the goals are published in the draft CPG Guidelines in early 2005.

Summit participants also had the opportunity to vote on the top 5 priority issues for Solid Waste. Stakeholders will work on together on these issues. Cullen Stephenson (Manager, Department of Ecology Solid Waste & Financial Assistance Program), Jeff Kelley-Clarke (Solid Waste Director, Snohomish County Public Works) and Jim Matsuyama (Director, Environmental Health, Northeast Tri-County Health District) agreed to coordinate statewide discussion of these issues. For more information on the 2004 Summit, including draft CPG Statewide Goals and a list of the priority issues please visit Ecology's website for the Summit Summary Report (http://www.ecy.wa.gov/programs/swfa/summit.html).

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 Public/Private Cooperation

Many partnerships between government, business, and the community have already been developed to better address these challenges on the local, state, or national level. The Solid Waste and Financial Assistance Program (SW&FAP) remains committed to supporting these existing partnerships. In addition, staff are identifying and helping to create new public/private partnerships to address current solid waste management challenges and to implement sustainability. By pooling resources and talents, these partnerships are identifying creative solutions to current solid waste management problems, converting waste to product, taking advantage of opportunities that might otherwise be lost, and sharing information to help others succeed. Examples of some of the partnerships supported by SW&FAP staff are discussed below.

Sustainable Building – "Green Building"

In 2004, the Solid Waste and Financial Assistance Program (SW&FAP) continued to develop as a leader of the rapidly emerging constituency for sustainable design and construction, a movement commonly referred to as "green building."

At the state level, SW&FAP staff continued work with General Administration (GA), the Office of Superintendent of Public Construction, several local governments, industry association representatives, and private sector partners to develop incentives for green building. Among the incentives rolled out in 2004 is the Washington Sustainable Schools program for K-12 schools. Staff participated in the development, review and approval of this self-reporting green building certification program and encouraged establishment of a $1.5 million grant program to subsidize implementation of the standard by school districts all across the state. Staff helped Spokane School District 81 to qualify for a portion of these funds on two school construction projects due to begin construction in Spring 2005.

Staff worked with regional partners to help the Cascadia Chapter of the U.S. Green Building Council recruit a paid executive director and field coordinators in the Puget Sound. This organization, which encompasses all the Pacific Northwest states, is the leading regional chapter of the Council. This organization sponsors the Leadership for Energy and Environmental Design (LEED), a tremendously popular green building standard that brings recognition to buildings designed and constructed in sustainable ways.

Across the state, Ecology's regional staff efforts led to a relative explosion of interest and action for green building design and construction. In Eastern Washington, six years of commitment by Ecology staff to develop and present formal academic and informal seminar training in sustainable building began to bear fruit on the ground.

Ecology Regional staff led a public/private partnership of the Resource Efficient Building and Remodeling Council (REBAR), the Inland Northwest Trades Apprenticeship Training Council, the Spokane Alliance, Community Colleges of Spokane (CCS), and Spokane School District 81 to develop the largest Job Skills Program ($430,000), called "360° Training," to deliver 7,200 hours of specialized green building training to those involved in green building from "concept to concrete." As a result of this unique partnership, Spokane School District 81 committed to using the Washington Sustainable Schools standard for more than $150 million in planned construction over the next five years. The School District also committed to use apprentices trained in green building techniques by the REBAR Council, CCS and the numerous apprentice training programs.

The Spokane effort drew the attention of Columbia Basin College and the Richland School District. In Fall 2004, staff at Ecology's Central Region Office in Yakima began leading efforts to build a similar partnership in the Tri-Cities with an aim to turn $120 million in planned construction in the basin toward the Washington Sustainable Schools or LEED standards.

With the help of Ecology's Spokane staff, Community Colleges of Spokane is preparing designs for LEED Certified and Silver buildings that were scheduled to begin construction in 2005.

Apprentices being trained through the 360° Training program also expect to be working on more than $200 million in LEED Sliver construction planned at the state penitentiary in Walla Walla, pursuant to a Governor's Executive Order to commit to sustainable design that Ecology staff at Southwest Regional Office were instrumental in advancing in 2003.

Staff in Ecology's Spokane office also encouraged the Spokane Public Facilities District to register an $80 million Convention Center expansion project for LEED certification.

SWFAP staff, as volunteer executive director of the REBAR Council led an effort to expand membership on the Council for local architects and developers and the result has been the development of an aggressive green building agenda for Eastern Washington that includes:

- ☑ An inventory of reusable (vacant or underutilized) existing buildings in downtown Spokane;
- ☑ Development and implementation of the 360° Green Building Training Program, currently underway;
- ☑ Participation in a statewide effort to identify and then adopt a residential green building standard that will be promoted to home builders in Spokane County;
- ☑ An assessment and recommendation for action to remove barriers and establish incentive for green building in Spokane County;
- ☑ Investigation and preliminary planning for the development of a Green Building Design Center in Spokane.

The Sustainable Design and Construction Seminars course, designed by Eastern Region SWFAP staff, entered its fourth year at Washington State University-Spokane, where enrollment has quadrupled since its inception in 2001. At 32 students, the 2004 class is the largest ever. To date, more than 75 upper division students in architecture, landscape architecture, construction management, and interior design have learned the basics of sustainable design and construction from top professionals in the industry.

In Fall 2004, Ecology staff began offering technical advice to Spokane Neighborhood Action Programs (SNAP), which has begun design planning on phase two of it's groundbreaking green building low income housing development Riverwalk Point (more than 50 apartments).

Achitect Eric Armstrong, Jim Wavada (Ecology), SNAP Construction Manager Holly Millar and the Contractor's Project Manager, Randy Backman, reviewing plans for the location of lateral ground source heating system coils at the Riverwalk Point susutainable low income housing project in Spokane.

In 2004, Southwest Region SWFAP staff completed a major overhaul of the Sustainable Building Toolbox web site that helps Ecology retain its position as a leader in green building information for the state. The website now provides the public with up-to-date contacts, news, and links to other Green Building information sources. http://www.ecy.wa.gov/programs/swfa/cdl/index.html.

Southwest Region staff also assembled an extensive list of local suppliers of green building materials. Olympia Master Builders will print and distribute this list to South Sound contractors at their annual Home Show. Builders often don't know where they can purchase green materials. This document will remove that hurdle and encourage more green building while stimulating the local economy.

Southwest Region staff also provided technical expertise to the local Habitat for Humanity Sustainable House. This was a project designed by students of Evergreen State College and will be one of the greenest houses in the Puget Sound. Staff wrote and designed educational brochures and posters and staffed the house during the Tour of Homes in Summer 2004. Hundreds of people came to visit the house and learn about green building.

Southwest Region staff served as technical advisor to the Olympia Master Builders Built Green Committee, which has applied for a Public Participation Grant from Ecology. The Built Green Committee hopes to obtain funding for a series of educational seminars that will address the building/design community, the real estate/lending community, and the general public in the most suitable fashion for each group.

Finally, SWFAP staff assigned to work in the area of green building have been key and very active participants in the development of the Green Building Initiative within the Program's innovative Beyond Waste plan, which represents a bold new approach to waste management planning in Washington state. Staff involved in the Green Building Initiative of the Beyond Waste plan have developed an ambitious, but achievable work plan for making green building standard industry practice in Washington state.

Other agencies, governments, industries and industry associations, and educational institutions now expect that Ecology is the place to look for leadership and expertise in the blossoming green building movement.

Partnering for the Environment by Beneficial Use of Materials

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. Appendix B, Table B6 lists the facilities reporting composting activities in calendar year 2003. Thirty-four compost facilities reported actively recycling organic material in Washington in 2003. 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 600,000 cubic yards of finished compost were produced and sold.

Composting facilities are now regulated under chapter 173-350 WAC, *Solid Waste Handling Standards* (WAC 173-350-220, Composting Facility Standards). The new 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."

The new standards also offer several categories of composting activities that are exempt from solid waste permit requirements. The exemption categories were designed to "promote composting while protecting human health and the environment." 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.

Erosion Control and Stormwater Management

SW&FAP recognizes the potential for compost and organic mulches to reduce soil erosion and protect water quality. Use of compost in roadside improvements has steadily increased over the past several years. In September 2002, the Washington State Department of Transportation (WDOT) reported using 20 percent of all compost produced in the state from permitted compost facilities. SW&FAP anticipates future collaboration to document the benefits of compost used in erosion control blankets and filter berms.

Ecology continues to promote the concepts of the "Soil for Salmon" initiative, a program started by Washington Organics Recycling Council (WORC) in 1999. "Soils for Salmon" gained national recognition as an education program for raising public awareness about the link between soil quality in developed landscapes, water quality, and salmon recovery. In keeping with the soil quality/water quality link, Ecology incorporated voluntary best management practices (BMPs) into the Stormwater Management Manual for Western Washington. The BMPs call for preserving native soils as the best strategy for protecting site hydrology and preventing negative impacts to stormwater. Where soils must be disturbed during development, the BMPs call for increasing organic matter to a depth of 12 inches in order to improve infiltration and water holding capacities of the soil.

Some exciting results of stormwater infiltration occurred in October 2003 when the Seattle area received record-breaking rainfall. In just a little over 32 hours, rain gauges recorded over four inches of rain at a residential site where the landscape had been installed with compost amended soils according to the storm water BMPs. University of Washington researchers observed no run-off from the site.

Biosolids

The Washington State *Biosolids Management Rule*, chapter 173-308 WAC, and the Statewide General Permit for Biosolids Management went into effect in the spring of 1998. The original statewide permit was a five year permit that expired in May of 2003. Since that time the program has continued to operate under the guidance and auspices of the original permit. The new replacement general permit is undergoing final review. Barring any unforeseen circumstance or actions, reissuance of the Statewide General Permit for Biosolids Management is expected by the end of 2004. The permit will be

reissued for a five-year term and will thus expire in late 2009 or early 2010. This time schedule could change if a formal appeal of the permit or DNS is filed. In that case, time would be required for managing a public comment period and responding as necessary. During the first permit cycle for biosolids management, the staff focused on three workload areas:

- Delegation of portions of the state program to local health departments
- Implementing the permit program
- Technical Assistance

Total production of biosolids within the state in 2003 was approximately 90,000 dry tons. Of this amount, approximately 90% was land applied, the majority of the remainder was incinerated, and less than 3% was landfilled. The amount of biosolids on sites, being stored from year to year is difficult to account for by our current tracking system.

Delegation to Local Health Districts

A total of eleven health jurisdictions have accepted some degree of delegation under the initial general permit. Those health departments/districts entered into a formal Memorandum of Agreement with Ecology. After the initial permit and the MOAs expired, some of the health departments chose to continue the delegation agreement by means of a letter of continuation.

The delegated local agencies have actively taken the lead in conducting various aspects of the biosolids management program within their county jurisdiction. Other county health departments have decided against taking delegation of some of the program in the latter jurisdictions. Funding and workload demands on county staff continue to be the major reason cited by health departments when choosing not to pursue delegation of the biosolids program.

Since Ecology's initial outreach to counties in late 1998, no new delegation agreements have been finalized. As we move toward reissuance of the Biosolids General Permit, we continue to see local budgets tightening. We expect that shortfalls in county budgets and staff workload excesses will continue to be a barrier to our biosolids program delegation efforts.

Permit Program

The total number of Treatment Works Treating Domestic Sewage (TWTDS) within Washington State is estimated at 375. These include federal, state and private sewage treatment works, regional septage management facilities, beneficial use facilities (BUFs) some composting facilities and facilities individually designated by Ecology as treatment works treating domestic sewage. This is the universe of facilities that are required to obtain permit coverage under the Washington State Biosolids Management Program.

Publicly owned (municipal) sewage treatment works make up the majority of facilities covered.

To obtain coverage under the biosolids permit all treatment works initially must submit a "Notice of Intent" to Ecology indicating that they are operating within the biosolids management program. This Notice of Intent provides provisional approval to continue to operate and obligates the facility to comply with the applicable requirements of the statewide biosolids regulations. All currently operating TWTDS have or should have submitted a second Notice of Intent for continuing coverage under the new general permit. Within a time frame set forth in the permit, all currently operating facilities and new facilities must then submit a biosolids permit application in order to obtain final approval of coverage under the permit. This sequence is the same as was in place at the time the first general permit was issued.

As of October 2004, approximately 85 TWTDS have obtained final approval of coverage under the biosolids Statewide General Permit. In addition, final coverage for several facilities is on hold until after the "Effective Date" of the new Statewide General Permit. The "Effective Date" is targeted for late 2004 or early 2005. Some of the biosolids generated go to composting facilities and are permitted under a county solid waste permit. The solid waste permit must be at least as stringent as the biosolids management regulations. Permitting of beneficial use facilities (BUFs) and some regional septage treatment facilities requires a disproportionate amount of time compared to a single wastewater treatment plant. After the BUFs are permitted, the time necessary for permitting of small treatment works utilizing these facilities is lessened. Large BUFs may operate a number of land application sites in several counties which can complicate the SEPA and public notification processes.

Septage Management

A Septage Management Strategic Plan, funded by the 2002 Legislature, resulted in a series of recommendations to improve septage management within the state. There was general agreement that 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 public treatment works are needed that can and will accept septage for treatment.

All of the above options require an expanded program for septage management. Revisions to the *Biosolids Management Rule*, chapter 173-308 WAC, would be essential.

The monetary resources need to expand the septage program are not currently available. Current funding will not support the recommendations of the Septage Management Advisory Committee and is not adequate to permit all land application sites or carry out other program enhancements.

In a recent meeting of members of Ecology and jurisdictional health directors it was agreed that these agencies and the Department of Health should together develop a broad

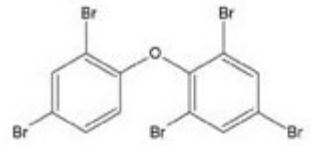
package for presentation to the legislature to address septage issues in the state. It was recommended that the package include the concept of on-site system operations and maintenance, as well as regulatory aspects. The legislative request would need to include a funding mechanism that would provide sufficient resources to sustain all aspects of the septage management program. The funding mechanism has been a major issue throughout the development of the septage management strategic plan as well as for support of the original biosolids program. Permit fees derived from septage facilities provide less than five percent of the program support and utilize a disproportionate amount of the program funds. Municipal WWTPs provide the majority of program funds and are increasing pressure to develop a funding mechanism that is more equitable.

Partnering for the Environment by Focusing on Specific Problem Waste Streams

Another Persistant Bioaccumulative Toxin: Brominated Flame Retardants

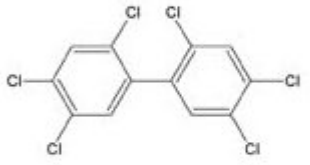
Brominated flame retardants are emerging on the horizon of environmental health concerns. Known as polybrominated diphenyl ethers (PBDEs), flame retardants are used in a variety of everyday products, such as foams, paints, wire coatings, plastic casings, and carpets.

According to the Bromine Science and Environmental Forum, an industry group based in Brussels, Belgium, 148 million pounds of these chemicals are produced each year (2001 data). Workers in electronics-recycling facilities face unusually high exposures to PBDEs from the plastic casings.

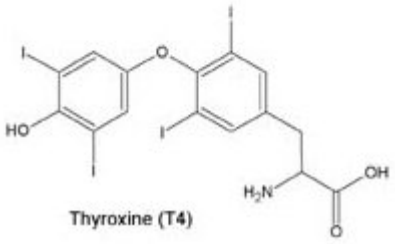


2,2',4,4',6-pentabromodiphenylether
(PBDE-100)

Swedish women's breast milk samples from 1972 to 1997 show a 60-fold increase in PBDEs. In Monterey California, women's breast milk showed a 100-fold increase from 1982 to 1992. Similarly to PCBs, PBDEs are sequestered in fatty tissues and breast milk and have been appearing in human and animal tissues around the world. New data suggest that certain types of PBDEs can poison reproductive, nervous, and hormonal systems, though relatively little is truly known about the human health effects of these compounds. While PBDEs are scarcer than PCBs, PBDEs accumulate up the food chain and could become the PCBs of tomorrow.



2,2',4,4',5,5'-hexachlorobiphenyl
(PCB-153)



Thyroxine (T4)

Two formulations are penta and octa, which signify the number of bromines attached to a certain configuration of molecule. As a result of their widespread presence and concerns about their effect on neurological development, California has banned sales of penta and octa PBDE by 2008.

A third formulation of PBDEs is the fully brominated configuration, called deca. It represents the major product in all markets, accounting for 80% of the total PBDE production worldwide (Science News, 2003). Some studies have shown that fully brominated PBDEs can shed bromines and convert to other forms of PBDEs. The European Union issued the *Waste Electronic and Electrical Equipment Directive and Reduction of Hazardous Substances* which bans sales of materials of penta and octa PBDE and calls for a thorough risk assessment of deca PBDE.

In January 2004, Governor Gary Locke directed Ecology, in coordination with the Department of Health, to draft a plan to manage PBDEs. The plan will study the sources, uses, and known effects of PBDEs in Washington and include recommendations for the use of PBDEs and the disposal of products containing PBDEs. Ecology has assembled an advisory committee of representatives from a wide spectrum of perspectives—from makers of PBDE products to businesses that dispose of them, from health groups to physicians and scientists—to provide information and perspectives on possible policy recommendations. Final recommendations from Ecology are due to the Governor by December 1, 2004. You can visit Ecology's PBDE flame retardants Web site at http://www.ecy.wa.gov/programs/eap/pbt/pbde/ for more information on the advisory committee and flame retardants.

From
Science News, "Burned by Flame Retardants?" **Charlotte Schubert** Week of Oct. 13, 2001; Vol. 160, No. 15 , p. 238
Science News, "Flaming Out?" **J. Raloff** Week of November 1, 2003 vol, 164

Mercury, Amalgam Waste, and the Food Chain

The Persistant Bioaccumulative Toxins (PBT) proposed strategy developed by Ecology (2000), prioritized the first pollutant as mercury, due to proven environmental and human health problems. It is well publicized that when released into the environment, mercury can recycle through the air indefinitely or can bind with bacteria in water to create methylmercury. When a fish eats organisms containing these bacteria, methylmercury is ingested and bioaccumulates in fish tissue, and subsequently, consumers of that fish tissue. The effects of mercury exposure are most severe for developing fetuses and young children. Mercury is damaging babies' central-nervous and cardiovascular systems. In adults, larger amounts of methylmercury can also damage the central-nervous and cardiovascular systems. Based on human and animal data, the International Agency for Research on Cancer (IARC) and the U.S. EPA have classified methylmercury as a "possible" human carcinogen. For more information visit http://www.epa.gov/mercury/index.html.

You can find mercury in many everyday products because of its strength and ability to handle large temperature ranges. In dentistry, mercury is used in fillings because of the temperature variance of the foods and liquids we eat or drink. Other products subjected to temperature fluctuations, including thermometers, switches, thermostats and fluorescent light bulbs or tubes contain mercury for the same reason. Mercury also is used to produce some pharmaceuticals and cosmetics for its therapeutic or chemical properties.

While mercury-containing products are a source of exposure, national studies have shown the largest source of mercury released into the environment is from coal burning plants, approximately 49 tons a year directly emitted into the atmosphere, or 98 tons overall released to the environment (Environmental Working Group, 1999).

However, mercury pollution from other sources is preventable and significant. In a King County Report published November 2002, mercury from dental uses is most likely the greatest single "non-point" contributor to mercury to the sewer system. This comes from an evaluation of seven municipal waste water plants, which found that dental offices accounted for approximately 40% of the mercury load, more than three times the next largest source (Association of Metropolitan Sewerage Agencies 2002). There are 2600 dental clinics in Washington -- all produce wastewater that can potentially carry mercury loads to the environment. Improper disposal of mercury to the sewer or septic system can cause methylization and uptake by fish. King County estimated that 106 lbs of mercury from dental offices was disposed of in the biomedical waste stream (also known as red bag waste), which is not designed to handle mercury and may eventually leach or enter the atmosphere. (http://www.govlink.org/hazwaste/publications/sqg_mercury_1.pdf http://dnr.metrokc.gov/wlr/indwaste/dentfact.pdf)

The Washington State Department of Ecology (Ecology) and the Washington State Dental Association (WSDA) are collaborating to help dental offices properly control dental office waste water by implementing updated Best Management Practices by 2005, consistent with the Washington State Mercury Chemical Action Plan (available at: http://www.ecy.wa.gov/biblio/0303001.html. Ecology and the WSDA agree that the most effective approach is a cooperative voluntary compliance program between dentists and state and local governments. If successful, the need for more costly regulation of dental offices can be avoided. The Memorandum of Understanding between Ecology and the WSDA can be found at: http://www.ecy.wa.gov/programs/eap/pbt/documents/mou-ecy-wsda.pdf .

Dental Best Management Practice, Frequently Asked Questions, a poster for dental offices, a list of service providers, and other information is located at www.ecy.wa.gov/dentalbmps .

Partnering for the Environment through Education and Information Sharing

Information Clearinghouse

Over the years many strategies have been deployed to address solid waste issues around Washington, yet this institutional knowledge is not in one, easily accessible location. Ecology heard from several local governments and the Joint Legislative and Audit Review committee that the State needs 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 project goals are:

- To have one reporting and interactive database for agency staff and local governments to enter information about solid-waste-related programs and resources, both those that are funded by Coordinated Prevention Grants and those that are not.
- To provide a searchable electronic library of solid-waste-related programs and services for agency staff and stakeholders.
- To facilitate learning, document success of programs, reduce duplication, conserve resources, and be more effective helping to inform future strategies.
- Gain feedback from local government user groups to ensure the database and library contain valuable information that is useful to local governments.

Ecology's management and staff would like to address this need through the development of an on-line system currently referred to as the Information Clearinghouse. Ecology's Information Technology staff will develop the system in-house with direction from a planning committee made up of local government and Ecology representatives. The system will be on-line by December 2005. The main audience and target user of this system is local government solid waste staff, hazardous waste and health department staff, Ecology management and staff, and policy decision makers. The general public will be able to access information as well. If you have questions about the project, contact Shelly McClure at smcc461@ecy.wa.gov or 360-407-6398.

Washington State Recycling Association (WSRA)

The WSRA is a trade association whose mission is to provide leadership and education to foster the expansion, diversity, and economic vitality of recycling as part of sustainable resource management. Benefits and services of this organization include networking opportunities, a newsletter, annual conference and trade show, and workshops. SW&FAP is a GOLD sponsoring member and supports WSRA through representation on its board of directors and chairing of the Education Committee.

Compost Facility Operator Training

SW&FAP views operator training as an essential component of a successful composting industry. SW&FAP 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.

One area of focus for the training in October 2003 was the new requirements found in chapter 173-350 WAC, *Solid Waste Handling Standards*. The new requirements address how to successfully operate a composting operation, both large and small, without causing environmental problems.

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 and demolition landfills,
- Limited and special 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.

Over 1,000 persons have taken one or both courses since the programs inception. To date 569 people have been certified for landfill operations and 375 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 Schools Awards

On May 21, 2004, at the St. Martin's College Worthington Center in Lacey, Ecology Solid Waste and Financial Assistance Program Manager Cullen Stephenson presented over $21,000 in cash awards to 21 schools from across the state. Over 50 schoolchildren attended this ceremony, which celebrated their schools' exceptional environmental sustainability efforts during the 2003-2004 school year.

Cullen Stephenson, Master of Ceremonies

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 long-standing programs. Additionally, schools that submit outstanding plans for future programs will receive seed money to assist with start-up costs.

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

- The **Seed Award** assists schools with the cost of starting up programs. This year, nine such awards, ranging from $1,000 to $3,000, were presented.
- The **Sustainable School Award** acknowledges schools with ongoing waste-reduction or recycling programs. Twelve schools received $500 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.

The majority of award winning schools were present for the celebration. Members of the audience included Bill Panos, Sustainable Schools Program Manager with the Office of the Superintendent of Public Instruction, Representative Sam Hunt, Senator Karen Fraser, and Mrs. Terry Husseman. Ecology's Director, Linda Hoffman, gave the opening remarks and shook hands with all the award winners. As usual, Cullen Stephenson, Ecology's Solid Waste and Financial Assistance Program Manager, handled his duties as Master of Ceremonies.

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. Figure 3.1 shows the percent of school awards by county. Table 3.2 identifies the 2003-2004 school year winners of the "Terry Husseman Sustainable School Awards."

Figure 3.1 Percent of School Awards by County

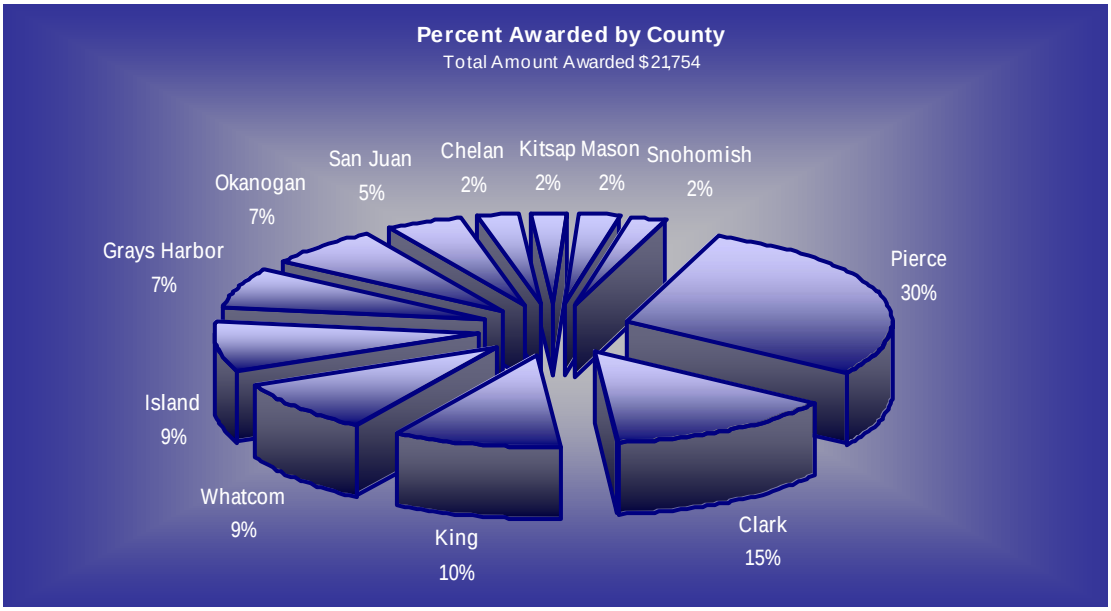


Table 3.2
Winners of the "Terry Husseman Sustainable Schools Awards"
for the 2003-2004 School Year

School	Amount
Seed Award	
Burton Elementary, Evergreen School District in Clark County	$3,000
Chloe Clark Elementary in Pierce County	$3,000
Issaquah Valley Elementary in King County	$1,225
Liberty Bell Junior and Senior High & Methow Valley Elementary in Okanogan County	$1,500
Lister Elementary in Tacoma	$1,889
Manitou Park Elementary in Tacoma	$1,240
Orcas Elementary in San Juan County	$1,000
South Whidbey Intermediate School on Whidbey Island	$1,400
Taholah School in Grays Harbor County	$1,500
Sustainable School Award	
Cashmere Middle School in Chelan County	$500
Eisenhower Middle School in Snohomish County	$500
Acme Elementary in Whatcom County	$500
Harmony Elementary in Whatcom County	$500
Kendall Elementary in Whatcom County	$500
Mt. Baker Junior & Senior Highs in Whatcom County	$500
Langley Middle School on Whidbey Island	$500
Komachin Middle School in Thurston County	$500
Montlake Elementary in Seattle	$500
North Mason High in Mason County	$500
Orchard Heights Elementary in Kitsap County	$500
Tolt Middle School in King County's Riverview School District	$500

For more detailed information about the School Awards Program or guidance on how to establish a program in your school, please visit our Web site at 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 2003, over 10,000 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. The information line has information on alternatives to hazardous household products, and can direct callers to 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.

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. The database has recently been expanded to include events such as compost bin sales and thermometer exchanges. 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 now 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. "Fun with Recycling" has neat 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/.

Ecology Walks Its Talk

Ecology Sustainability Plan

In September 2002, Governor Gary Locke issued Executive Order #02-03: Sustainable Practices by State Agencies. It directed state agencies to write plans describing strategies to modify practices regarding resource consumption; vehicle use; purchase of goods and services; and facility construction, operation, and maintenance.

The Executive Order set the following long-term goals to guide the development of the plans:

- **Institutionalize sustainability as an agency value.**
- **Raise employee awareness of sustainable practices in the workplace.**
- **Minimize energy and water use.**
- **Shift to clean energy for both facilities and vehicles.**
- **Shift to nontoxic, recycled and remanufactured materials in purchasing and construction.**
- **Expand markets for environmentally preferable products and services.**
- **Reduce or eliminate waste as an inefficient or improper use of resources.**

Agencies were to consider the impact of their operations on human health and the environment and were to consider:

- **Health and safety programs.**
- **Construction, maintenance, and operation of buildings and facilities, including building materials, recycling, cleaning products, and water and energy use.**
- **Grounds maintenance, including chemical use and watering.**
- **Fleets and transportation, including opportunities for the use of efficient, low-polluting vehicles such as hybrid or biodiesel.**
- **Procurement, including the use of environmentally friendly products.**

Ecology has been a leader in state government in these areas. The low hanging fruit had been picked. So, our plan reached high up the tree.[4] The department set five goals for sustainability during the 03-05 biennium:

Goal I: Provide healthy and safe work environments complementary to host ecosystems.

[4] Ecology's Sustainability Plan can be viewed found at: http://www.ecy.wa.gov/biblio/0307020.html.

Goal II: Carry out agency operations and support services sustainability.

Goal III: Support Sustainable Communities.

Goal IV: Integrate sustainability principles into the agency's rules, policies, and practices.

Goal V: Institutionalize sustainability as an agency value and raise employee awareness of sustainable practices in the workplace

Department of Ecology's Sustainability Plan Implementation Highlights

Sustainable Energy

The department has been successful in accomplishing many of the strategies to meet this goal. Among them, agency management agreed to purchase "green energy." As part of the agency budget, four percent of the agency's electricity will be green energy. Following the recommendations in the "Pathways to Sustainability" study, an additional four percent will be added each year over the next twenty-five years, at which time the agency will be meeting all its electricity needs from sustainable sources.

LEED- EB

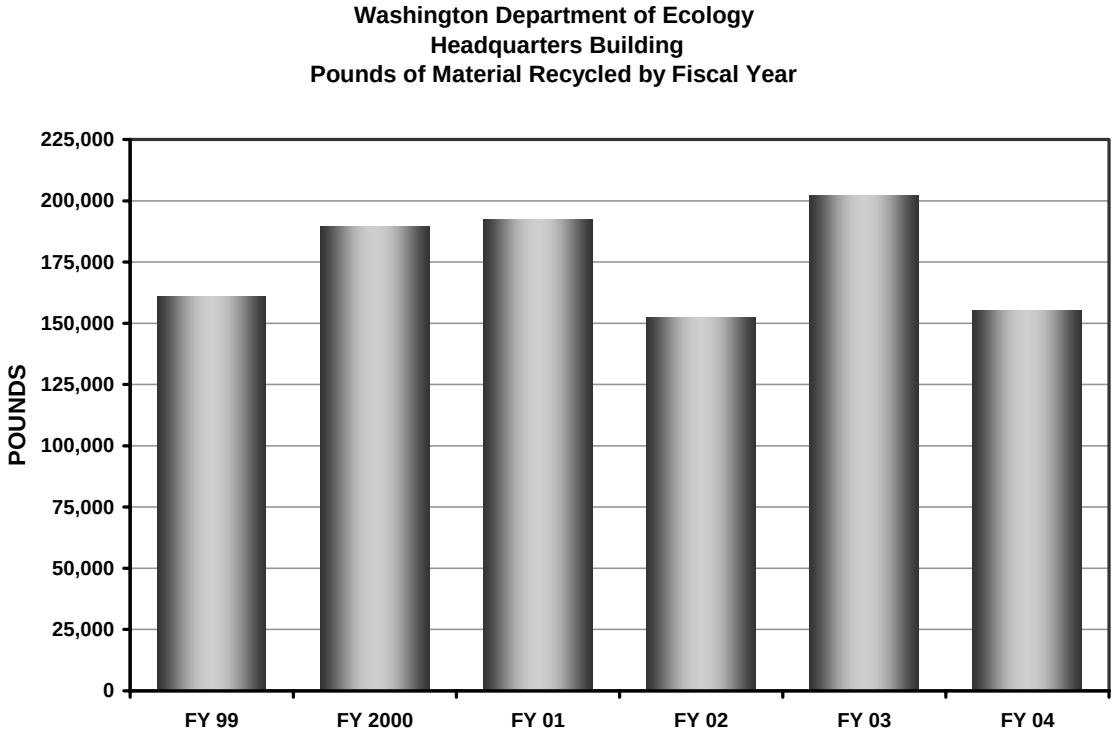
Administrative Services applied for and was accepted into the National Green Building Council (USGBC) Leadership in Energy and Environmental Design for Existing Buildings pilot project (LEED – EB). This is a new certification program being developed by the USGBC that recognizes excellence in ongoing management and improvements to existing buildings. A rigorous application package was required and submitted to the USGBC for their consideration. While Ecology has yet to receive certification, we understand that it will be awarded soon.

The headquarters building will be the first state building in Washington to receive the certification. We hope to seek certification for the other buildings that Ecology owns in the future.

Solid Waste Management

The agency remains committed to assuring recycling services are utilized when available at all facilities. The headquarters building was design with recycling stations throughout. All paper grades, corrugated containers, batteries, compact discs, floppy discs, Tyvek, film plastic, foam packaging, and some food wastes are being diverted for recycling. Building Services has been most aggressive in this area for the Lacey building and the results show in waste diverted.

Figure 3.2 Pounds of Materials Recycled at Ecology Headquarters Building



On-site Composting

Significant progress has been made on the development of a food waste and paper towel composting system for the headquarters building. 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. Ecology's Northwest Regional Office and Eastern Regional Office are also pursuing food waste composting projects. Ecology will be making significant progress on waste reduction via these projects and, at the same time, will be able to provide "how-to" information for other agencies and institutions.

The project is currently in the design stages. When operational, we expect to utilize the compost product on the building grounds and managed by the grounds maintenance contractor. This will further reduce our solid waste generation and the ongoing costs associated with disposal.

Energy Conservation

The agency continually seeks opportunities to reduce energy consumption at all of its facilities. The headquarters building in Lacey, Washington was built with the environment and energy conservation in mind. Even though it was built in the early 1990s, the building has features that are still considered leading edge. Here are a few of the features:

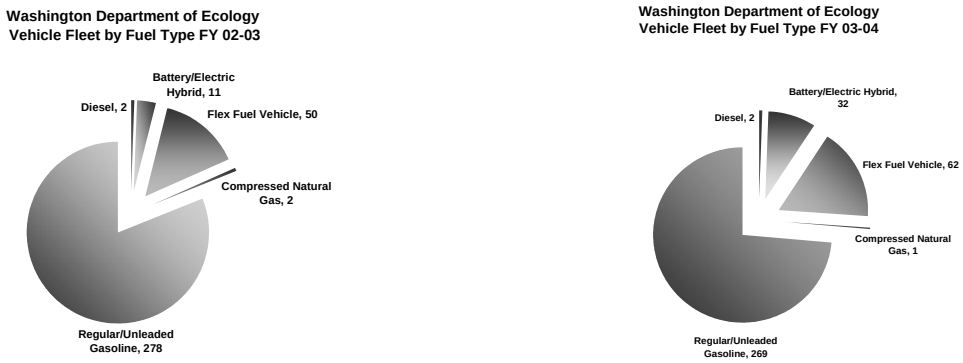
The building has a south facing orientation, taking advantage of passive solar energy gain; Day-lighting is part of the design, with an atrium down the middle of the building that provides natural light to the north half of the building, while south facing windows provide light to the southern half of the building; Lighting needs are monitored. When the sun is shining in, the electrical lighting in the building dims down; Double air-lock entries are on the main entrances to the building, reducing heating and cooling loses.

This past year the Eastern Regional Office was upgraded with energy efficient windows and the heating system was replaced. This will realize significant energy savings by that building over time.

Vehicle Fleet

The department's vehicle fleet is changing. Last biennium we were among the first agencies to purchase hybrid cars for staff to use. We have nearly tripled our hybrid fleet over the past year, increasing from eleven to thirty-two the number of hybrids available for staff use. As shown in the pie charts below, the agency has nearly tripled the number of hybrid vehicles in the fleet over the past year. Alternative fuel vehicles remain a key part of the fleet as well.

Figure 3.3 Number of Hybrid Vehicles in Ecology's Fleet



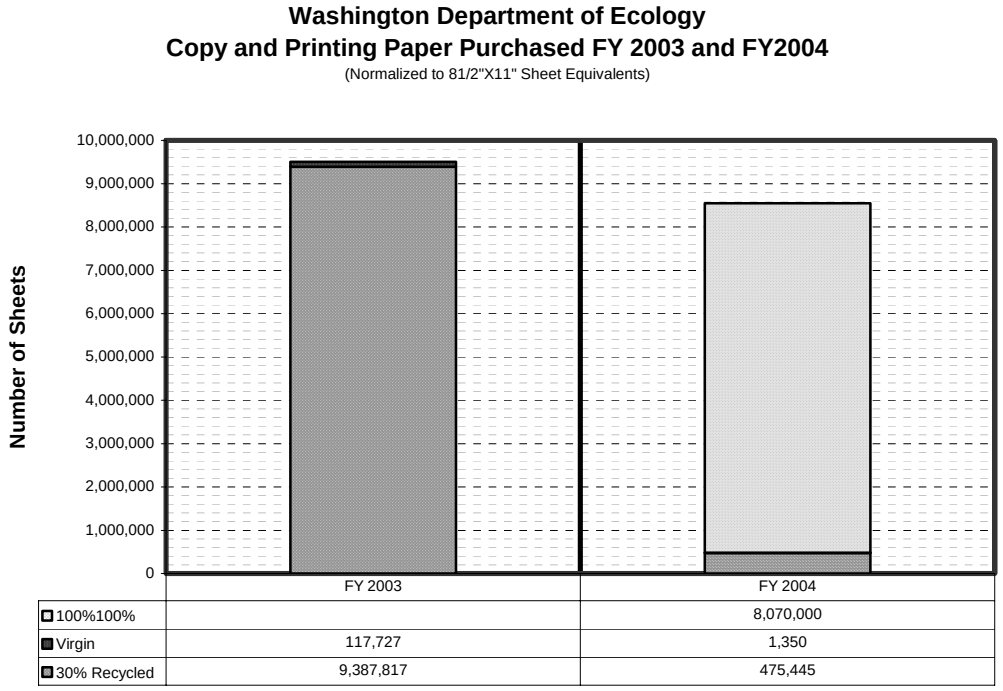
It is important to note here, that the federal flex-fuel requirements for fleets do no good here in Washington as alcohol blended fuels are not available. Simply buying a car because it is required while the intent behind that requirement can not be met makes no sense. The state should demonstrate some leadership in this arena and initiate whatever actions are necessary to exempt itself for this requirement.

The state would be better served by supporting the developing bio-diesel fuels industry in Eastern Washington using oil crops raised here in the state. We should procure vehicles with diesel engines that can burn that fuel, rather than the "flex-fuel" variety that we now purchase.

Procurement

100% post consumer recycled content copy and printing paper that is process chlorine free is now the standard paper used in the department's copiers and printers. The quality and function of the paper, made by Grays Harbor Paper in Aberdeen, Washington, has met all expectations. The paper has a slightly higher cost than the 30% recycled content paper that the agency was using. The agency has committed to reduce paper consumption in order to balance the additional cost with available funds. To cover the additional cost, the director issued a challenge to all employees to reduce the amount of paper used through duplex copying, utilization of electronic files for reviewing and editing draft documents and minimizing meeting handouts. The results are reflected below.

Figure 3.4 Ecology's Copy and Printing Paper Purchasing



Bio-Diesel

The headquarters building back-up power is provided by a diesel generator that is powered by a Detroit Diesel engine. The tank is four thousand gallons in size and the need to refill has not come about within the last year. The agency is committed to purchasing B20 bio-diesel when the tank is filled.

The Environmental Assessment Program operates a boat with a diesel engine. The program is seeking a source of bio-diesel to fuel that boat.

Program Plan Review

All annual and biennial program plans were reviewed for sustainability activities. While some programs explicitly identified work activities related to sustainability, all program plans contained activities that contribute to achieving the agency's third goal of Supporting Sustainable Communities.

Agency Strategic Plan

Worth highlighting, the agency's strategic plan, developed for the upcoming biennium, not only highlighted this sustainability plan, but has it fully integrated.

Beyond Waste

The Solid Waste and Financial Assistance Program and the Hazardous Waste and Toxic Reduction Program have been developing state waste management plans under the combined umbrella of "Beyond Waste." Beyond Waste starts with a shared long term vision for the state that moves us from a consume and dispose society to one that is based on materials management, in order to maximize utilization of resources. Beyond waste is rooted in the principles of social equity, economic well being and environmental stewardship. More can be read about Beyond Waste at http://www.ecy.wa.gov/beyondwaste/

Earth Day

Earth Day 2004 found Ecology celebrating the day in a different way from the past. The day was dedicated to employee training around sustainability. Keynote speakers included Dayna Baumeister from the Biomimicry Guild who spoke on the subject of Biomimicry and Alan Durning, Director of the Northwest Environment Watch who presented the "Cascadia Scorecard." There were breakout workshops as well covering topics like economic and the environment, sustainable agriculture, vermiculture composting and more. While the attendance was lower than hoped, those that did attend were fully engaged and supportive of like training in the future.

Sustainability Policy

The agency's new sustainability policy developed in response to the Governor's Executive Order received input from staff through the policy adoption process. Once adopted, the policy was sent by all staff by the director.

Ecology's Waste Reduction and Recycling Committee

As part of Ecology's Walk Our Talk initiative, there has been a great deal of work done to reduce the adverse impacts Ecology's staff and operations have on the environment

and the communities we live in. To accomplish this work, staff participate on several committees, including the Commute Trip Reduction, the Integrated Pest Management, and the Waste Reduction and Recycling Committees. Most recently, sustainability teams have formed in our regional offices.

The Waste Reduction and Recycling Committee (WRRC) goals are:

1. To improve the quantity and quality of our recyclable waste stream, and to reduce waste throughout the agency.
2. For the agency to behave internally in the manner we expect the external community to behave; and,
3. To be environmental stewards by integrating waste reduction and recycling into our work ethics.

WRRC accomplishments include:

- Continuing to implement Ecology's Model Waste Reduction and Recycling Plan, whose primary goal is to annually reduce waste and to recycle material generated at the Lacey facility.
- Assisting with the development of a plan to develop on-site composting for food and paper towel waste for Ecology's headquarters building.
- Conducting education to Ecology staff on paper reduction.
- Increasing the amount of 100% recycled, process-chlorine-free paper purchased by Ecology and other state agencies.
- Awarding several Waste Reduction and Recycling "Star of the Month" awards to highlight waste reduction and recycling efforts made by Ecology staff.

Our Daily Office Practices Meet Up With "Sustainability"

Northwest Regional Office Sustainability Team

For the year 2004, the Sustainability Team at the Department of Ecology's Northwest Regional Office (NWRO) has devoted each month to promoting a different issue related to sustainability. Starting in January, the Team addressed paper use reduction, recycling re-education, energy conservation, food waste composting, planting an organic garden, environmentally preferable purchasing, and organic food awareness. Their major accomplishments for January-August 2004 include:

- 18 people replaced their incandescent light bulbs with 18-watt compact fluorescent bulbs. That equals a savings of 1,026 watts of electricity, adding up to a significant savings over the lifetime of the bulb (8244 kwh), lasting ten times longer than a standard bulb.
- Developing a tracking mechanism for print jobs at Ecology in order to reach the 30% paper reduction goal.
- Installing a BioStack vermicomposting system for employee food scraps. This has diverted approximately 500 pounds of food waste and coffee grounds over four months.
- Planting employee garden and beginning yard waste composting preparations.
- Developing a rider board for carpooling to Lacey.
- Receiving a Commute Trip Reduction Metro Bus FlexPass for each employee and developing an incentive program for carpooling, bicycling, and walking to work.
- Re-educating about recycling procedures at the office.
- Measuring energy use of major appliances at office, purchasing and installing energy saving devices, and reminding people to turn off the lights.
- Lots of general education and employee recognition.

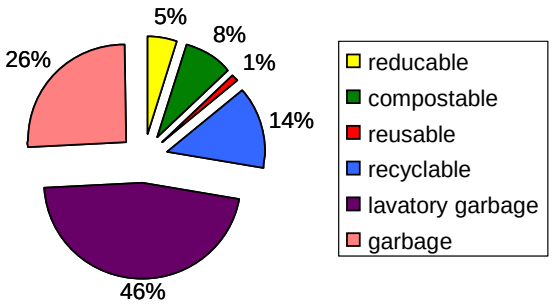
The team's purpose is to promote and establish state and agency recommendations to adopt sustainable practices at NWRO, as well as to provide unique, practical steps to achieve the goals stated in Executive Order 02-03 (see Ecology Sustainability Plan section above for details).

Sustainability projects in 2005 will tackle tracking CO_2 emissions, green energy purchase, and chemical use.

Central Regional Office Sustainability Team

In 2004, the Central Regional Office Sustainability Team worked on reducing waste, increasing recycling, and promoting sustainability. The Team's accomplishments for January through September 2004 include:

2004 Dumpster Dive Results



- Starting 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 2004, the Team has collected approximately 200 pounds of food scraps.

- Dumpster diving to learn what the office's waste stream and what they could divert. The Team waded through 88 pounds of garbage one morning and found that they could do a better job of getting recyclables, as well as food scraps, out of the garbage.
- Increasing the number of materials recycled in the office. The list has grown from mixed paper, cardboard, aluminum cans, and newspapers to include #1 and #2 plastics, magazines, paperboard, and glass.
- Purchasing environmentally friendly cleaning products including computer monitor cleaner, hand soap, and a general purpose cleaner.
- Brown bag lunches where staff can come listen, learn about, and discuss sustainability while eating their lunch.
- Creating a "Sustainability Cubicle," where staff can take unwanted office items and leave for other staff to use.
- Creating an "Availability Board" where staff can list items they have at home that they want to give away or trade for something in return.
- A "Sustainable Potluck," where staff members are encouraged to bring in food created from local, organic produce.
- All potlucks now have a zero waste theme, where reusable plates and utensils are encouraged via e-mail and at the potluck.

In 2005, the Team has set their sights on educating the office on energy conservation, environmentally preferred purchasing, and commute trip reduction.

Part of the dumpster dive team.

SW&FAP's Sustainability Cadre

The Solid Waste and Financial Assistance Program's Cadre has been busy creating a Sustainability Award for our staff. The cadre consists of a sustainability specialist from each region whose purpose is to assist staff in becoming more sustainable and to help the public with sustainable projects.

Cullen Stephenson, the SW&FAP Program Manager, is leading the group as the "sustainability champion" his job, along with the cadre, is to keep sustainability alive and continuously challenge our employees to become more sustainable.

In Eastern Region, the sustainability cadre member led a partnership with City of Spokane and two area non-profits to develop a multi-agency training in community sustainability indicators, their definition and use.

The Sustainability Award was created to do just that. It is given to staff members who have been nominated by their peers for taking the initiative to incorporate sustainability into their daily jobs. The recipient keeps the award for two months, and then hands it off to the next recipient. The categories for the Sustainability Award are:

- Commitment to Sustainability
- Trail Blazer
- Innovation
- Partnership
- Create your own category

The first award was given out on September 2004 to Jean Maust, Secretary Senior in the Statewide Resource Section of SW&FP. Jean received the award because of her dedication as an advocate of waste reduction and sustainable practices. She encourages staff to buy refills or reuse items rather than all buy new, to consider the purchase of recycled products, to print double-sided copies, to eliminate printing altogether when possible, and to use the worm compost bin for food scraps. Jean truly has shown a commitment to sustainability.

Chapter IV
Statewide Litter Prevention and 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 2004 focused on continuing the state's litter prevention campaign, "litter and it will hurt," initiating a new statewide litter survey to assess litter accumulation, and optimizing 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.**

State Focuses 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 uses 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.

In 2004, the campaign creative was redesigned to focus on two specific littering behaviors: tossing lit cigarette butts and not properly securing loads in trucks or on vehicles. These two behaviors were selected due to their prevalence and the very real hazards they create. Even though the campaign character from previous years, Torquemada, was retired, campaign messages continue to focus on enforcement and the fines associated with littering.

Campaign Background: The "litter and it will hurt" campaign strategies are 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. In 2003, the campaign turned to changing litters' beliefs: from a general apathy about littering to the view that people **do** care about littering, and that litterers **may** be caught. By focusing on specific fines in 2004, the campaign intended to heighten awareness of enforcement of littering laws, thereby influencing litters' behaviors.

Campaign Components

Media: New television and radio commercials were created that focus on tossing lit cigarette butts and not securing a load. The spots criticized the behavior, implied enforcement (with police sirens) and provided information about the respective fines. The two 15-second TV and two 30-second radio spots were broadcast statewide over two four-week periods, in a manner similar to the 2003 media campaign. All four spots can be reviewed online.[5]

As in 2003, in 2004 the media buy was focused on a young male target audience, as the spots aired almost exclusively on Fox Sports Northwest, during Seattle Mariner's games. Radio buys concentrated on the Mariner's Radio Network and several Spanish-language stations around the state. The new addition in 2004 was litter messages during radio traffic reports in the Seattle and Spokane markets.

Outdoor: As in 2003, the outdoor element dramatically increased campaign exposure. Whereas billboards in 2003 focused on the litter hotline phone number, new creative in 2004 focused on the fines for tossing a lit cigarette and not securing a load. Billboards (pictured above and below) were positioned throughout the summer and into the fall in Seattle, Tacoma, Spokane, Vancouver, and Wenatchee markets.

Road Signage: The Washington State Department of Transportation posted 136 large aluminum "litter and it will hurt" road signs across the state in 2002. Although WSDOT

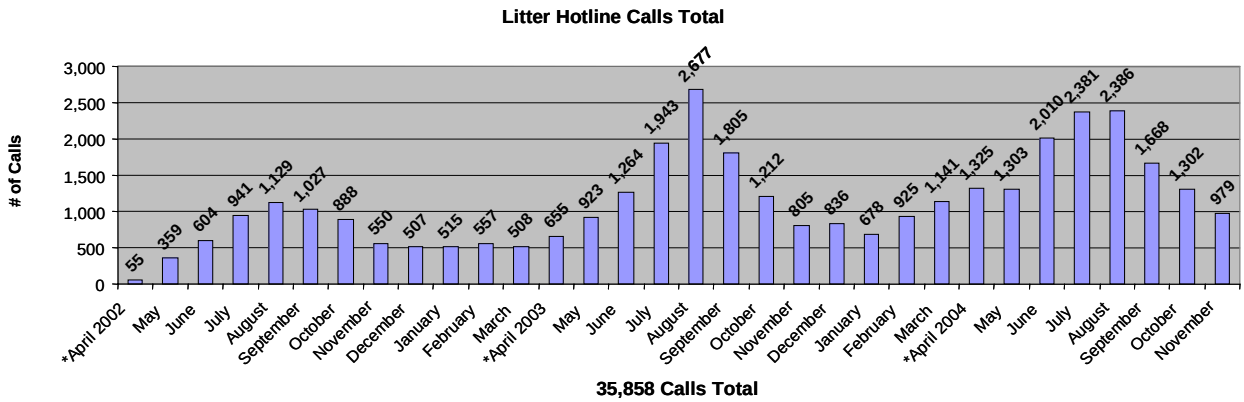
[5] http://www.ecy.wa.gov/programs/swfa/litter/c_media.html

did not add any signs in 2003 or 2004, local governments continue to manufacture and post the signs on county roads and local streets, furthering the campaign's reach.

Litter Hotline: The 24-hour litter hotline continued to ring off the hook in 2004. 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. Monthly call volume has increased since April 2002, as presented in the Figure 4.1.

Figure 4.1
Litter Hotline Calls



Website: Several items on the state's litter website[6] were updated in 2004. This website offers information about litter laws, fines, publications, various litter pickup programs, and statistics. A link to the campaign survey[7] was added to increase citizen participation. Pictures[8] of various litter clean-up sites show the typical terrain and litter encountered, as well as clean-up crews in action. The Litter Website continues to be a valuable reference for hundreds of people who request litter information each year.

[6] http://www.ecy.wa.gov/programs/swfa/litter/
[7] http://www.ecy.wa.gov/programs/swfa/litter/survey.html
[8] http://www.ecy.wa.gov/programs/swfa/litter/pictures.html

Enforcement: Washington State Patrol (WSP) is Ecology's primary partner for enforcing litter laws. In addition to helping manage the litter hotline, WSP supports the campaign message by issuing tickets and giving written or verbal warnings. At the time of this writing, WSP statistics from 2004 were not yet available, but in 2003, WSP issued 3,995 litter citations, a decrease from previous years. The 2003 citation data is presented in Table 4.1. More information on litter fines[9] can be found on the litter website.

Table 4.1
Litter-Related Violations Issued in 2003
by Washington State Patrol

Description	Arrest (Actual Ticket)	Written Warning	Verbal Warning	Total
Failure to secure load	274	181	898	**1353**
Debris escape	168	57	635	**860**
Uncovered load	26	18	94	**138**
Debris thrown	172	8	360	**540**
Debris lighted	322	8	774	**1104**
Total	**962**	**272**	**2761**	**3995**

Increasing the number of litterers ticketed is vital to the campaign's success, so Ecology must work more closely with the law enforcement community. One of the top recommendations from the November 2002 focus groups of city police, county sheriff departments, and state patrol officers was to conduct extensive outreach with officers themselves, educating them about the litter problem. Ecology has plans to produce a video by 2005 that can be distributed around the state to achieve this goal.

Distribution of Campaign Materials: Increases in littering fines that went into effect in July of 2003 rendered some previous years' campaign materials out of date. Litterbags were included in the list of materials printed with fine information and new bags were ordered with the updated fines. However, in the interest of sustainability, Ecology chose to donate the old bags to city, county, and community litter cleanup groups, getting them into the hands of those who could use and distribute them across the state. In all, Ecology donated 225,000 bags to various anti-litter contacts.

In addition, Ecology held other large, statewide bag distribution events. Campaign car litterbags were distributed at vehicle emission test facilities throughout the state. 51,000 litterbags were shipped or delivered to test facilities where workers offered them to all motorists passing through. Ecology also worked with the Washington State Department of Licensing to offer bags at their offices statewide. Besides spreading the campaign message, the litterbags are a good way to remind people to put litter in its place.

[9] http://www.ecy.wa.gov/programs/swfa/litter/fines.html

The new bags were sponsored by the Washington State Department of Health, the Washington Tow Truck Association, and the Pacific Science Center. In exchange for their sponsorship, Ecology "tagged" the litterbags with each group's logo or message.

Ecology Repeats Statewide Litter Survey

In the fall of 2003, the 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[10] 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. Several new sites were randomly selected.

The Ecology Youth Corps median crews, assisted by correctional crews and Washington State Dept. of Transportation (WSDOT) personnel, gave the 116 survey sites their meticulous initial cleaning in fall 2003. Litter taken from these sites was collected and disposed of by WSDOT in the usual manner.

Approximately five months later, in April and May 2004, the same crews took the *first sampling.* This time, litter from each site was bagged, labeled, and stored. In early June, roughly 13 tons of litter were sorted under contract with Cascadia Consulting Group and Sky Valley Associates at Spokane and Tacoma locations.

Crews made their *second and final sampling* of the survey sites in September and October 2004. Results from both samplings will be compiled and analyzed to calculate deposition rates and composition of the litter. Comparisons to the previous survey results will be made to better target litter prevention measures, evaluate collection efforts, and assess whether any laws or rules need to be revised. Please check the litter website[11] in spring 2005 to see information about the litter survey results.

Prevention Campaign Effectiveness Measures

SW&FAP is measuring the impacts of its litter prevention campaign in two ways: first, using intermittent telephone surveys to gauge the campaign's reach and effectiveness in raising awareness of littering; and second, conducting periodic litter generation and composition studies on selected sites statewide.

Telephone Surveys: Since 2002, telephone surveys have given Ecology feedback on how well campaign messages are reaching the population and how they may be altering

[10] http://www.ecy.wa.gov/biblio/0007023.html
[11] http://www.ecy.wa.gov/programs/swfa/litter/

beliefs and behavior about litter. Data continue to suggest that the State has made progress towards achieving the objectives of raising awareness, especially of the fine for tossing a lit cigarette butt. Telephone survey results provided to Ecology by Belo Marketing Solutions (conducted by Survey U.S.A.) are presented in Table 4.2. Results +/- 4.5% are considered significant.

Table 4.2
Comparison of Benchmark and Tracking
for the Litter Campaign

- **70% of respondents have seen or heard the slogan "Litter and it will hurt." Up from 14% in the benchmark study.**
- **39% of respondents are aware of a toll free number to report littering. Up from 20% in the benchmark.**
- **58% of respondents would say that fines for littering are very severe or severe. Up from 31% in the benchmark.**
- **46% of respondents remember seeing or hearing any advertising, news or public messaging about the fine for littering a cigarette butt. Up from 30% in the benchmark.**
- **Results indicate that television and road signs are effective in getting the litter message out. When asked where they most remember seeing litter messages, respondents answered road signs first (91%), and television second (69%).**

Litter Generation and Composition Studies: One of the comparisons from the current and previous litter surveys will attempt to measure the impact of the litter prevention campaign in terms of how much litter is discarded in each of the study years. The chance of detecting a statistically significant change in the amount of litter is slim; especially since the campaign has only been in effect three years. Unfortunately, behavior-changing campaigns can sometimes take decades to have a measurable impact (consider the seatbelt and anti-smoking campaigns). Nonetheless, each litter survey will give Ecology data that can be used to establish a trend line in future years.

Litter Program Fund Allocation

Significant portions of the Waste Reduction, Recycling and Model Litter Control Account (WRRMCLA) support litter and illegal dump cleanup on public roads and lands through variety of programs. The legislation (Chapter 70.93 RCW) directs fund allocation as follows: twenty percent to run the Community Litter Cleanup Program (CLCP), thirty percent to fund waste reduction and recycling efforts within Ecology, and fifty percent 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 this fifty percent as well.

For the current biennium (July 2003 – June 2005), the appropriation from the WRRMCLA 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**

The $6.21 million dedicated to clean-up efforts and prevention was allocated as follows:

Operation of Ecology Youth Corps	$2.94 million
Other state agencies	$1.03 million
Prevention campaign/litter survey	$0.83 million
Agency overhead	$1.10 million
Administration & coordination	$0.31 million
Total	**$6.21 million**

Ecology Youth Corps

2004 marked the 29th year of operation for the Ecology Youth Corps (EYC). The Ecology Youth Corps[12] 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 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 summer.

Youth crews consist of 14-17 year old youth who principally clean shoulder areas and interchanges of major state routes and interstates. Additional work occurs on county roads, the departments of Natural Resources and Fish & Wildlife recreation and access sites, and other public areas. Over 2,000 youth 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.

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

This fiscal year (July 2003 – June 2004): A significant portion of median crew effort this year was devoted to the state's litter survey. This work began in late summer 2003 with verifying and re-marking each site, measuring and mapping all new sites, and thoroughly cleaning each of these randomly selected roadways throughout the state. In the spring, all collected material was tagged by site and taken to storage areas for sorting (please refer to the section on the litter survey earlier in this report).

The unusual level of cleaning (collecting broken pieces of glass and thousands of cigarette butts), as well as, the additional time to travel, transport, and tag survey material; significantly impacted the EYC median crew's operational efficiency.

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

CRO:	Benton	Chelan	Douglas	Kittitas	Klickitat
	Okanogan	Yakima			
ERO:	Adams	Asotin	Columbia	Ferry	Franklin
	Garfield	Grant	Lincoln	Pend Oreille	Spokane
	Stevens	Walla Walla	Whitman		
NWRO:	Island	King	Kitsap	Skagit	Snohomish
	Whatcom				
SWRO:	Clark	Cowlitz	Grays Harbor	Lewis	Mason
	Pacific	Pierce	Skamania	Thurston	Wahkiakum

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

- 86,280 hours worked
- 1,026,923 pounds (513.5 tons) collected
- 4,403 miles cleaned
- 331 acres cleaned

Eight-percent of all material collected by the crews was recycled – about 40.3 tons. This included:

- 15,428 pounds of aluminum
- 33,203 pounds of glass
- 21,722 pounds of scrap metal
- 10,234 pounds of plastic and other miscellaneous materials

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.

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 government 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 4.3.

Table 4.3
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

In the fourth cycle, $2.73 million was dedicated to the program, with each recipient eligible to receive approximately $66,600. The Legislature directed another $250,000 to the CLCP program, bringing the biennial total to $2.98 million. Not all eligible jurisdictions applied for the supplemental funding. Table 4.4 below highlights the work accomplished during the entire fourth cycle and ***half*** of the 5th.

Table 4.4
Statistics from the Community Litter Program
July 2001 – June 2004

	July '01-June '03 *Represents 2 years of data*	July '03-June '04 *Represents 1 year of data*
Volunteer Hours	49,815	25,934
Correctional Crew Hours	286,007	129,359
Supervisor Hours	78,907	39,441
TOTAL HOURS	**414,729**	**194,734**
Road Miles Cleaned	69,189	27,701
Acres Cleaned	38,183	6,010
Number of Specific Dump Sites Cleaned Up	6,093	4,689
Pounds of Litter Picked Up	4,724,110	2,166,765
Pounds of Illegally Dumped Materials Picked Up	3,419,227	2,033,700
Pounds of Material Recycled	1,020,256	331,784
TOTAL POUNDS	**9,163,593**	**4,532,249**

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.

For the *fifth* cycle, $2.94 million was awarded to 41 entities, with all eligible jurisdictions participating. The $2.94 million includes $186,000 that in previous biennia went directly to Department of Corrections (DOC). As a pilot project this cycle, the money was included in the CLCP agreement of the jurisdictions in which the DOC crews work. For more information please see the DOC section of this report.

A major change was also 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 current 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 county would be left out. Many believe the new allocation system is more equitable. It will be evaluated at the end of the cycle.

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.

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 4.5 below. The amounts available to the other state agencies have declined somewhat as funds were shifted to prevention activities.

Table 4.5
Interagency Agreements between Ecology and
Other State Agencies for Litter Activities
July 1, 1999 – June 30, 2005

Agency	FY00/01	FY02/03	FY04/05
Dept. of Corrections	$492,000	$466,000	$450,000
Dept. of Natural Resources	$497,000	$468,000	$455,000
Dept. of Natural Resources (supplemental)	$0	$500,000	$0
Dept. of Transportation	$78,000	$70,000	$70,000
Parks & Recreation	$30,000	$26,000	$45,000
Held in Reserve	$0	$0	$10,000
TOTAL	**$1,097,000**	**$1,530,000**	**$1,030,000**

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 provides $264,000 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. This year, 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. For more information please refer to the "Community Litter Cleanup Program" section of this report. The money for the crews was included in Ecology's CLCP contracts with Seattle Public Utilities and Kittitas County, replacing Ecology's separate contracts with these crews. This pilot is an attempt to streamline contract paperwork and simplify reporting requirements for the crews.

Table 4.6 summarizes activity of DOC crews included in the interagency agreement (Seattle and Ellensburg activity is reported with CLCP data in the CLCP section of this report).

Table 4.6
Department of Corrections Litter Removal Activity
July 1999 – June 2004

	FY00	FY01	FY02	FY03	FY04
Hours of Work (supervisor and offender)	50,719	54,296	44,086	43,014	24,633
Pounds of Litter & Illegally Dumped Materials Removed	621,062	833,549	682,029	880,105	287,494
# of illegal dump sites cleaned	345	553	406	831	12
Miles of road cleaned	6,185	5,537	2,969	2,714	1,230
Acres cleaned	2,203	3,088	1,463	2,257	1,182

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 4.7, 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 $400,000 for part-time crews at the following camps: Naselle, Larch, Cedar Creek, Monroe, Olympic, Airway Heights and the Washington Correction Center for Women. In FY04/05, $55,000 was devoted to contracted and volunteer crew activities.

Table 4.7
Department of Natural Resources Litter Removal Activity
July 1999 – June 2004

	FY00	FY01	FY02	FY03	FY04
Hours of Work (supervisor and offender)	22,114	33,493	41,992	53,477	18,990
Pounds of Litter Removed	104,603	143,189	168,539	1,102,303	64,520
Pounds of Illegally Dumped Materials Removed	192,116	399,087	552,251	1,178,646	217,558
# of illegal dump sites cleaned	174	535	516	758	368
Miles of road cleaned	1,282	3,269	2,554	389	839
Acres cleaned	161	122	107	1,752	125

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 ($70,000) to offset the costs of disposal. Table 4.8 summarizes the litter work accomplished by Transportation crews.

Table 4.8
Department of Transportation Litter Removal Activity
July 1999 – June 2004

Time Period	Amount of Litter Disposed (Cubic Yards)
FY00	10,349
FY01	19,738
FY02	13,757
FY03	21,607
FY04	26,793
Total	**92,244**

Data provided by WSDOT

In 2003, Washington's governor requested that cabinet agencies make staff cuts beyond what was prescribed during the legislative session. These additional cuts were to take effect in the current biennium, which began on July 1, 2003. In support of the Governor's request, Ecology management decided to 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.

SW&FAP staff approached the State Maintenance Engineer at WSDOT. WSDOT agreed to assume the supervisor positions, for a one season trial. The interagency agreement between Ecology and WSDOT, covering EYC activities in 2004, stipulates that Ecology retain responsibility for funding and program oversight and implementation, while WSDOT is technically the EYC supervisors' employer.

This new arrangement is currently being evaluated (late 2004). WSDOT and Ecology are proceeding to amend the interagency agreement for 2005, continuing to work together in support of the EYC Program. There were additional administrative costs associated with the agreement and issues resulting from the agencies' differing personnel procedures. Attempts will be made to address the concerns in the new agreement, but if issues cannot be overcome, Ecology will explore other options, or request reinstatement of the positions at Ecology.

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. For the FY04/05 agreement, Ecology provided $45,000 to fund activities including disposal of illegally dumped materials, continued recycling and waste reduction programs, distribution of campaign litterbags, and support of a pet waste disposal program.

This year, National Shore Patrol volunteers removed 33,620 pounds of waste as part of the Washington State Parks volunteer program. In addition, Ecology funding was used in 2004 for special projects like Riverside State Park's purchase of a special container for properly storing illegally dumped oil and the Fort Casey and Moran State Parks' interpretive trails that offer hikers information about composting. Finally, Ecology provided 45,000 free litterbags that were distributed to guests of the state parks.

Looking Ahead

Washington State litter programs seem to be making a difference in our state. Awareness of litter issues and the fines associated with littering has increased due to the campaign. And litter and illegal dump clean-up numbers have held fairly steady, parallel to funding available for those activities. Anecdotally, Ecology staff have heard from several organizations that feel a backlog of illegal dumps have finally been addressed, and efforts are now focused on keeping up with new dumping. But the casual observer may not be able to detect a difference in the amount of illegally dumped materials or the amount of litter on Washington's roads.

Next year SW&FAP plans to take the time to examine our work over the past three years. A thorough evaluation of the campaign coupled with the new litter survey results should help the agency plan future activities. Prevention and clean-up efforts will certainly continue through this process. In 2005, the focus of the campaign will be on enforcement; specifically regarding unsecured loads and lit cigarette butt litter. Plans include the production of a video for the law enforcement community, development of a brochure about unsecured loads, and a pilot enforcement emphasis period. Ecology will continue to work with other state agencies, businesses, and private organizations to further the campaign and litter prevention messages. Only time will tell if Ecology's efforts have a significant impact on the amount of litter in Washington.

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 2003, there were 159 cities and county unincorporated areas offering curbside collection of recyclable materials such as glass, paper, and metals while 123 of those cities and county unincorporated areas (77% out of those 159) 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 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 2003, the diversion rate was 47%. (See Table 5.1.)

Table 5.1
Recycling and Diversion Rates
1986 to 2003

Year	Recycling Rate	Diversion Rate[13]
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%

[13] 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.

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, 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

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[14] 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.

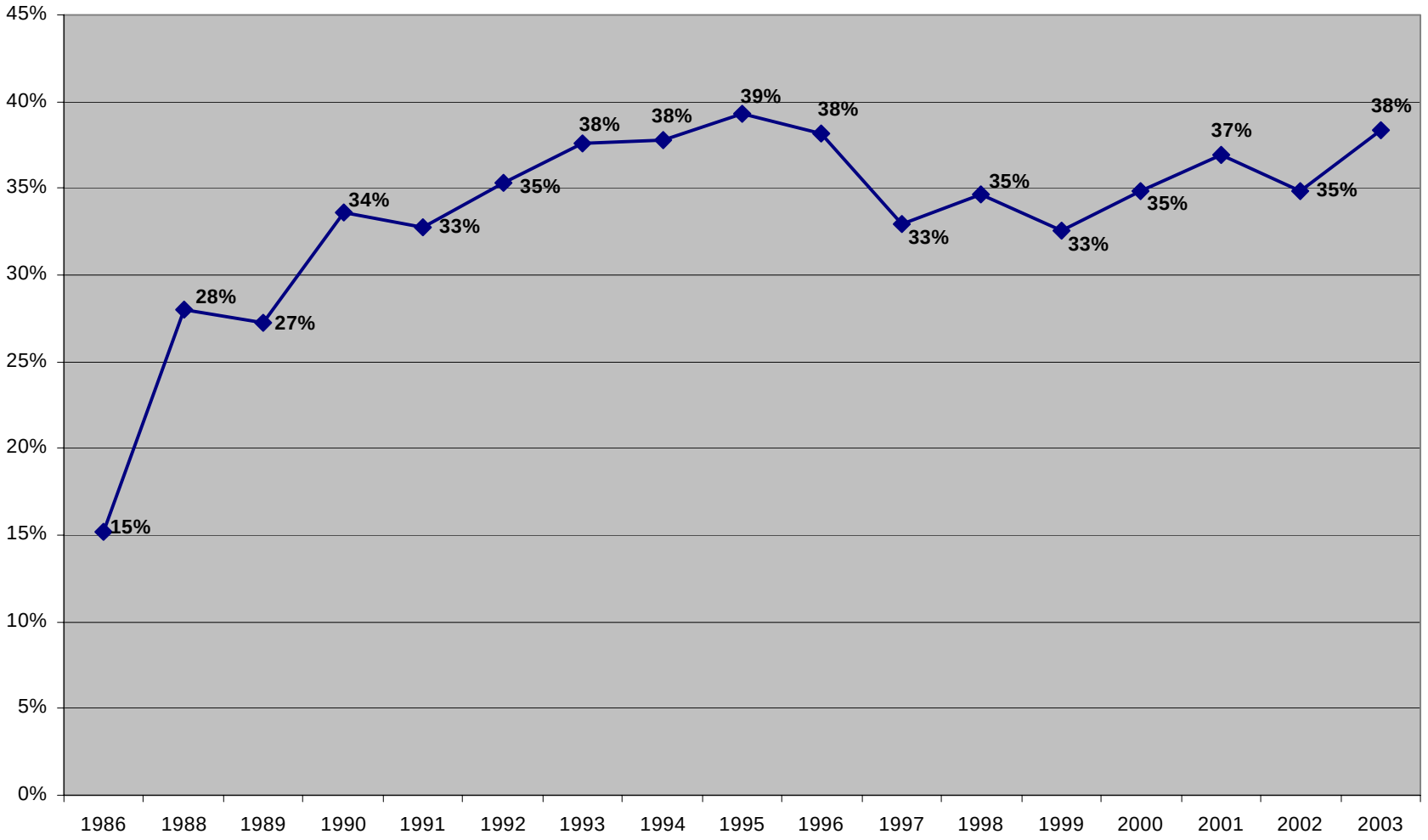
The poor paper and metal market trend continued in 1998, but improved enough to raise Washington's recycling rate to 35%. Although markets improved in 1999, the tonnage disposed of increased enough to drop the recycling rate to 33%. Markets continued to improve in 2000, raising the recycling rate again to 35%. Although markets for most materials fell in 2001, the 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 have resulted in better reporting of recyclables. Additionally, the market demand for ferrous and nonferrous metals was high during 2003, which has aided in bringing the recycling rate up to 38%. (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/.

Although cities and counties have built an extensive collection infrastructure initiated by the "Waste Not Washington Act" of 1989, recycling rates have not reflected this availability of recycling as much as expected. Some of the factors that could be influencing the trend include diminishing education on recycling and resulting lack of

[14] 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.

Figure 5.1
Washington State Recycling Rate - 1986 to 2003



concern, diminishing concern over landfill space, convenience and cost of recycling, more disposable income (thus more spending on consumer goods), product/packaging design, low landfill tipping fees, increased waste generation in the commercial sector, and low demand for recycled materials to close the recycling loop.

Another important factor which has influenced the recycling rate in the past 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, were also asked to report their recycling for 2003, through the annual recycling survey.

As of this writing, 81.5% 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 over 600 thousand new people since 1995. The 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, and this trend was particularly 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."[15]

Recycling in the commercial sector increased by 4% in 2003.[16] Based on tonnage figures reported by recyclers who provide service to the nonresidential sectors, these programs seem to be highly successful in diverting large volumes of materials away from disposal, and they do so with minimal government regulation or oversight. Economic incentives are providing the encouragement for businesses to reduce their waste output through recycling.

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.[17] 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 parallel to the traditional “recycling” rate. The diversion rate is calculated by measuring non-MSW recyclables (diverted materials) along with MSW recyclables, and then comparing the resulting figure to total waste generation, which includes all MSW and non-MSW waste types whether they are disposed of, diverted, or recycled.[18] Washington shows a diversion rate of 47% in 2003. (See Figure 5.2.)

The methodology for measuring these diverted materials is as simple as collecting the number of tons of material that are going to beneficial use as opposed to disposal. 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.

---

[15] 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.

[16] This measure of commercial-sector recycling includes diverted and recycled material types and is based on a commercial/residential breakdown as reported by facilities.

[17] 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.

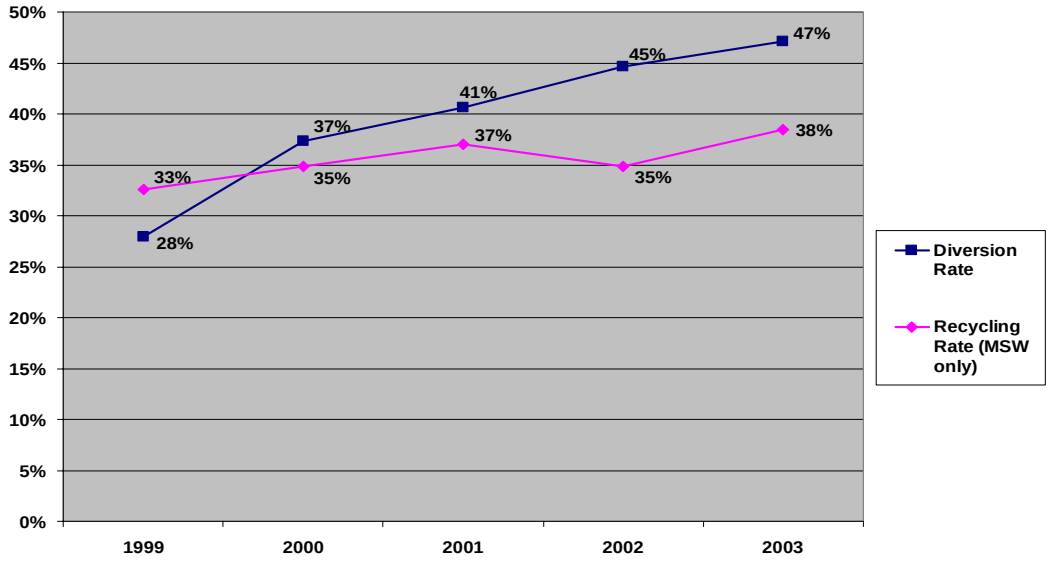
[18] Waste types used to calculate diversion include municipal, demolition, inert, commercial, wood, tires, medical, and other. Excludes industrial wastes, asbestos, sludge and petroleum contaminated soils.

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. King County,[19] the City of Seattle, and Clark County have all done sampling of this waste stream and have comparable results.

Wood waste is another large waste stream in Washington, and an increasing percentage of it is being used in new wood and paper products, as a feedstock in composting operations, and as mulch. A large portion of wood reported as "recycled" is destined to be burned for energy recovery or to be used as "hog fuel." In 2002, Ecology began to account for the portion of reported recovered wood that is burned and to measure it as a diverted material.

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 Recycling & Diversion Rate - 1999 to 2003



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

[19] *Waste Monitoring Program: Construction, Demolition & Land Clearing Waste*, King County Solid Waste Division, January 1995.

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.[20]

Process – 2003 Recycling and Diversion Measurement

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. The annual reports received from recycling facilities for 2003 were fairly timely and complete, resulting in better information than in years past. Since reporting on the recycling survey portion of the measurement tool is not mandatory, and 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, which can affect the accuracy of the survey. These factors make it very difficult to compile good recycling and diversion information for specific counties. The difficulties also create 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

[20] 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.

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 and provide their input. Finally, figures are checked against double-counting by verifying exchange of materials between reporting entities.

Beginning in January of 2004, for the 2003 reporting year, both the recycling survey forms and the annual reporting forms along with instructions 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 entered into the off-line database. This step provides a crucial double check in maintaining integrity of the data.

Results – 2003 Recycling and Diversion Measurement

For consistency in comparing results from year to year, Ecology continues to include the same materials in the calculation of the recycling rate that have been included since 1986. The materials included in the 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 recycling rate from 2000 to 2003.

Other materials are surveyed and reported; however, the inclusion of these materials in the 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. Ecology collects information on these other materials, terming them "waste diversion." For the most part, these materials are collected and processed outside of the traditional residential and commercial waste stream and were not addressed in the Waste Not Washington Act of 1989. 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 for more beneficial use. For materials measured that were not included in the recycling rate, or "diverted" materials, for 2000 through 2003, the materials in Table 5.3 were reported.

Table 5.2
Recycled Material Tonnage Reported
Calculation of Recycling Rate[21] 2000-2003

Recycled Material	2000	2001	2002	2003
Aluminum Cans	17,945	12,540	12,718	**17,608**
Computers & Parts	255	317	1,414	**3,587**
Container Glass	84,062	81,632	64,937	**74,126**
Corrugated Paper	495,470	491,230	417,534	**430,750**
Ferrous Metals	357,220	254,104	432,778[22]	**709,881**
Fluorescent Light Bulbs	160	346	417	**772**
Food Waste	73,895	193,024[23]	70,904	**100,755**
Gypsum	36,692	29,883	51,089	**76,946**
HDPE Plastics	5,491	4,841	6,029	**8,485**
High-Grade Paper	59,976	58,538	62,312	**59,502**
LDPE Plastics	4,032	6,603	9,775	**17,925**
Milk Cartons/Drink Boxes-Tetra	98	69	26	**1,789**
Mixed Paper	273,494	231,302	206,051	**219,111**
Newspaper	219,716	176,392	187,585	**215,882**
Nonferrous Metals	51,273	41,615	61,240	**114,604**
Other Recyclable Plastics	6,512	4,067	949	**3,482**
Other Rubber Materials	55	374	166	**5**
PET Plastics	5,100	4,661	5,886	**6,060**
Photographic Films	6	87	517	**530**
Textiles (Rags, Clothing, etc.)	15,961	10,127	9,440	**15,497**
Tin Cans	22,632	11,483	9,417	**9,492**
Tires	12,218	10,306	27,102	**27,753**
Used Oil	8,353	38,288	43,367	**56,344**
Vehicle Batteries	10,757	16,297	12,158	**18,780**
White Goods	35,427	39,180	43,833	**53,353**
Wood	215,211	538,242[24]	394,261[25]	**208,920**
Yard Debris	450,761	448,222	380,882	**546,487**
Total Recycled	**2,462,772**	**2,703,772**	**2,512,788**	**2,998,428**
Total MSW Disposed[26]	**4,610,914**	**4,611,406[27]**	**4,703,879**	**4,805,202**
Total MSW Generated	**7,073,686**	**7,287,025**	**7,216,667**	**7,803,630**
Recycling Rate	**35%**	**37%**	**35%**	**38%**

[21] Detail may not add due to rounding.

[22] Increase can be attributed to greater reporting from recyclers.

[23] Increase attributed to a combination of actual increase in food waste collection and increased reporting from recyclers.

[24] Increase attributed to a combination of actual increase in wood waste collection and increased reporting from recyclers.

[25] Decrease can be attributed to breaking down into more detailed categories of uses of wood (i.e., wood for energy recovery is tracked, but not included in this number). (See diversion numbers in final section of this chapter.)

[26] The amount of material disposed of represents only the quantity defined "recyclable portion" of the waste stream and excludes industrial, inert, asbestos, biosolids, petroleum contaminated soils, and construction, demolition and landclearing debris disposed of at municipal solid waste landfills and incinerators.

[27] Figure corrected for error in Whatcom County disposal.

Table 5.3
Diverted Material Tonnage Reported
Calculation of Diversion Rate[28] 2000-2003

Diverted Material	2000	2001	2002	2003
Antifreeze	2,475	4,157	4,506	**4,722**
Ash, Sand & Dust used in Asphalt Production	10,000	12,333	290	**10,576**
Asphalt & Concrete	893,218	1,116,871	1,451,959	**1,600,288**
Carpet and Pad	97	820	148	**258**
Composting Furnish	89,678	91,495	67,338	**36,049**
Construction & Demo. Debris[29]	376,684	131,922	131,701	**143,844**
Food Processing Wastes	N/A	N/A	N/A	**3,774**
Household Batteries	39	38	333	**143**
Industrial Batteries	738	N/A	5	**30**
Landclearing Debris	N/A	151,464	286,201	**160,158**
Mattresses	N/A	N/A	77	**N/A**
Miscellaneous	374	16	N/A	**40**
Oil Filters	835	5,942	5,023	**1,750**
Other Fuels (Reuse & Energy Recovery)	N/A	N/A	121,349	**2**
Paint	40	87	434	**389**
Post-Industrial & Flat Glass	N/A	N/A	2,364	**2,976**
Post-Industrial Plastics	N/A	N/A	8,118	**N/A**
Reuse (Clothing & Household Items)	524	601	79	**918**
Reuse (Construction & Demolition Items)	1,257	1,975	76,629	**11,927**
Reuse (Miscellaneous)	198	334	310	**7,488**
Roofing Material	14,412	11,727	13,825	**6,493**
Tires (Burned for Energy)	N/A	N/A	2,818	**9,664**
Tires (Retreads)	N/A	1,009[30]	1,170	**12,976**
Topsoil	22,812	N/A	N/A	**228,202**
Used Oil for Energy Recovery	33,021	19,786	30,838	**15,580**
Wood Fiber/Industrial Paper	N/A	N/A	N/A	**13,767**
Wood for Energy Recovery	121	12,460	196,100	**189,584**
Total Diverted	**1,446,522**	**1,563,035**	**2,401,615**	**2,461,597**
Total Recycled	**2,462,772**	**2,703,772**	**2,512,788**	**2,998,428**
Total MSW Disposed	**4,610,914**	**4,611,406[31]**	**4,703,879**	**4,805,202**
Other Wastes Disposed[32]	**1,966,188**	**1,620,745**	**1,380,396**	**1,316,850**
Total Waste Generation	**10,486,396**	**10,498,958**	**10,998,676**	**11,582,076**
Diversion Rate	**37%**	**41%**	**45%**	**47%**

[28] Detail may not add due to rounding.

[29] Includes landclearing debris in 1999 and 2000.

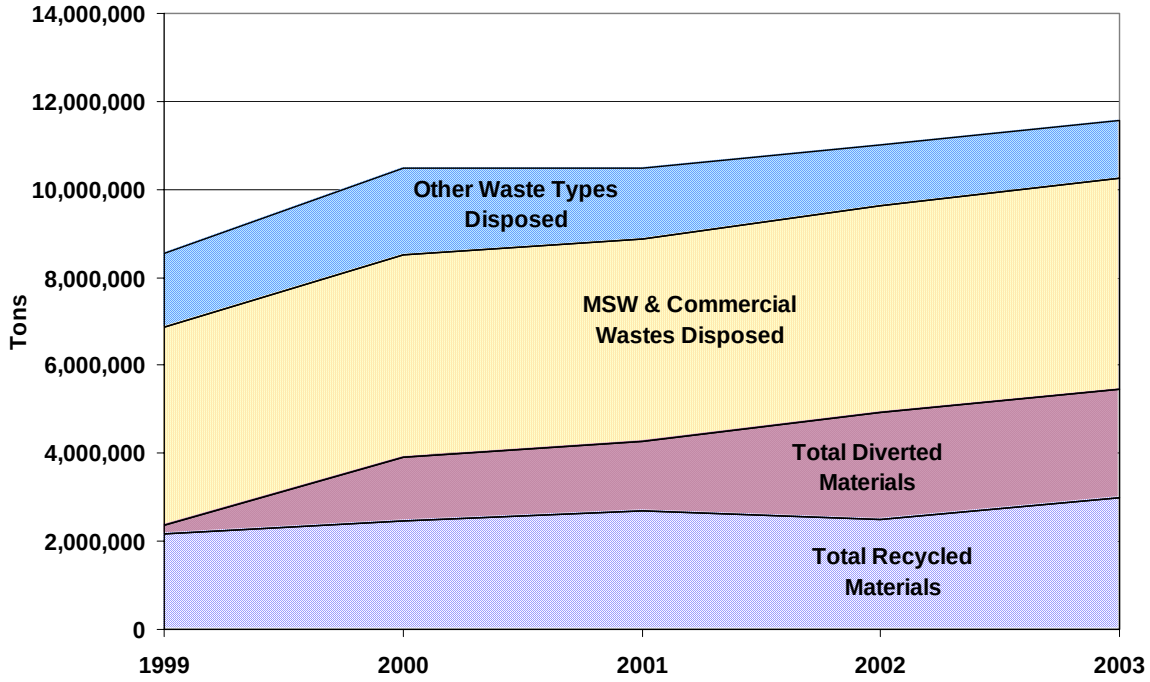
[30] Includes tires burned for energy.

[31] Figure corrected for error in Whatcom County disposal.

[32] "Other wastes" includes demolition, inert, wood, tires, medical waste and other wastes. It excludes industrial wastes, asbestos, sludge, petroleum contaminated soils.

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

Figure 5.3
Washington Waste Generation – Disposal and Diversion[33]



Recycled Materials and Markets[34]

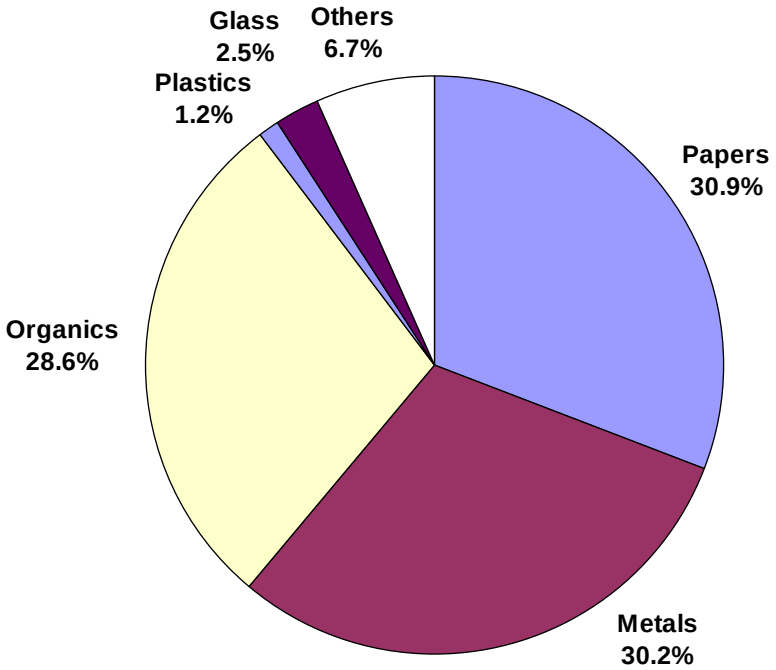
There are essentially three factors that have caused the increase in the recycling rate for 2003. They are increased markets for key materials, additional yard waste collection programs, and increased reporting of key materials. The markets for ferrous and nonferrous metals rose greatly in 2003, due to the high prices for these commodities. Paper markets are making a slight recovery from the downturns of the previous two years. The collection of yard debris is experiencing an upturn due to the markets and there have also been more yard waste collection programs started around the state. Finally, 2003 was the first year that reports have been required from certain recycling facilities in Washington, due to implementation of the requirements of chapter 173-350 WAC, *Solid Waste Handling Standards*. This rule allows identified recycling facilities to be exempt from solid waste permitting if they fulfill certain requirements, one of which is reporting annual tonnages to the Department of Ecology and local jurisdictional health departments.

[33] "Other waste types" includes demolition, inert, wood, tires, medical waste and other wastes. It excludes industrial wastes, asbestos, sludge, petroleum contaminated soils.
[34] The detail in this section refers to MSW recycling with some references to diverted materials.

In a few recent years, the lag in the actual collected amounts of "traditional" recyclable materials, such as mixed paper, glass, and cardboard, would show that economic and environmental policies are not yet in full alignment with regard to recycling. For example, market prices for both virgin and recycled materials do not always reflect the full societal and environmental costs associated with obtaining and processing those materials. Distortions such as subsidies can affect the economic competitiveness of recycling. This is true for all aspects of recycling, including transportation of recyclables to market. Government policies and regulations can play a significant role in ensuring that the prices of virgin and recycled commodities reflect their actual environmental and societal costs.

The recycled materials stream breaks down to six general categories. (Figure 5.4.) Paper remains for the second year as the greatest portion of the recyclable stream at 30.9%. Metals come in a close second at 30.2%. Organic materials (including yard debris, wood, and food waste) make up 28.6% of the total recycled. The other categories make up just 10.4% of the total collected: glass accounts for 2.5%, plastics for 1.2% and others for 6.7% of the total. "Others" includes materials such as recycled tires, used oil, batteries and textiles. (See Table 5.2 for a complete list of material categories.)

Figure 5.4
Recycled Materials Stream – 2003



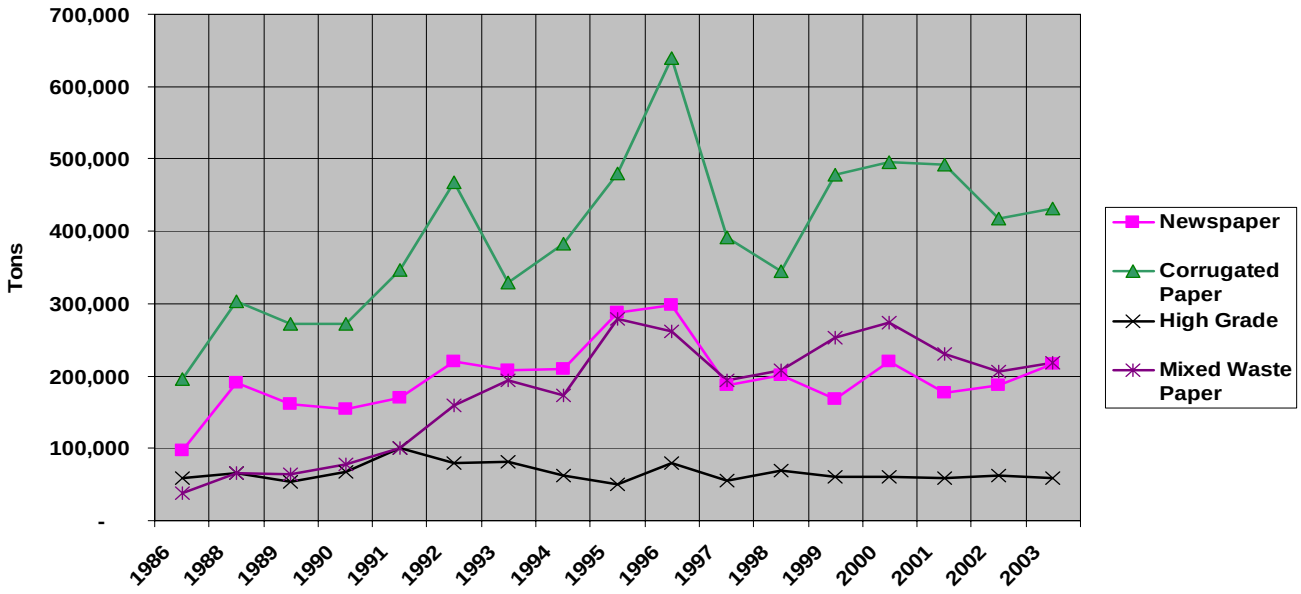
Recovered Paper

Paper is the dominant category in the recycled materials stream. (See Figure 5.4.) Paper's percentage of the total recyclables, however, dropped by almost 4%, from 34.8% to 30.9%. Even though there was an increase in the tonnage of paper collected, the

overall percentage decrease of the paper category can be attributed to the large increase in the percentage of the total held by the metals category. In 2003, foreign markets showed high demand for recovered paper, although domestic markets did improve over 2002. Figure 5.5 shows the increase in paper recovery for 2003.

The market for corrugated paper shows some recovery after a drop in mid-2000 that continued through 2002. Recovered corrugated paper increased by 13,216 tons or 3% in 2003. Mixed paper recovery increased by 6% to halt the 2-year decline of 2000 to 2002. High-grade paper saw a slight decrease from 2002 totals. Out of all the paper products, newspaper, with a 15% increase over 2002, has had the largest increase in recovery. Newspaper recovery has fluctuated after an all-time high of collected tons in 1996.

Figure 5.5
Paper Products Recycling 1986 to 2003



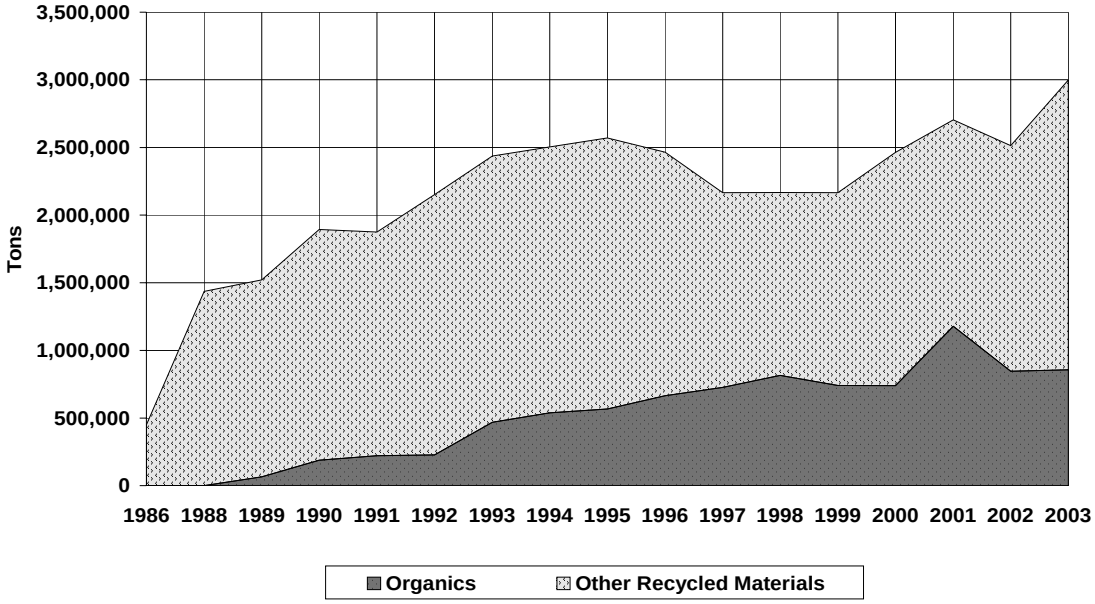
Organic Materials

Organic materials held 28.6% of the total recycled materials share, moving it into third position for 2003. (See Figure 5.4 and Figure 5.6.) This category is made up of yard debris, wood, and food wastes. Over the years, paper has generally been the dominant material category; however, in 2001 organics topped the list due to the great amounts of recycled wood reported. Recyclers have since been asked to categorize wood differently, indicating amounts that are burned for energy. Only wood that is "recycled" into composite lumber or composted is included in the recycling rate. Prices in the end-use markets for scrap wood fluctuate, which varies the amounts reported. Wood reported as recycled decreased by 47% in 2003.

Until 2001, yard debris had dominated the organics stream in the recycling survey. (See Figure 5.7.) 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 as the dominant organics category.

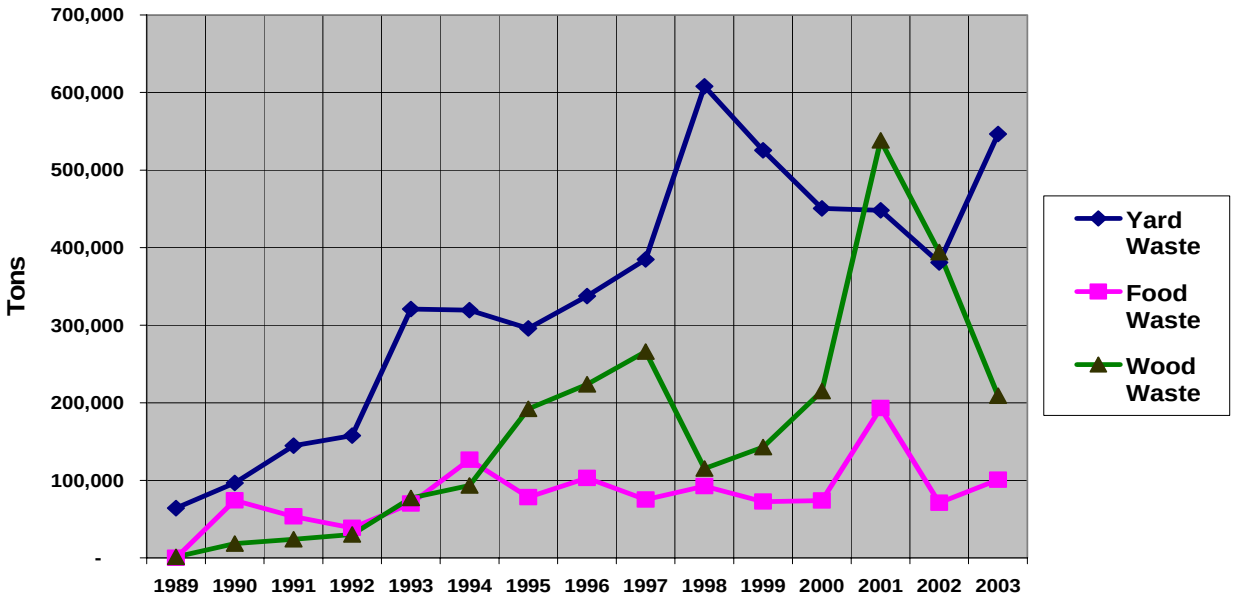
Figure 5.6
Organics Proportion of Total Recycling 1986 to 2003
Yard Debris, Wood and Food Wastes



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 capture 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 food waste category, including rendering of fats and oils, increased in 2003. The increase is partly attributed to reporting for this material category.

Figure 5.7
Organics Recycling 1989-2003



Scrap Metal

Scrap metal recovery in Washington, including ferrous, nonferrous, white goods, and aluminum and tin cans, increased significantly from its 22% of recycled materials share in 2002, to 30% in the year 2003. (See Figure 5.4.) Reported tons collected in all categories of scrap metal increased in 2003, with ferrous and nonferrous metals collection increasing dramatically by 64% and 87% respectively. (See Figure 5.8 and 5.9.) Reported tons of aluminum cans grew by 38%, tin cans by 1%, and white goods by 22%.

Figure 5.8
Aluminum and Tin Cans Recycled 1986 to 2003

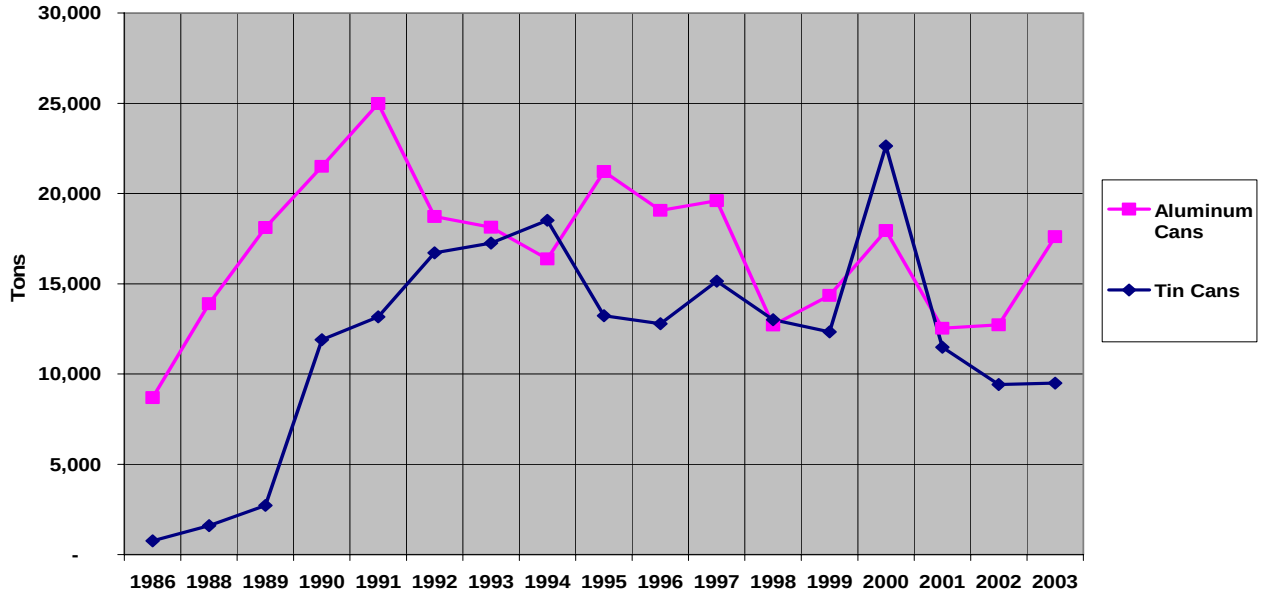
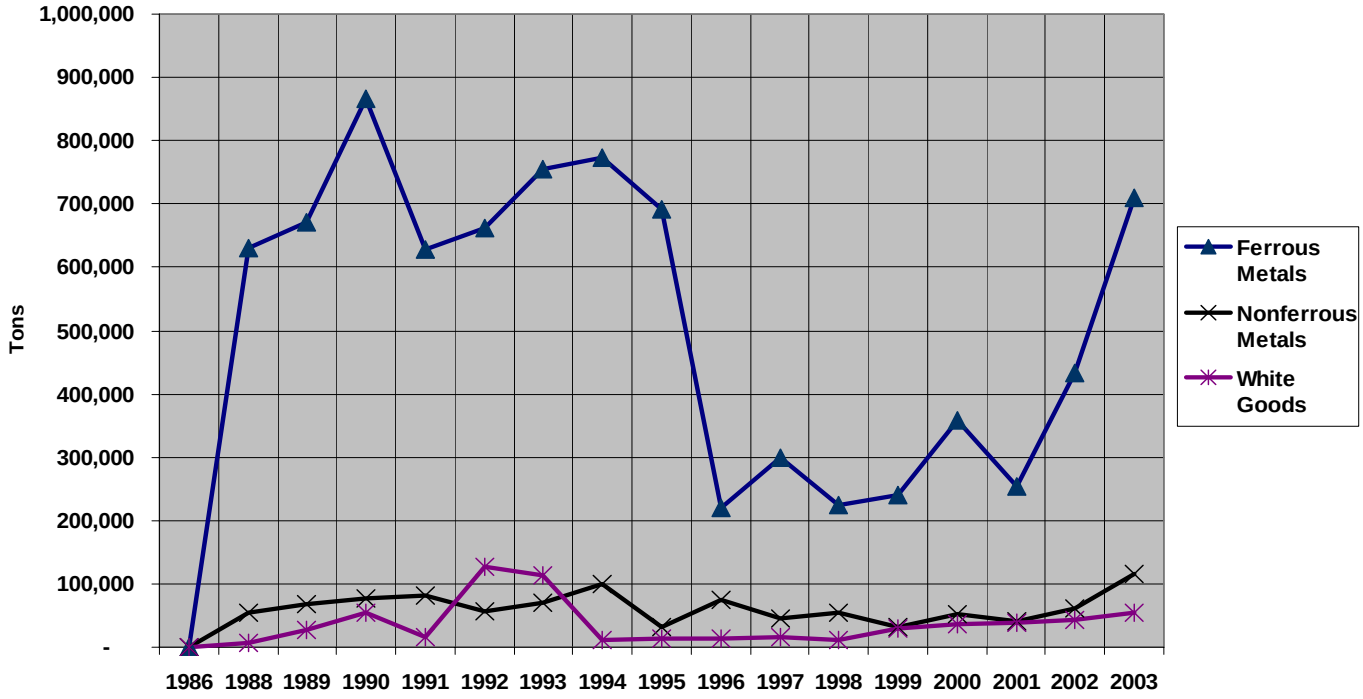


Figure 5.9
Ferrous, Nonferrous Metals and White Goods Recycled 1986 to 2003

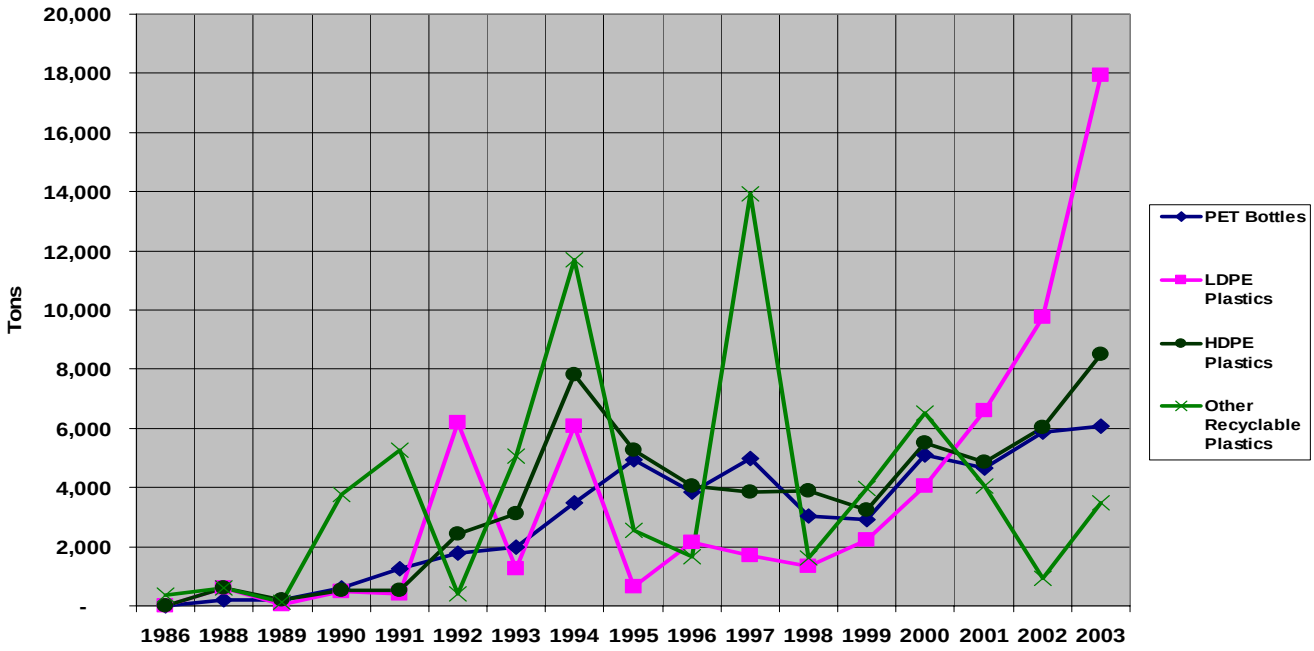


Metals had seen a low trend in reporting in the years since 1996, the year that the Asian markets also fell considerably and the atmosphere among metals recyclers became more guarded and competitive. In response to this, in 2002 and 2003, Ecology worked more closely with metals recycling firms to gain confidence in an attempt to increase reporting. This effort, combined with the shift in reporting requirements for permit-exempt facilities, has served to boost the reporting in the scrap metals sector.

Plastics, Glass and Other Recycled Materials

The total of all plastics categories (HDPE, LDPE, PET and Other Recyclable Plastics) showed a 59% gain over last year. Although all categories of recovered plastics showed a gain over 2002, LDPE or film plastics showed by far the greatest gain of 83%. (See Figure 5.10.) Reported tons of LDPE have been steadily increasing since 1998, when it had the lowest reported tons of all the recovered plastics. LDPE recovery has had the highest reported tons of all the plastics from 2001 through 2003. It is the only recycled material from the MSW stream that has shown consistent upward growth in reported tons since 1998.

Figure 5.10
Plastics Recycling 1986 to 2003

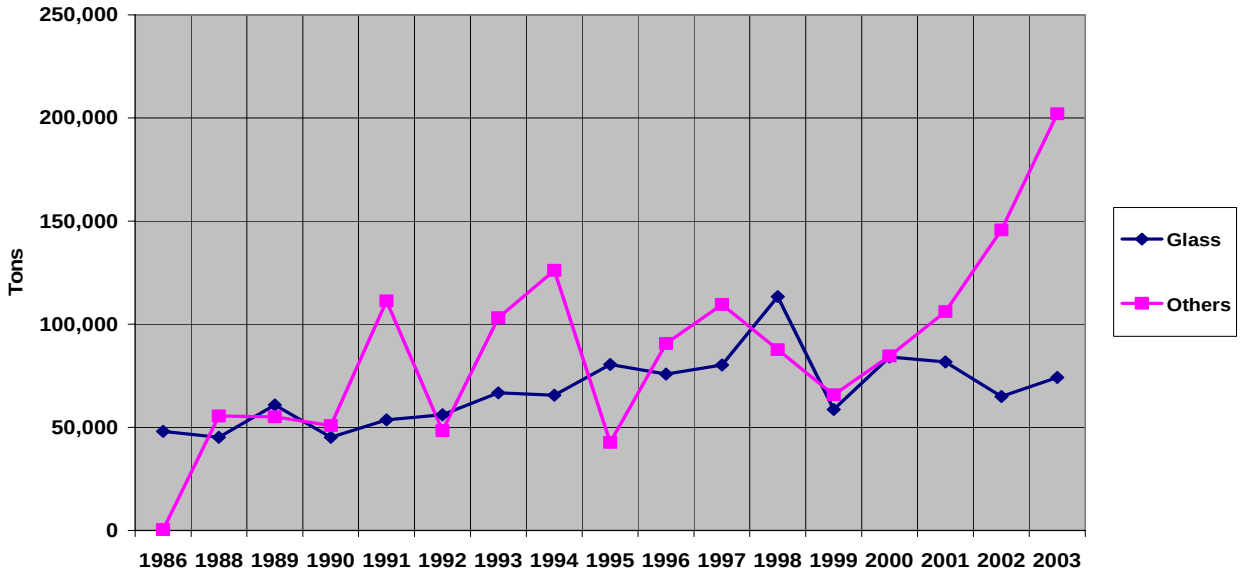


Reported tons of container glass increased by 14% in 2003. The recovered glass category constitutes only 2.5% of the total recyclable materials stream. (See Figure 5.4.) Despite this increase in the collected tonnage, the markets for recovered glass continue to be low. (See Figure 5.11.)

The use of refillable bottles, as tracked by the recycling survey, has shown zero since 2000. This option of using refillable bottles (the majority of the volume in past years has been in beer bottling) has become too costly for business owners, and refillable bottles have gone out of use almost completely. The exception to their complete demise is that some dairies are continuing to use refillable milk bottles, as a response to customer demands and in spite of them being more costly to use.

The "other" recycled materials category consists of materials that do not fit into the categories of paper, organics, metals, glass or plastics. It includes milk cartons/drink boxes-Tetra (MC/DB-Tetra), computers and parts, fluorescent light bulbs, gypsum, other rubber materials, photographic films, textiles, recycled tires, used oil, and vehicle batteries. The tonnage increased greatly for the category as a whole. (See Figure 5.11.) "Other rubber materials" was the only category to have a decrease in reported tons of material. MC/DB-Tetra has been added in recent years to several curbside collection programs, including the City of Seattle. The commercial collection of computers and parts (including some other electronics) is a rapidly growing industry in the urban areas. The industry will likely continue to grow as we see an increase in the awareness of how these products are disposed of and as the length of their useful life decreases due to changes in technology. Scrap tire recovery, including recycling and diversion, is treated in greater detail in the next section of this chapter.

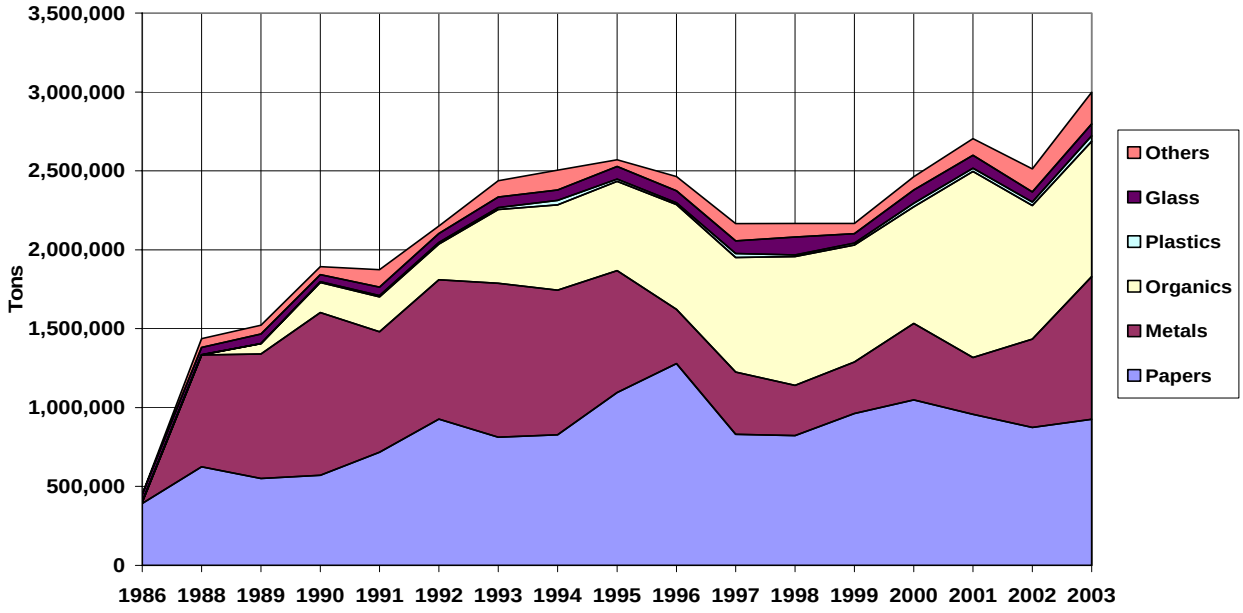
Figure 5.11
Glass and Other Materials Recycled[35] 1986 to 2003



[35] Other materials includes MSW recyclables, such as computers, fluorescent light bulbs, gypsum (also included with construction & demolition analysis), rubber materials, textiles, used oil, recycled tires (excludes tires retreaded or burned for energy), photographic films, vehicle batteries and milk cartons/drink boxes.

Figure 5.12 shows the relationship of the six major recycling categories discussed above from 1986-2002.

Figure 5.12
Six Major Recycling Categories[36] 1986 to 2003



Diverted Materials and Markets[37]

The diversion rate in Washington for 2003 is 47%, a 2% increase over 2002. Since the diversion rate calculation includes materials measured as part of the MSW recycling rate as well as those not part of MSW recycling, much of the increase in the diversion rate can be attributed to the increase in the recycling rate. For a separate analysis of materials which are included in the recycling rate, refer to the previous section of this chapter. Apart from the MSW recycling tonnage, the amount of diverted materials collected increased by only about 60,000 tons from 2002 to 2003. (See Table 5.3.)

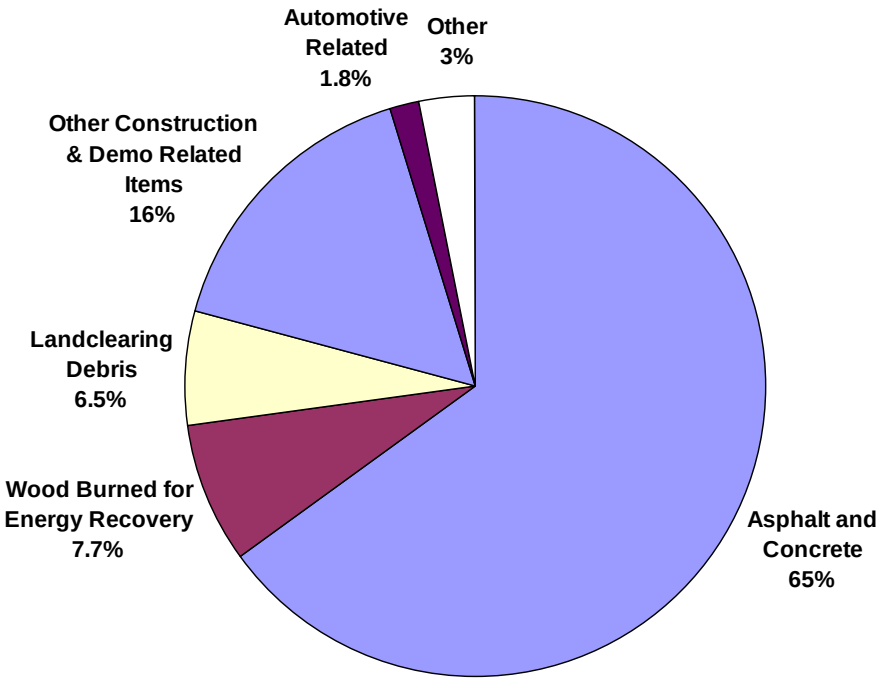
The diverted materials stream, which for this analysis excludes recycled materials, is separated into six general categories in Figure 5.13. Asphalt and concrete make up the greatest portion of the diverted materials pie at 65%. Second, other construction and demolition items make up 16% of the total diverted. Wood burned for energy recovery comes in third with 7.7% of the diverted materials stream. Landclearing debris accounts for 6.5% of the diverted materials reported. Automotive related materials, such as antifreeze, oil filters, and used oil burned for energy recovery, make up 1.8% of the total, and the other categories make up 3% of the diverted materials collected.

[36] MSW recycling only, excluding diverted materials.
[37] The detail in this section refers to diverted materials only, excluding recycled materials.

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. These materials represent over 80% of the diverted materials reported.

Figure 5.13
Diverted Materials[38] – 2003



Scrap Tire Generation, 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. The following information is a summary report of the annual legislative tire report for 2003.

[38] Excludes materials that are included in calculation of the recycling rate.

Methodology for Determining Used Tire Recycling Rates

The estimates of generation, reuse, recycling, energy recovery, and disposal of used tires in Washington State were developed using a combination of the Ecology annual disposal reports, recycling reports, recycling survey, estimation models, and published information.

Two models were used to estimate used tire generation in Washington. One model was based on vehicle registration. Some assumptions were incorporated into this model about the useful life of the average tire, the weight of passenger car and truck tires, and the use of recapped tires. The other model to estimate used tire generation was based on population and average tires generated per person.

Recycling, recapping, and energy recovery of tires was determined through a combination of data from Ecology's 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 was obtained through annual reports from landfills, the recycling survey, and a telephone survey of tire handlers.

Tire Generation, Recycling and Disposal Rates

Based on the average of the estimation models, approximately 4.9 million used tires were generated in Washington State in 2003, including tires from all registered vehicles. Of the estimated total of 4,934,495 tires generated in 2003, Ecology has information on the end use of 87%, or 4,271,715 tires. Of the 4,271,715 tires reported to Ecology for 2003, 18% were recapped or retreaded, 38% were recycled, and 13% were used as tire-derived fuel or burned for energy. (See Table 5.4.) The remaining 31% reported were disposed of in permitted landfills.

Table 5.4
Used Tires in Washington State
Breakdown of Uses and Generation (2003)

Use Type	Tons of Used Tires[39]	Number of Used Tires[40]	Percent
Recapping	12,976	763,307	15%
Recycled	27,753	1,632,523	33%
Tire-Derived Fuel	9,664	568,449	12%
Landfill Disposal	22,226	1,307,435	27%
Unknown Uses[41]	11,267	662,780	13%
Total Tires Generated[29]	**83,886**	**4,934,495**	**100%**

[39] Assumes 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.
[40] Assumes 40% of trucks use new tires and 60% of trucks use recapped tires.
[41] The estimation model based on population estimates 19,785 more tons of tires, or 1,163,805 more tires, generated in 2003. Unknown uses of tires in the population model add up to 31,052 tons or 1,826,585 tires.

Generation of Used Tires

Two models were considered to estimate the generation of used tires: first, the model based on vehicle registration, and second, the model based on population.

The estimation model based on vehicle registration assumed a tire lasts about four years, and therefore each passenger car and light truck would generate one used tire per year. This model also assumed that 40% of heavy trucks would generate one tire per year, and the remaining trucks would use recapped tires. Based on these assumptions, the vehicle registration model estimated that approximately 4,934,495 used tires were generated in 2003.

Table 5.5 shows that passenger tires account for approximately 80% of all used tires. The model assumed that each passenger car generates one used tire per year. "Other Vehicles," including mopeds, motorcycles, and off-road vehicles, are assumed to generate 0.5 used tires per year. Gasoline-fueled trucks, diesel-fueled trucks, trailers, and miscellaneous vehicles are assumed to generate 0.4 tires in this model.

Table 5.5
Estimated Generation of Used Tires by Vehicles Type[42] (2003)

Vehicle Type	Number of Tires Generated	Percent of Tires
Passenger Car	3,948,312	80%
Other Vehicles	118,067	2%
Trucks	474,495	10%
Trailers	224,834	5%
Miscellaneous Vehicles	168,787	3%
Total	**4,934,495**	**100%**

The estimation model based on population is used as a check for the vehicle registration model. The population model assumes that tires are generated at the rate of 1 tire per person per year.[43] The results of this model indicated that there were 6,098,300 tires generated in 2003; approximately 1,163,805 more tires than were estimated by the vehicle registration model. The average of these two estimation models indicates that the generation of used tires in Washington State in 2003 was about 5.5 million tires.

Recapping (Reuse) of Used Tires

According to the Tire Retread Information Bureau, there are 25 tire retreaders in Washington State. In addition, one of the country's largest retreaders, Les Schwab in Oregon, accepts used tires for recapping from Washington State. Although retreaders in Washington generally rely on material from inside the state, Les Schwab, in Prineville,

[42] Based on vehicle registration estimation model.

[43] U.S. Scrap Tire Markets, 2003, Rubber Manufacturers Association.

Oregon, accepts truck and passenger tires from the entire West Coast. For reasons of confidentiality, the number of tires recapped by individual firms is not reported.

There were approximately 763,307 used tires reported as recapped that were generated in Washington State in 2003.

Recycling of Used Tires

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, some of the tires reported to Ecology on the annual recycling survey are not necessarily being recycled in this manner. Rather, the tires reported are what the reporting entity *collects*, and are actually destined for all of the different tire markets, including recapping, recycling, tire-derived fuel, and disposal. Primary collectors simply may not know the eventual use of the collected tires that are hauled to supposed "recyclers." Also, not all handlers responded, which could influence the annual recycling survey results.

A separate telephone survey of the firms reporting "recycling" to Ecology reveals that about 38% of their total collection is eventually recycled. There were approximately 1,632,523 used tires reported as recycled in Washington for 2003.

Energy Recovery/Tire-Derived Fuel

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 568,449 used tires reported to have been burned for fuel in 2003.

Disposal of Used Tires

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 22,226 tons in 2003, or about 1,307,435 tires. Also, 18,849 tons, or 1,108,706 tires, are estimated to have been disposed of inadvertently at MSW landfills as part of the residential and commercial waste stream.[44] This is to say that an estimated 41,075 tons or 2,416,176 of Washington's tires were disposed of at landfills in 2003.

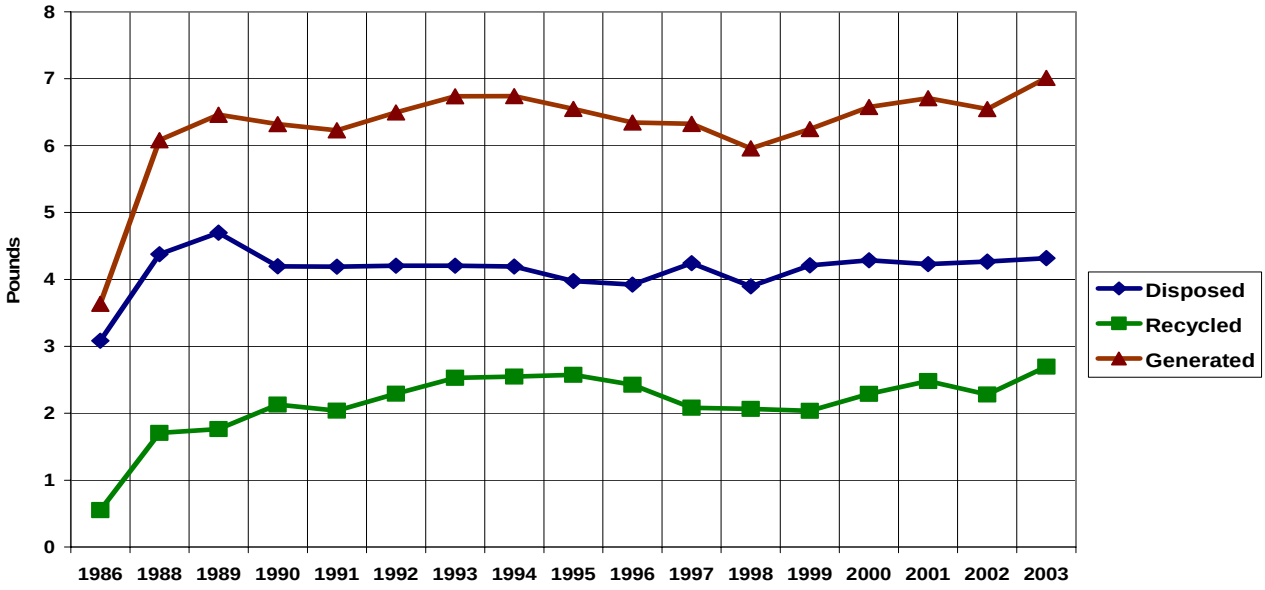
Individual Waste Generation (MSW)

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

[44] Based on the "Waste Composition Analysis for the State of Washington," June 2003.

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 tangible for some when described in individual or "per person" terms. Figure 5.14 illustrates an average of how each person in the state contributes to the **municipal solid waste stream**. (See Chapter VI for a discussion of how each person contributes to overall waste generation.) In 2003, each resident of the state generated 7.01 pounds of municipal solid waste per day, an all-time high for Washington; 4.32 pounds were disposed of and 2.69 pounds were recovered for recycling. (See Table 5.7.)

Figure 5.14
Pounds MSW Disposed, Recycled, and Generated Per Person/Day
1986-2003



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, these numbers provide a check for the state's recycling numbers.

Table 5.7
Pounds MSW Disposed, Recycled and Generated Per Person/Day
1993-2003

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

Chapter VI
Disposal of Solid Waste in Washington

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.

Landfilling is the basic method of final disposal and includes five types of landfills - municipal solid waste landfills, woodwaste landfills, limited purpose landfills, inert/demolition landfills and ash monofills.

As part of the annual reporting requirements of chapter 173-304 WAC, *the Minimum Functional Standards (MFS)* and chapter 173-351, *Criteria for Municipal Solid Waste Landfills*, forms were sent to the various types of landfills for them to report the types and quantities of waste they received for disposal. The categories of solid waste specified on the form were municipal, demolition, industrial, inert, commercial, woodwaste, sewage sludge, asbestos, petroleum contaminated soils, tires, special waste and other. The facilities were also asked to report the source of their waste: out-of-county, out-of-state or 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.

Municipal Solid Waste Landfills

Amount of Waste Disposed in Municipal Solid Waste Landfills

In 2003, 19 municipal solid waste landfills accepted waste totaling 4,572,275 tons.[45] Of the 19 landfills, 14 were publicly owned, and five were privately owned.

Five of the 19 landfills received over 100,000 tons of waste in 2003. 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 979,978 tons, 776,186 and 1,923,230 tons, respectively. In 2003, three landfills received less than 10,000 tons, compared with 12 MSW landfills in 1994. Of those, one is in the City of Tacoma and

45 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.

used for emergency only in the future, one is located at Fort Lewis in Pierce County and the other is in Grant County. This trend (Figure 6.1) 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 6.1
MSW Landfill Size
(Number of Landfills Based on Disposed Tons Per Year)

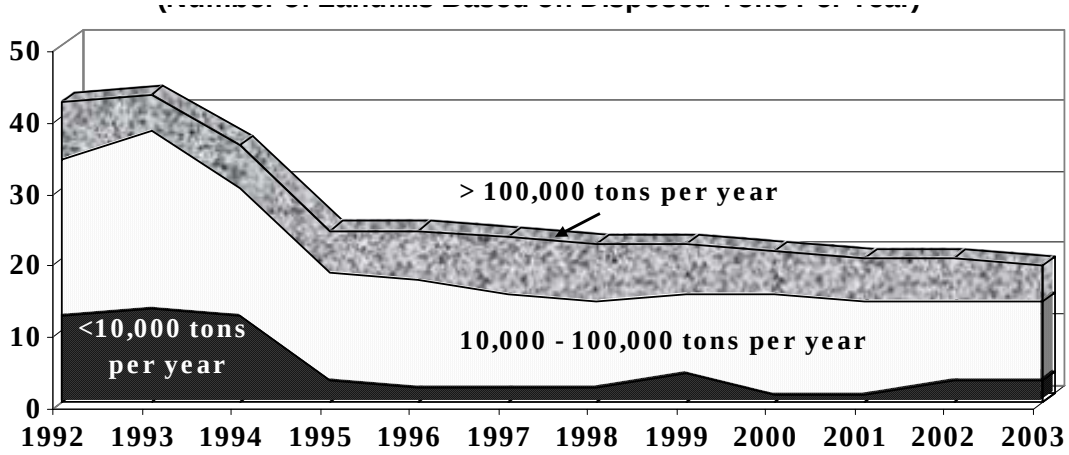


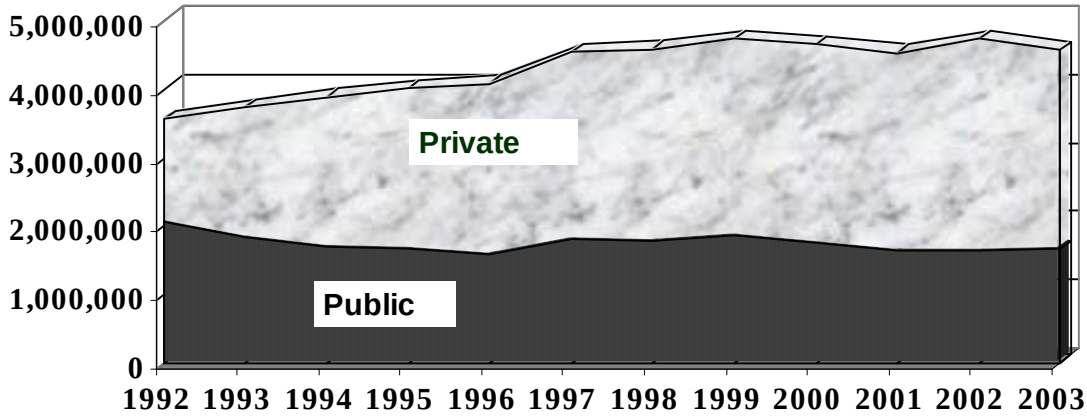
Table 6.1 shows the relationship of waste disposed to public/private ownership. As the table illustrates, 1,664,816 tons of solid waste disposed went to publicly owned facilities (36%), with the remaining 2,907,459 tons going to private facilities (64%).

Table 6.1
Waste Disposed in MSW Landfills – Public/Private

OWNERSHIP	NUMBER OF MSW LANDFILLS		AMOUNT OF WASTE DISPOSED (Tons)		% TOTAL WASTE DISPOSED	
	1991	2003	1991	2003	1991	2003
PUBLIC	36	14	2,696,885	1,664,816	69	36
PRIVATE	9	5	1,192,207	2,907,459	31	64
TOTAL	45	19	3,889,092	4,572,275	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 6.2). 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 64% in 2003. The majority of this increased amount can be accounted for by the private Roosevelt Regional Landfill in Klickitat County and LRI-304th Street in Pierce County.

Figure 6.2
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.[46] 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. Eleven of the 19 landfills reported a significant amount of solid waste disposed, other than municipal solid waste. Demolition, industrial, inert, commercial, woodwaste, sludge, asbestos, petroleum contaminated soils (PCS) and tires were the major waste streams. (A few landfills report all types of waste under the general "municipal" category so exact amounts cannot be determined.) Table 6.2 shows changes in waste, types and amounts disposed in MSW landfills from 1996 through 2003. (See Appendix B, Table B.1 for specific 2003 MSW facility data. For MSW landfill data from 1992-2003 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

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

Table 6.2
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)
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
Demolition Waste	375,412	385,412	446,172	437,005	569,239	373,254	379,405	324,069
Industrial Waste	145,617	163,431	159,781	232,905	88,841	201,198	179,058	212,918
Inert Waste	30,061	117,512	107,452	23,875	19,349	26,376	17,092	2,635
Commercial Waste	109,093	173,863	158,256	129,070	93,752	66,391	99,048	93,036
Woodwaste	57,667	57,128	60,383	68,889	47,087	34,254	55,149	47,622
Sewage Sludge	49,205	72,741	67,419	62,920	47,783	1,473	1,762	23,435
Asbestos	7,965	9,558	10,684	9,666	7,922	5,991	4,908	9,625
Petroleum Contaminated Soils	254,414	444,260	288,407	312,247	231,290	217,721	457,061	342,172
Tires	12,787	14,912	19,130	12,581	43,188	8,567	5,776	9,512
Special	10	6	904	0	437	917	567	0
Medical	na	Na	na	na	239	387	372	2,459
Other**	233,526	10,809	40,880	28,235	173,711	156,131	103,636	110,364
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

* 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.

In reviewing the types of waste that were disposed in the MSW landfills in 2003, increased amounts were reported for the categories of industrial sewage sludge, asbestos, tires, medical and other. All other categories showed a decrease. The overall total disposed decreased.

Waste-to-Energy/Incineration

Three waste-to-energy facilities/incinerators statewide burned 303,978 tons of solid waste. Of that amount, 10,035 tons were identified as woodwaste at the Inland Empire Paper facility in Spokane and 28,958 tons of waste at the Ponderay Newsprint Company in Pend Oreille County. These two incinerators do not burn municipal solid waste. In 2003, only 6% of solid waste was incinerated statewide. The highest percent of waste incinerated in the state was 12% in 1995. (See Appendix B, Table B.2 for facility specific 2003 energy recovery/incinerator data.)

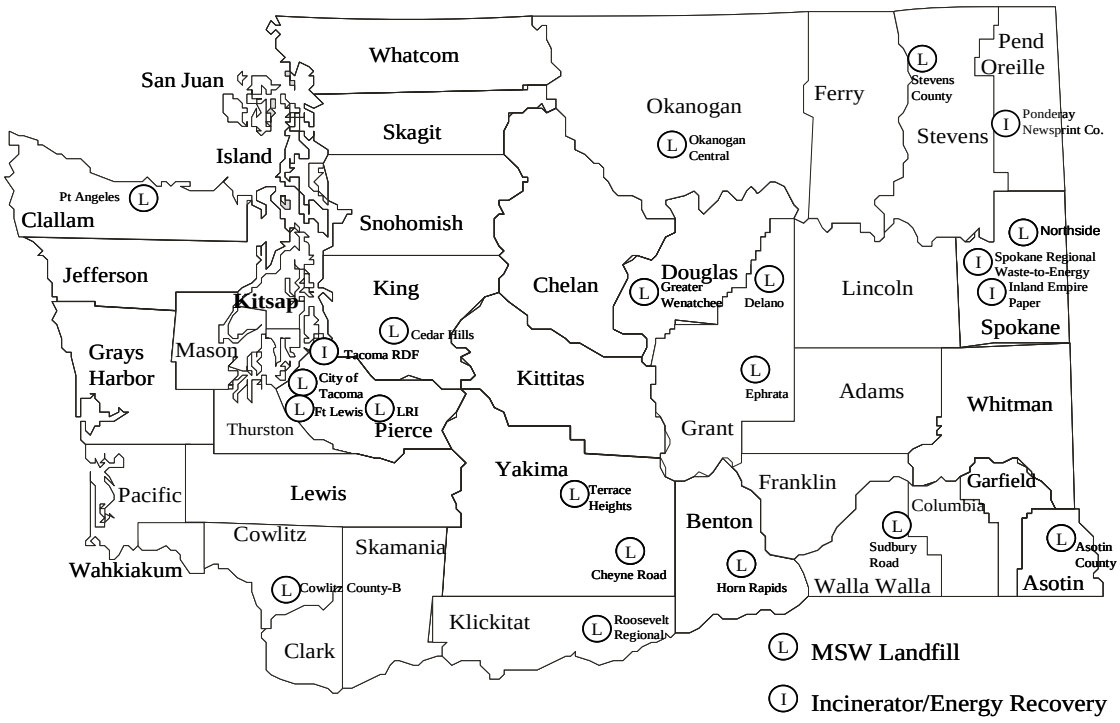
Ash Monofill

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 2003, there was one energy recovery/ incinerator that met this criteria. The municipal solid waste incinerator ash (76,262 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 2004)



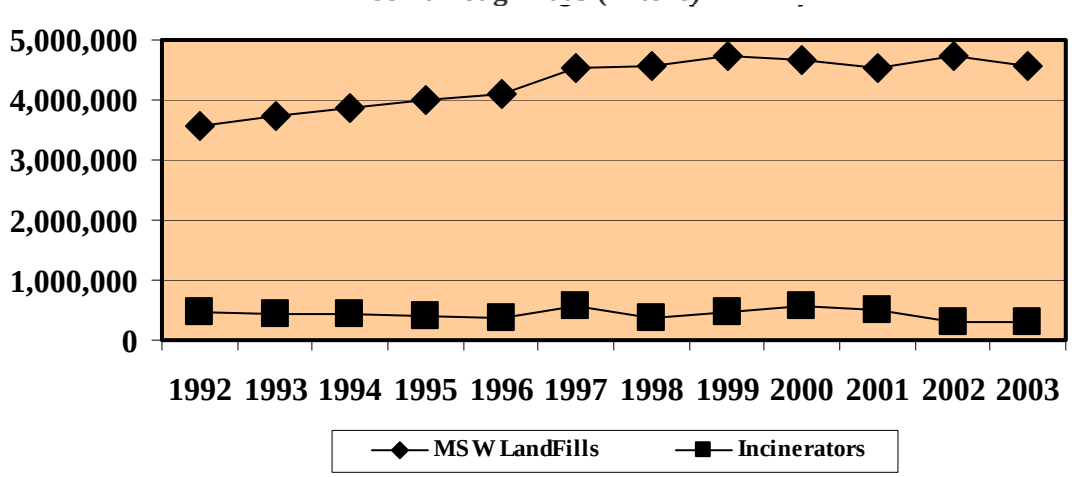
A comparison of the amount of solid waste disposed in municipal solid waste landfills and waste-to-energy facilities and incinerators in 2003 is shown in Table 6.3.

Table 6.3
Waste Disposed in MSW Landfills and Incinerators in 2003

FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	4,572,275	94%
Incinerators	303,978	6%
TOTAL	4,876,253	100%

The largest change in disposal methods over the past few years has been between landfilling and energy recovery/incineration. 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 2003 there was 6% of the waste stream incinerated. The rate has varied between 6 and 11% since 1998. (See Figure 6.3)

Figure 6.3
Comparison of Solid Waste Landfilled & Incinerated
1991 through 2003 (in tons)



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/Demolition, Limited Purpose and Woodwaste Landfills

In addition to municipal solid waste landfills, there are currently three other types of landfill types in the state: inert/demolition, limited purpose, and woodwaste. These were regulated under chapter 173-304 WAC, the *Minimum Functional Standards for Solid Waste Handling (MFS)*. With the completion of chapter 173-350 WAC, *Solid Waste Handling Standards* in February 2003, the classification and requirements for these types of landfills have changed. There are no longer be woodwaste landfill or inert/demolition landfill categories. Inert waste will be 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 will be permitted as limited purpose landfills. The limited purpose landfill category remains with increased design and monitoring requirements.

For 2003, annual report forms were received from the inert/demolition, limited purpose and woodwaste landfills. Tables 6.4 - 6.6 identify the types and quantities of waste received at these landfills.

Table 6.4 includes the waste types and amounts reported by 27 inert/demolition landfills for 2003. Based on materials reported disposed, only 15 of those landfills could be

classified as inert landfills under the new regulation. There was a decrease in industrial waste, but an overall increase in other types of waste. Some facilities may be over-reporting disposal numbers since much of the material coming on-site is being recycled, for example as aggregate. SW&FAP will be gathering additional information in the future to better distinguish disposal versus recycling tonnages at some of these facilities. (See Appendix B, Table B.3 for 2003 facility specific inert/demolition landfill data. For inert/demolition landfill data from 1992-2003 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

Table 6.4
Waste Types and Amount Disposed at Inert/Demolition Landfills (in tons)

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

Table 6.5 includes the types and amounts of waste reported disposed at 10 limited purpose landfills for 2003. There were increases in demolition and asbestos. All other waste types and the overall total were less. (See Appendix B, Table B.4 for 2003 facility specific limited purpose landfill information data. For limited purpose landfill data from 1992-2003 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

Table 6.5
Waste Types and Amount Disposed at Limited Purpose Landfills (in tons)

WASTE TYPES	1997	1998	1999	2000	2001	2002	2003
Municipal	0	0	0	0	0	0	0
Demolition	85,916	98,072	84,140	71,203	71,817	98,827	68,946
Industrial	277,419	225,779	262,021	278,224	325,114	282,747	325,863
Inert	109,174	112,714	136,352	205,902	202,577	195,303	157,431
Commercial	0	0	0	0	0	0	0
Wood	14,589	7,700	8,853	3,205	6,841	2,747	8,420
Sludge	2,275	0	1,103	0	0	0	0
Asbestos	1,310	1,058	1,549	1,654	1,282	1,311	1,302
PCS	121,066	56,407	8,837	7,159	13,222	9,888	4,890
Tires	434	559	59	25	41	59	81
Other	83,600	124,607	66,833	79,291	24,698	14,402	19,737
TOTAL (tons)	695,783	628,896	569,747	646,662	645,592	605,284	586,670

Table 6.6 includes the waste types and amounts reported at one woodwaste landfill for 2003. Most woodwaste landfills have closed. A high demand for wood products has increased the reuse and recycling of woodwastes that had been disposed in the past. Some woodwaste landfills are actually "mining" materials disposed in the past. These operations will be evaluated further to determine how to more accurately determine the amount of material disposed. With only one woodwaste landfill still operating, there was a decrease all categories. (See Appendix B, Table B.5 for 2003 facility specific woodwaste landfill data. For woodwaste landfill data from 1992-2003 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

Table 6.6
Waste Types and Amount Disposed at Woodwaste Landfills (in tons)

WASTE TYPES	1997	1998	1999	2000	2001	2002	2003
Municipal	0	0	0	0	0	0	0
Demolition	17,718	21,313	25,121	32,182	31,559	21,275	23,995
Industrial	0	0	0	15,120	0	0	0
Inert	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Wood	69,498	36,777	75,668	33,452	21,739	11,896	10,693
Sludge	0	0	0	0	0	0	0
Asbestos	0	0	0	0	0	0	0
PCS	0	0	0	0	0	0	0
Tires	0	0	0	0	0	0	0
Other	8,109	1,320	1,695	622	0	0	0
TOTAL (tons)	95,325	59,410	102,484	87,552	53,298	33,171	34,188

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 19 active MSW landfills reported receiving over 2 million tons of solid waste from other counties in 2003.

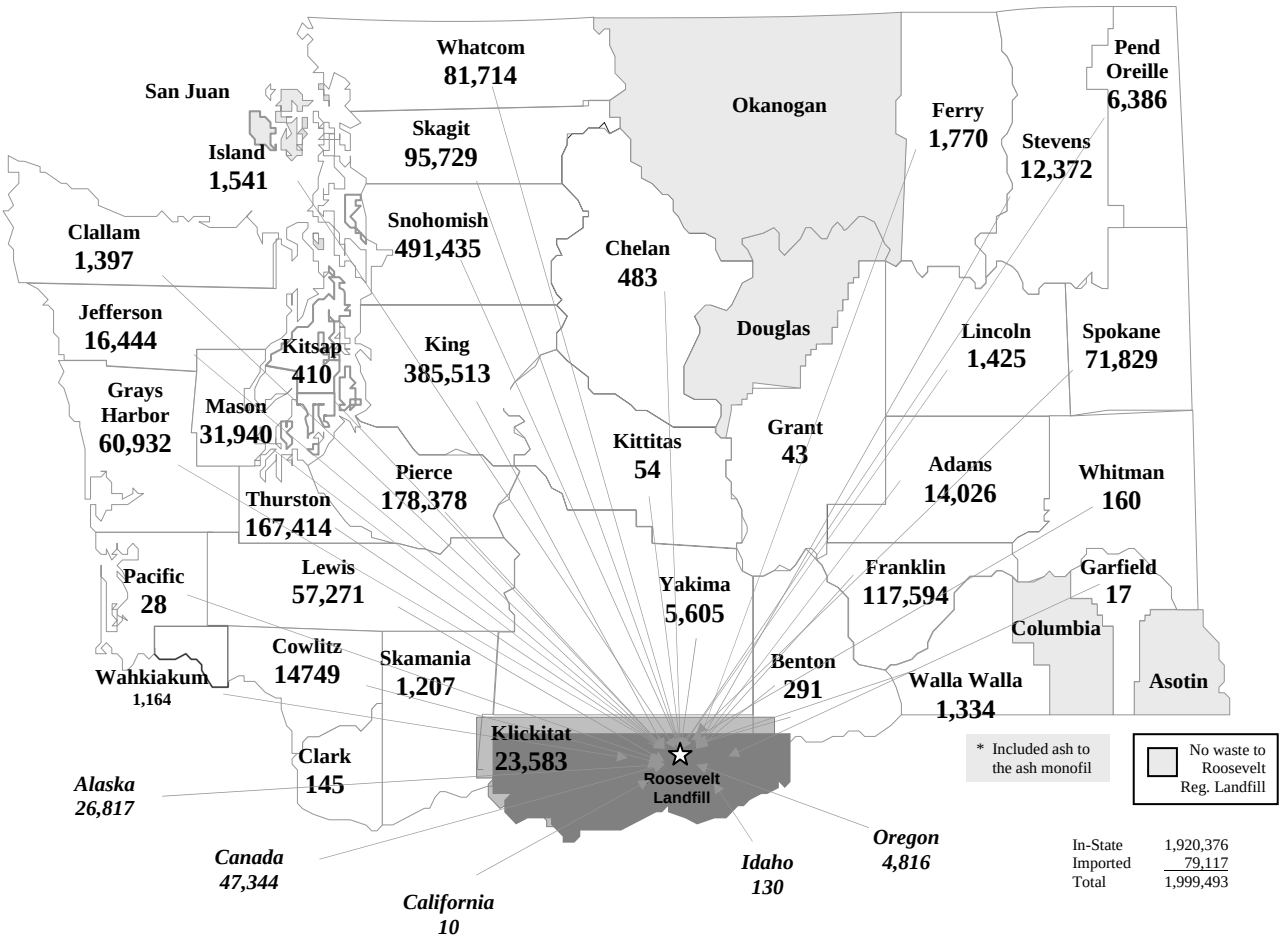
Some of the municipal solid waste movement was because of closer proximity to a neighboring county's landfill, especially for the smaller landfills which received municipal waste from other counties without there own landfills. Some of the waste disposed from other counties was non-municipal waste such as PCS, demolition and asbestos.

With the closure of many local landfills, Roosevelt Regional Landfill in Klickitat County, and to a lesser extent, Oregon's regional landfills, have become the chosen disposal option. The Roosevelt Regional Landfill received some type of solid waste from 34 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. Thirteen of the 34 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. Three other counties send a significant amount of waste to Oregon.

In addition to waste movement to MSW landfills, the Spokane Regional Waste-to-Energy Facility received 57 tons of MSW waste from beyond its home county. Two inert/demolition landfills received 3,747 tons of demolition waste and two limited purpose landfills received 243,454 tons of waste (industrial, asbestos, inert, demolition and PCS) from other counties. One woodwaste landfill received 2,800 tons of demolition waste from another county.

Spreadsheets which identifies the disposal location, type and amount of waste for each county for 2003 and previous years information can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Map B: 2003 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 2003, a total of 122,884 tons of solid waste, about 2.5% 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 6.7. The majority of this waste (79,117 tons) went to Roosevelt Regional Landfill. Of that 47,343 tons were imported from British Columbia, with the remainder from Alaska, Oregon, Idaho and California.

Table 6.7
Out-of-State Waste Disposed in Washington

TYPE OF WASTE	QUANTITY (TONS)			
	1991	2001	2002	2003
Municipal Solid Waste	24,475	100,092	112,097	77,803
Demolition	1,412	4,370	6,104	3,824
Industrial	0	57,952	42,953	30,584
Inert	0	0	1,097	0
Woodwaste	208	2	35	28
Sludge	36	0	0	621
Asbestos	0	243	350	1,245
Petroleum Contaminated Soils	0	4,910	1,769	3,114
Tires	0	1,622	1.162	5,157
Medical	na	0	0	0
Other	0	33	359	508
TOTAL	26,131	172,696	165,935	122,884

Nez Perce County, Idaho, disposed of approximately 25,000 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 only 9 tons of MSW from Idaho. Three limited purpose landfills imported a total of 17,059 tons of waste from Oregon, Idaho and Montana. The Weyerhaeuser limited purpose landfill in Cowlitz County received most of this waste (15,673 tons). One inert/demolition landfill received 352 tons of inert/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 2003, a total of 1,515,532 tons of waste generated in Washington was disposed in Oregon landfills, an increase from 705,608 tons in 1992. Table 6.8 compares the waste amounts and types exported and imported. (See http://www.ecy.wa.gov/programs/swfa/solidwastedata/ for imported totals for 1991-2003 and for exported totals 1993-2003.)

Table 6.8
Comparison of Imported-to-Exported Waste for all Solid Waste Facilities

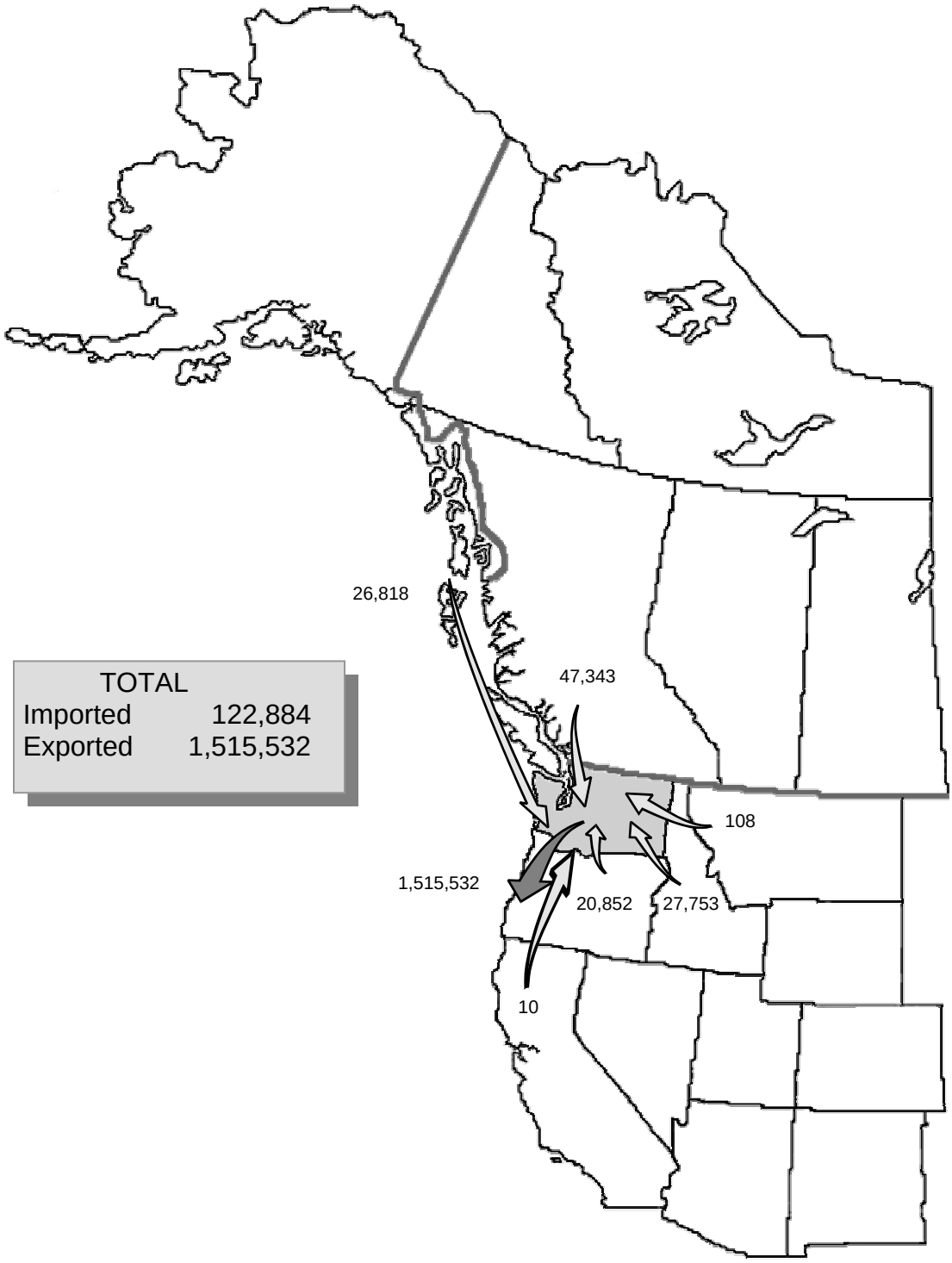
TYPE OF WASTE	IMPORTED		EXPORTED	
	2002	2003	2002	2003
Municipal Solid Waste	112,097	77,803	1,001,717	1,119,615
Demolition	6,104	3,824	99,501	142,781
Industrial	42,953	30,584	111,284	92,449
Inert	1,097	0	38	157
Woodwaste	35	28	0	1,145
Sludge	0	621	0	22
Asbestos	350	1,245	5,379	5,764
Petroleum Contaminated Soils	1,769	3,114	199,846	93,030
Tires	1,162	5,157	0	16
Medical Waste	0	0	2,045	39
Other	359	508	5,438	60,512
TOTAL	165,935	122,884	1,425,248	1,515,532

Major exporters of municipal solid waste in Washington included the City of Seattle (456,124 tons of MSW), Clark County, Island County, Pacific County, San Juan County, Skamania County, Whitman County, and a portion of Benton 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

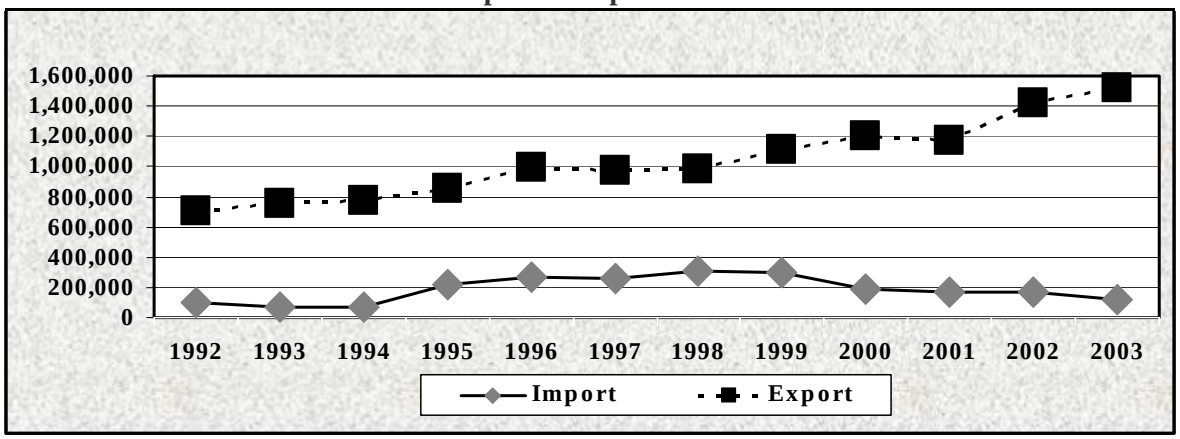
The first significant movement of waste across Washington State boundaries started in 1991. In mid-1991, the City of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington, accepting waste from British Columbia, Idaho, and Oregon. Map C identifies the sources and amounts of waste that were imported and exported in 2003.

Map C: Imported and Exported Waste (2003)



As can be seen in Figure 6.4, 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 122,884 tons in 2003. Exported waste amounts increased in 2003, with almost twelve 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 6.4
Trend of Imported/Exported Solid Waste



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/demolition landfills, limited purposed landfills, woodwaste landfills and energy recovery/incinerators.

Total Waste Disposed in Washington State

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

To gain a more 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, 5,973,325 tons of waste were disposed of in all types of landfills and incinerators in Washington in 2003 (see Table 6.9). (See http://www.ecy.wa.gov/programs/swfa/solidwastedata/ for total solid waste disposed from 1993-2003.)

Table 6.9
Total Amounts of Solid Waste Disposed in Washington

DISPOSAL METHOD	1997	1998	1999	2000	2001	2002	2003
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
Incinerated Waste	551,006	369,778	461,684	554,780	496,152	311,474	303,978
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
Limited Purpose Landfills	695,783	628,896	569,747	646,662	645,592	605,284	586,670
TOTAL	6,475,181	6,134,719	6,408,878	6,425,959	6,453,904	6,171,407	5,973,325

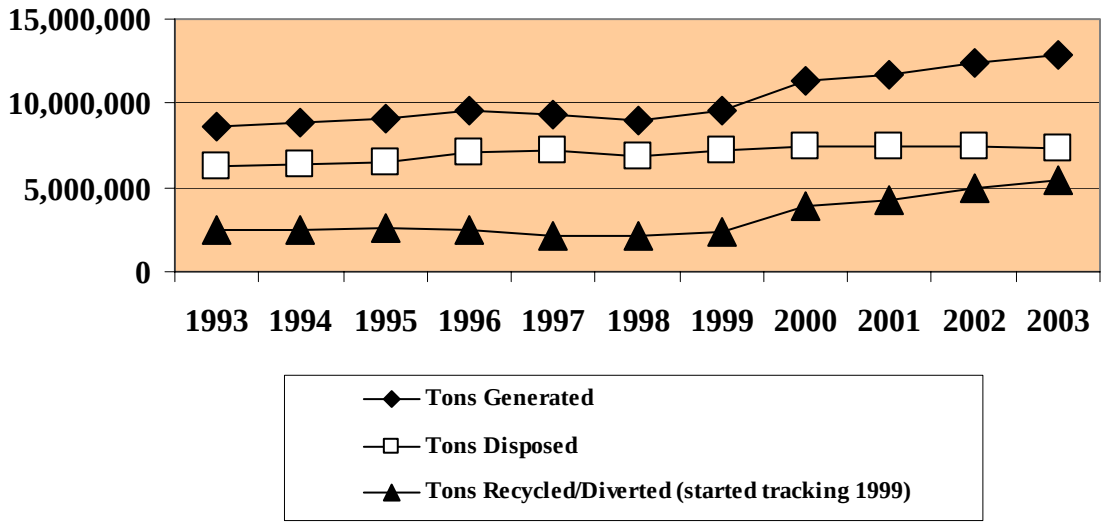
Waste Generated by Washington Citizens

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[47]). 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 6.5 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. 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 materials recycled (see Chapter V for a more detailed discussion). While the disposal rates have leveled off somewhat, the recycling and diversion amounts have increase resulting in an increase in the amount of waste generated.

[47] 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.

Figure 6.5
Washington State Trends in Solid Waste
Generated Recycled/Diverted & Disposed (in tons)



Washington State's population has continued to grow since disposal numbers were tracked in 1991 (see Table 6.10). The increased population has had a correlated increase in waste generated. The amounts of wastes disposed has shown a slight decrease in the last two years (from a high of 1.29 tons/person/year in 2000 to 1.21 tons/person/year in 2003). However the recycling/diversion rates has increased over that time from 0.41 tons/person/year in 1999 to 0.90 tons/person/year. While this may indicate less material reaching the landfills, it still shows an increase in the overall amount of waste generated.

Table 6.10
Washington State 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

Figure 6.6 analyzes 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 6.11 shows the per capita numbers (pounds/person/day) from 1995 through 2003.

Figure 6.6
Washington State Trends in Solid Waste
Generated, Recycled & Disposed (tons/person/year)

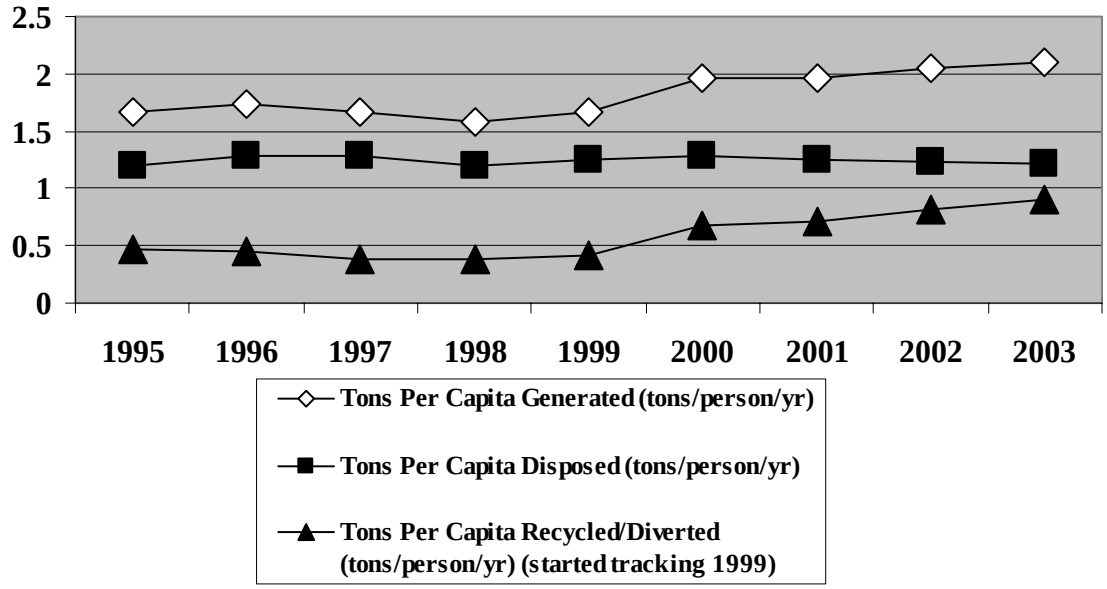


Table 6.11
Per Capita Disposed, Recycled/Diverted and Generated Numbers
(pounds/person/day)

Per Capita	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Disposed[48]	6.49	6.51	6.56	7.00	7.00	6.57	6.87	7.06	6.84	6.74	6.62
Recycled	2.58	2.56	2.56	2.51	2.10	2.05	2.25	3.69	3.91	4.46	4.91
Generated	9.08	9.07	9.12	9.51	9.10	8.61	9.12	10.75	10.75	11.20	11.52

While the overall total of waste has decreased, the municipal solid waste as well as the industrial portions of the waste stream have increased. Traditional recycling commodities (aluminum cans, glass and corrugated paper, etc.) have increased as well as the recycling and diversion of construction/demolition waste. There was a corresponding decrease in construction and demolition materials reported disposed at the various landfill types. The revised state solid waste plan, Beyond Waste, completed in November 2004,

[48] Disposed amounts include all waste generated from Washington disposed in MSW, limited purpose, woodwaste and inert/demolition landfills and incinerators, both instate and exported.

provides the vision for reducing the amount and impact of wastes and will focus efforts on waste prevention and reduction by state and local government, the private sector, and citizens of the state.

Future Capacity at Municipal Solid Waste Landfills

There are currently 18 municipal solid waste landfills operating as of September 2004. (See Map A for the location of operating MSW landfills and incinerators.) The amount of remaining capacity for the 18 MSW landfills was determined by asking the facilities to report remaining permitted capacity, as well as the expected closure date. In 2004, the facilities estimated about 214 million tons, or about 47 years, of capacity at the current disposal rate.[49] In 1994, facilities reported approximately 181 million tons of remaining capacity, about 49 years of remaining capacity statewide.[50] 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 18 currently operating landfills, only six have greater than six years of remaining permitted capacity. (See Table 6.12 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.

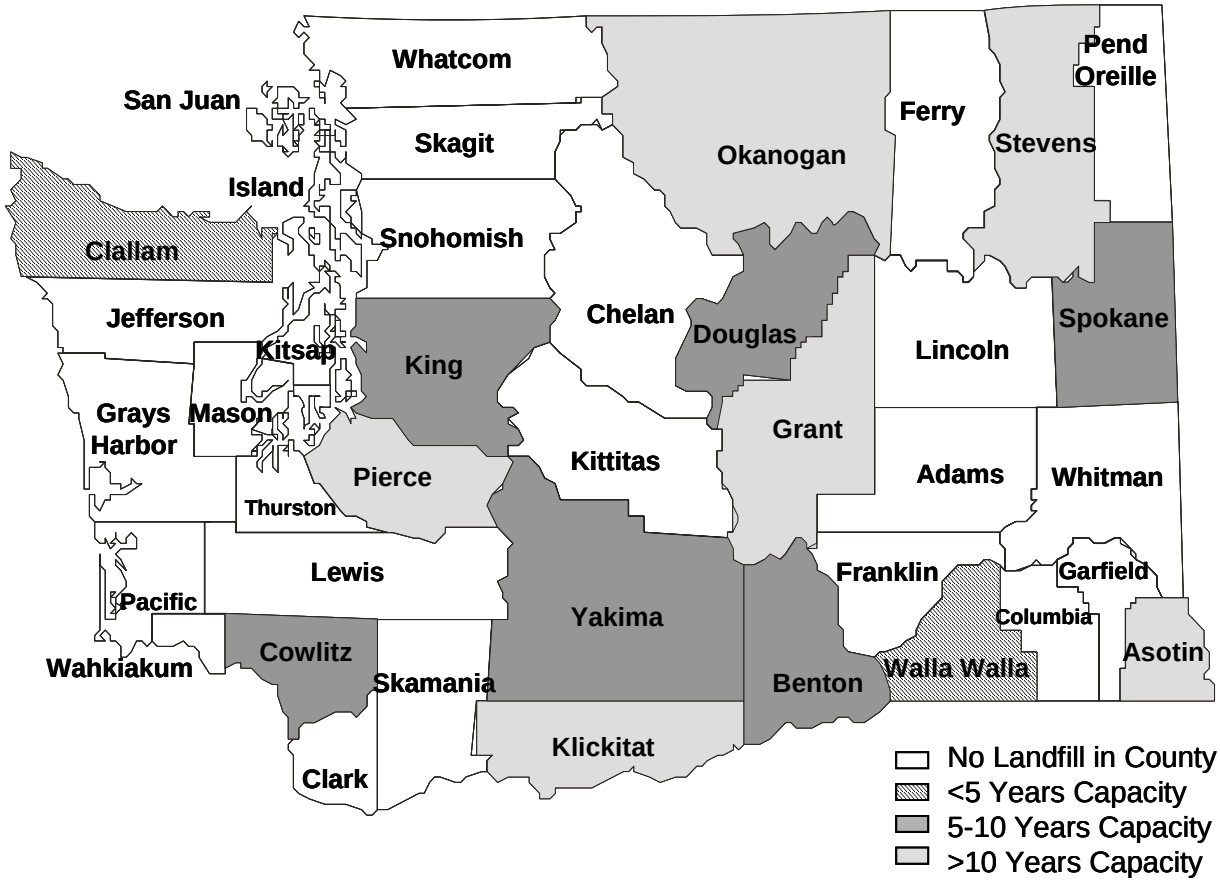
Table 6.12
Estimated Years to Closure for MSW Landfills

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

[49] This does not include a site in Adams County that has been permitted for 90,000,000 tons. Construction start of this facility is undecided at this time

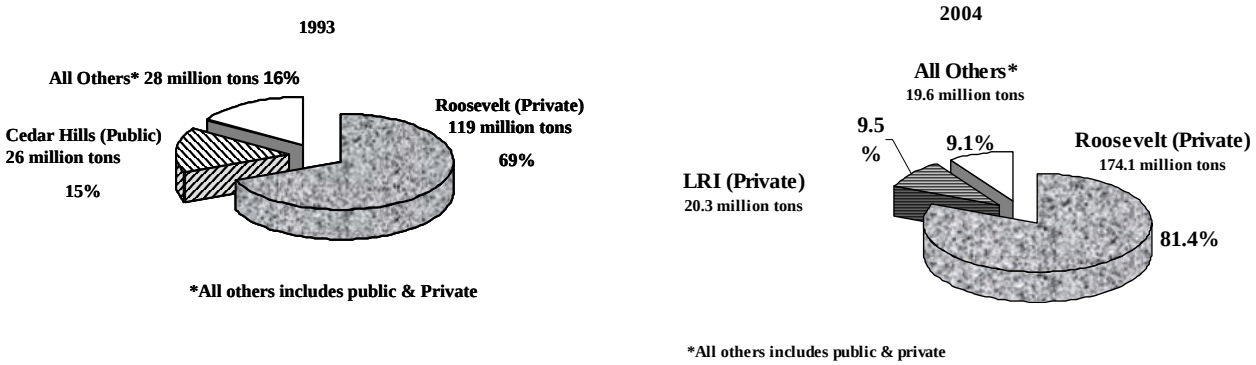
[50] *Solid Waste in Washington State - Third Annual Status Report*, Department of Ecology, Publication #94-194, December 1994.

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



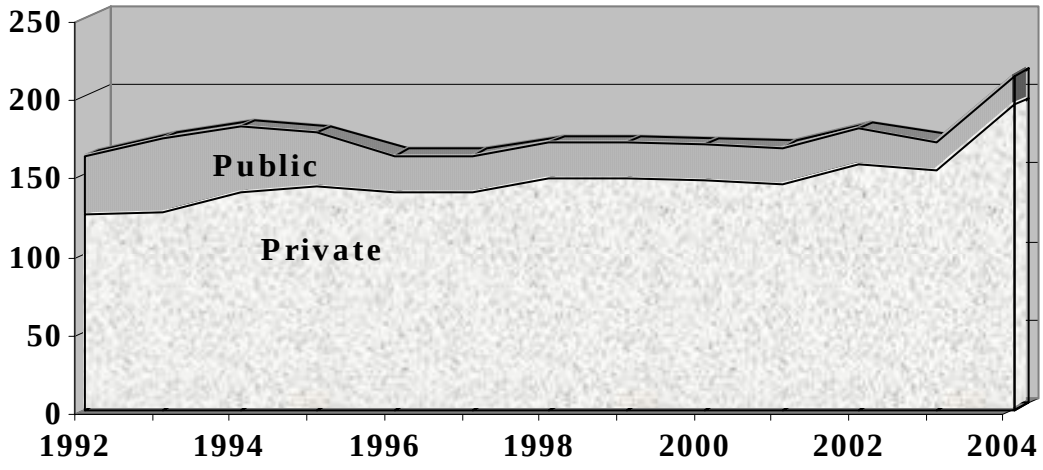
2004 capacity numbers indicated that 92% of the remaining capacity was at landfills with greater than 10 years to closure. Fourteen of the 18 operating MSW landfills are publicly owned with about 10% of the remaining capacity (18.1 million tons). About 91% of the remaining permitted capacity (195 million tons) is at the four privately-owned facilities, compared to 73% in 1993. The majority of the capacity, about 81% of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 9% of the statewide total capacity is at newly constructed, privately owned landfill in Pierce County, 4% at the publicly owned Cedar Hills landfill in King County, with the remaining 6% of capacity spread among the remaining 15 landfills in the state (see Figure 6.7).

Figure 6.7
Comparison of Remaining Permitted Capacity
1993 and 2004



The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992. (Figure 6.8).

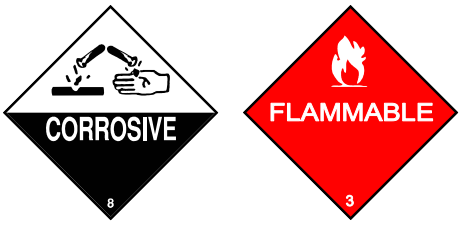
Figure 6.8
Remaining Capacity MSW Landfills
(public/private in million tons)



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 2003, the facility received some type of solid waste from 34 counties in Washington, including the majority of the solid waste from thirteen counties. Waste was also received from Alaska, Oregon, British Columbia and a small amount from California. 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.

The 47 year estimate of total remaining permitted capacity is based on the amount of waste disposed in MSW landfills in 2003. This amount will vary depending upon waste reduction and recycling activities, population growth or decline, 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 Collection System



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) 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 FACTOIDS

- Total MRW collection in 2003 was over 29 million pounds.
- The average amount of HHW disposed by the 8.4% of all households that used a HHW collection event or fixed facility was almost 85 pounds.
- The counties that had the most CESQG waste per capita were Yakima, Whatcom and Grays Harbor.
- The counties that collected the most used oil per Housing Unit were Columbia, Mason, Skamania, Cowlitz, and Stevens.
- The counties that had the largest percentage of participation per housing unit at HHW events or facilities were Klickitat, Mason, Pend Oreille, Spokane, and Thurston.
- The three categories of waste type that increased the most in amounts collected are Flammable Poison Gas, Oil with PCB's, and CRT's.

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 know a 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. While the bulk of material collected continues to be HHW, CESQG collection programs have increased. Currently there are twenty-one public MRW programs that collect CESQG waste, sixteen at fixed facilities.

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 & disposal Assistance, MRW public education, MRW enforcement and HHW collection.

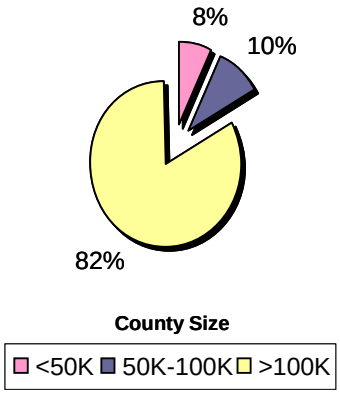
Annual Reporting and Accuracy of Data Collection

Local programs are required to submit MRW report forms annually. For the past few years, Ecology has requested annual reports be received by March for 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, 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.

Ecology has created and circulated a standard reporting form to all MRW programs; however, the reported data can vary depending on a program's collection process, how the data is reported, and how the reported data is interpreted.

For the 2003 reporting year only a couple counties had no activity. In addition, not every program reported all the required information. The most common omissions were program costs and participation numbers. This report will note key areas where there is unusual data or anomalies.

Figure 7.1
Percent of Population



Year 2003 Data

This year's report focuses on year 2003 data with some comparisons to the data published in previous year's reports. In an attempt 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 thousand to 100 thousand, and populations greater than 100 thousand.

In Washington State there are 42 programs that manage MRW. All programs are required to provide individual MRW reports. 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). King County data is segregated from Seattle data.

Many HHW collection systems are approaching stability. Most of the state is now serviced with permanent fixed facilities. The following counties do not have fixed facilities:

Chelan Clallam Douglas Ferry Garfield Grant Wahkiakum

Garfield residents use the facility in Asotin County; 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.

Collection services for CESQG's continue to expand statewide. For 2003, there are sixteen fixed facilities accepting material from CESQG's and there were four collection events providing collection services for CESQG's.

Table 7.1
Individual County Population by Size

<50K	
Adams	16,600
Asotin	20,600
Columbia	4,100
Douglas	33,600
Garfield	7,300
Garfield	2,400
Jefferson	26,700
Kittitas	35,200
Klickitat	19,300
Lincoln	10,100
Okanogan	39,600
Pacific	20,900
Pend Oreille	11,800
San Juan	14,800
Skamania	9,900
Stevens	40,600
Wahkiakum	3,800
Whitman	41,000
<50K total	462,000

50K-100K	
Chelan	67,900
Clallam	65,300
Cowlitz	94,900
Franklin	53,600
Grant	77,100
Grays Harbor	68,800
Island	74,000
Lewis	70,400
Mason	50,200
Walla Walla	55,800
50K-100K total	574,200

>100K	
Benton	151,600
Clark	372,300
King*	1,207,400
Kitsap	237,000
Pierce	733,700
Skagit	106,700
Snohomish	637,500
Spokane	428,600
Thurston	214,800
Whatcom	174,500
Yakima	226,000
Seattle*	571,900
>100K total	5,062,000

*King excludes Seattle

MRW Collected

As shown in Table 7.2, Washington collected over 16 million pounds of HHW, 11.7 million pounds of used oil (UO) from collection sites, and over 1.3 million pounds of CESQG waste, for a total of over 29 million pounds of MRW collected during 2003. Although CESQG collection has leveled off, both used oil and HHW have increased moderately.

Table 7.2
Total Pounds per Waste Category for Years
1998, 1999, 2000, 2001, 2002 and 2003

Collection Year	HHW lbs. (no UO)	Used Oil lbs.	CESQG lbs.	Total MRW lbs.
1998	9.6M	9.2M	500K	19.3M
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

Collection by Waste Category and Type

As shown in Table 7.3, the dominant types of MRW collected in 2003 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 specific waste types accounted for 91% of the estimated 29.0 million pounds of MRW collected in 2003. These are the same top five HHW types since 1998.

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

Table 7.3
MRW Six Dominant Waste Types Collected in 2003

Waste Type	Total Lbs.
Oil Non-contaminated	12,056,418
Oil Based Paint	4,806,257
Latex Paint	4,241,293
Lead Acid Batteries	2,390,580
Flammable Liquids	1,702,373
Latex Paint, contaminated	1,092,040
Total	**26,288,961**

Table 7.4
Total Pounds of MRW Collected by Waste Category

Waste Type	HHW	CESQG	Total
Acids	168,053	19,265	187,318
Lead Acid Batteries	2,347,063	43,517	2,390,580
Antifreeze	518,559	138,210	656,769
Bases	159,876	22,741	182,617
Bases, aerosols	2,655	1	2,656
Electronic	62,695	17,986	80,681
CRT's	60,622	123,372	183,994
Chlorinated Solvents	16,736	2,420	19,156
N/NIMH.Lith	41,940	2,393	44,333
Dry Cell Batteries	217,969	4,056	222,025
Flammable Solids	26,136	8,787	34,923
Flammable Liquids	1,666,618	135,755	1,802,373
Flammable Liquids, aerosols	48,802	4,813	53,615
Flammable Liquids Poison	121,519	4,462	125,981
Flammable Liq. Pois., aerosols	42,730	935	43,665
Flammable Gas	102,683	2,122	104,805
Flammable Gas Poison	3,692	2,269	5,961

Waste Type	HHW	CESQG	TOTAL
Flammable Gas Pois., aerosols	14,315	28	14,343
Latex Paint	4,156,338	84,955	4,241,293
Latex Paint, contaminated	1,091,776	264	1,092,040
Oil-Based Paint	4,575,311	230,946	4,806,257
Oil Contaminated	89,892	30,374	120,266
Oil Filters	14,764	44,741	59,505
Oil Filters Crushed	1,012		1,012
Oil Non-Contaminated	2,097,513	307,230	2,404,743
Oil Non-Contaminated Off-site*	9,651,675		9,651,675
Oil with Chlorides	1,722	6,954	8,676
Oil with PCBs	15,133	3,252	18,385
Other Dangerous Waste	30,162	52,769	82,931
Organic Peroxides	2,498	68	2,566
Oxidizers	33,401	2,276	35,677
Mercury	2,709	43	2,752
Pesticide/Poison Liq	323,407	11,587	334,994
Pesticide/Poison Sol	116,047	6,450	122,497
Reactives	1,500	373	1,873
MRW TOTAL	**27,804,984**	**1,315,413**	**29,120,397**

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

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
49 MRW Facilities as of 2003

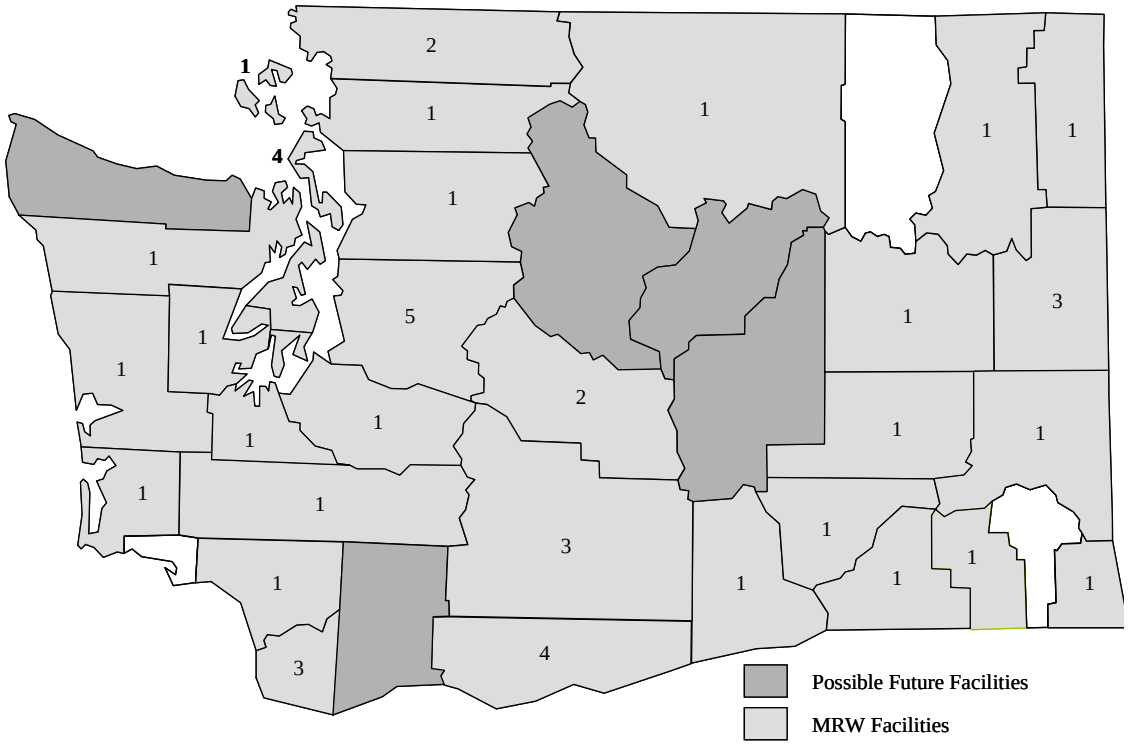


Table 7.5 shows various data by county. This information can be used to evaluate efficiencies within each county by comparing costs per participant and percentage of participants per housing units. Housing Units are the number of households in each county. This data is used instead of per capita because participants typically represent a household.

Table 7.5
Various Data by County

County	Housing Units*	HHW Participants	% Participant /Housing Unit	HHW Cost /Participant	HHW lbs. /Participant	HHW Ttl. lbs.	HHW,SQG, and Used Oil Ttl. lbs.
Adams	6,020	P N R			CNR	8,343	27,630
Asotin	9,311	946	10.2%	$53.85	92.25	87,265	93,297
Benton	59,745	7,299	12.2%	$34.65	62.47	456,003	502,748
Chelan	31,429	735	2.3%	$94.43	87.78	64,519	124,951
Clallam	31,976	795	2.5%	$73.96	71.49	56,832	353,541
Clark	146,072	5,153	3.5%	$63.54	277.98	1,404,656	2,166,534
Columbia	2,096	285	13.6%	C N R	44.22	12,604	84,870
Cowlitz	40,157	1,457	3.6%	$80.85	289.79	422,223	806,481
Douglas	13,517	389	2.9%	$70.65	116.31	45,244	106,081

County	Housing Units*	HHW Participants	% Participant /Housing Unit	HHW Cost /Participant	HHW lbs. /Participant	HHW Ttl. lbs.	HHW,SQG, and Used Oil Ttl. lbs.
Ferry	3,919	P N R		C N R		1,031	1,531
Franklin	17,776	P N R		C N R		1,593	142,637
Garfield	1,296	4	0.3%	C N R	31.25	125	127
Grant	30,418	540	1.8%	$91.50	95.83	51,748	84,654
Grays Harbor	33,211	1,580	4.8%	$99.86	57.09	90,205	379,273
Island	34,452	3,071	8.9%	$53.66	77.90	239,244	426,912
Jefferson	14,965	1,054	7.0%	$102.94	42.90	45,214	131,505
King	494,530	27,705	5.6%	$79.32	79.24	2,195,306	4,701,056
Seattle	280,883	15867	5.6%	$80.89	81.17	1,282,239	1,282,239
Kitsap	96,635	5,679	5.9%	$107.91	124.46	706,782	1,184,389
Kittitas	17,385	P N R		C N R		428,897	486,526
Klickitat	9,138	8,576	93.8%	5.17	10.14	86,957	138,343
Lewis	30,948	1353	4.4%	$56.20	102.20	138,277	377,926
Lincoln	5,461	P N R		C N R		1,000	1,000
Mason	26,842	8,137	30.3%	$10.25	10.98	89,341	684,353
Okanogan	19,733	334	1.7%	218.86	206.04	68,819	97,478
Pacific	14,280	222	1.6%	30.43	64.00	14,207	93,404
Pend Oreille	6,932	1,554	22.4%	$274.88	28.27	43,928	62,865
Pierce	294,010	28,535	9.7%	$13.59	59.62	1,701,246	1,840,860
San Juan	10,519	229	2.2%	$132.37	261.21	59,818	136,457
Skagit	44,946	2,632	5.9%	$47.58	179.82	473,289	645,121
Skamania	4,816	125	2.6%	112.40	135.58	16,948	70,180
Snohomish	251,998	16,072	6.4%	$34.18	102.12	1,641,252	3,355,345
Spokane	182,298	38,500	21.1%	$2.90	26.60	1,023,985	1,684,435
Stevens	18,341	637	3.5%	$57.51	97.83	62,316	217,938
Thurston	91,543	17,499	19.1%	$40.24	216.65	3,791,117	4,228,963
Wahkiakum	1,869	32	1.7%	$29.94	78.13	2,500	11,232
Walla Walla	21,671	1,671	7.7%	$86.11	47.30	79,035	136,119
Whatcom	78,880	5,410	6.9%	$36.97	168.02	908,984	1,053,505
Whitman	17,176	1,529	8.9%	$23.43	27.66	42,295	42,295
Yakima	81,666	3,185	3.9%	$92.79	96.68	307,922	1,496,708
Statewide	**2,578,860**	**208,791**	**8.4%**	**N/A**	**84.83**	**18,153,309**	**29,120,395**

P N R: Participants not reported
C N R: Costs not reported

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 use of facilities or events, and/or have very convenient locations of their collection facilities.

Cost per Participant

Although there could be many variables to determining the cost per participant, including average quantity received within that county to a basic level of program cost and relatively few participants. 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 collections was almost 85.

Table 7.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2001, 2002, and 2003.

Table 7.6
High Collections of HHW (no UO Sites) Pounds Per Capita by County in 2001-2003

HHW 2001		
County	**Size**	**Lbs./ Capita**
Cowlitz	50K-100K	9.46
Pend Oreille	<50K	7.16
Mason	<50K	6.26
King	>100K	4.65
Whatcom	>100K	4.62

HHW 2002		
County	**Size**	**Lbs./ Capita**
Island	50K-100K	6.04
Whatcom	>100K	5.25
San Juan	<50K	4.69
Yakima	>100K	4.46
Skagit	>100K	4.24

HHW 2003		
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

Data

There were five counties, who did not submit complete data on their reports. Adams, Ferry, Franklin, Kittitas, and Lincoln did not submit participation numbers. Adams, Columbia, Ferry, Franklin, Garfield, Kittitas, and Lincoln counties did not submit their program costs.

Conditionally Exempt Small Quantity Generator (CESQG)

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

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

Also Included in CESQG waste totals for year 2003 are data from Philip Services, who 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 the dominant four types of CESQG waste collected in 2003 were non-contaminated oil, oil based paint, antifreeze and flammable liquids.

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

Waste Type	Total lbs. CESQG	Waste Type	Total lbs. CESQG
Oil Non-Contaminated	307,230	Flammable Solids	8,787
Oil based Paint	230,946	Oil w/Chlorides	6,954
Antifreeze	138,210	Pesticide Poison, solid	6,450
Flammable Liquids	135,755	Flammable liquid aero	4,813
CRT's	123,372	Flammable liq poison	4,462
Latex Paint	84,955	Batteries, Dry Cell	4,056
Oil Filters	44,741	Oil with PCB's	3,252
Lead Acid Batteries	43,517	Chlorinated Solvents	2,420
Latex Paint, contamin.	30,374	N/NIMH/Lith Batteries	2,393
Bases	22,741	Oxidizers	2,276
Acids	19,265	Flam. Gas Poison	2,269
Electronics	17,986	Flammable Gas	2,122
Pesticide/Poison Liq.	11,587	All Other	54,480
		TOTALS	**1,315,413**

Used Oil Sites

In 2003, reported used oil collection sites yielded 11,749,188 pounds of used oil. Used oil collection by county size showed variability in pounds per capita. For example, both Columbia and Adams Counties had unusually high used oil collection, yet had very low numbers for HHW collection. This may be explained by the combination of a low population county and a high incidence of farming activity. See Table 7.8 for the six counties with the highest collections in pounds per capita by county size for 2001, 2002 and 2003.

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 - 2001		
County	**Size**	**Lbs./ Capita**
Mason	<50K	4.0
Stevens	<50K	4.0
King	>100K	3.9
Cowlitz	50K-100K	3.5
Skamania	<50K	3.2
San Juan	<50K	3.0

Used Oil Sites - 2002		
County	**Size**	**Lbs./ Capita**
Columbia	<50K	17.6
Adams	<50K	12.3
Stevens	<50K	4.0
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

Statewide Level of Service

The US Census Bureau reports that as of 2003 there were an estimated 2,578,860 Housing Units[51] in Washington State. MRW Annual Reports revealed there were 208,791 participants. Adams, Ferry, Franklin, Kittitas, and Lincoln 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). Also because some participants that are counted at events or by facilities bring HHW from multiple households and the number of participants at the counties listed above where they were not counted, the number of households served can be estimated by adding ten percent to the participant values for an estimated 229,670 households served in 2003. This number represents 8.9% of all households in Washington State. This is an increase from the 6.8 and 6.1% of 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.

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

Trends in Collection

As fixed facilities continue to gain popularity, the numbers of collection events are 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.

New Waste Streams

MRW collection programs are well established statewide. Many of these programs are exploring management of various other components of municipal solid waste. Mercury-containing lamps and electronic wastes are two of these emerging waste types.

There is a need to pay attention to the collection of mercury waste streams. Fluorescent and high intensity lamps contain small amounts of mercury. There will be an estimated 35 tons of mercury discharged into the atmosphere from the 550 million lamps currently in use by Americans (Greskovich 1997).

Used electronics are also 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).

As technology continues to lead 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 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. By the year 2010, predictions for this waste sub-stream will double (Ecology 1999). We started data on this waste stream in 2001, and in one year (2002 vs 2003) it has more than doubled, further, we expect this waste stream to increase as more collection facilities collect this waste type.

APPENDIX A
State Map with County Names

State Map with County Names

APPENDIX B
Facility Specific Disposal Data for 2003

Table B.1
2003 Total Waste Disposed in Municipal Solid Waste Landfills

Landfill	County	MSW	Demo	Ind	Inert	Comm	Wood	Sludge	Asb	PCS	Tires	Medical	Other	Total Waste
Asotin County	Asotin	40,800	0	0	0	0	0	0	0	0	0	0.00	0	**40,800**
Cedar Hills	King	976,424	0	617	0	0	0	0	150	0	0	0.00	2,787	**979,978**
Cheyne Road	Yakima	66,407	0	0	0	0	0	0	0	0	0	0.00	0	**66,407**
Cowlitz Co - B	Cowlitz	49,751	5,141	2,565	0	28,307	0	0	7	0	7	0.00	0	**85,778**
Delano	Grant	2,830	1,500	0	625	525	0	0	0	0	0	0.00	0	**5,480**
Ephrata	Grant	60,501	0	4,125	0	0	0	0	1	0	134	0.00	242	**65,003**
Fort Lewis #5	Pierce	0	530	0	33	0	9	0	0	312	0	0.00	10	**894**
Greater Wenatchee Reg. Landfill	Douglas	130,173	0	0	0	0	0	874	965	17,494	158	0.00	932	**150,596**
Horn Rapids Landfill	Benton	35,556	7,239	2,099	1,977	18,286	0	893	0	20	0	0.00	0	**66,070**
LRI Landfill (304th Street)	Pierce	488,077	14,605	0	0	37,996	0	0	1,417	128,935	0	2,404.00	102,752	**776,186**
New Waste Inc. Landfill (closed 02)	Franklin	0	0	0	0	0	0	0	0	0	0	0.00	0	**0**
Northside	Spokane	4,085	12,471	0	0	0	0	0	0	0	0	0.00	0	**16,556**
Okanogan Central	Okanogan	23,725	0	0	0	0	5	0	4	0	15	0.00	458	**24,207**
Olympic View Landfill (stopped MSW 7/02)	Kitsap	0	0	0	0	0	0	0	0	56,553	0	0.00	0	**1,923,230**
Port Angeles	Clallam	35,963	0	2,660	0	7,922	0	0	2	4,042	0	0.00	0	**50,589**
Roosevelt	Klickitat	1,224,739	281,454	197,756	0	0	47,608	21,668	6,491	134,464	9,050	0.00	0	**1,923,230**
Snohomish Regional Landfill (NOT OPEN YET)	Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Stevens County	Stevens	24,753	1,129	3,096	0	0	0	0	0	352	135	0.00	3,183	**32,648**
Sudbury Road	Walla Walla	60,208	0	0	0	0	0	0	90	0	13	55.00	0	**60,366**
Tacoma, City of	Pierce	7,260	0	0	0	0	0	0	2	0	0	0.00	0	**7,262**
Terrace Heights	Yakima	163,176	0	0	0	0	0	0	496	0	0	0.00	0	**163,672**
	TOTAL	**3,394,428**	**324,069**	**212,918**	**2,635**	**93,036**	**47,622**	**23,435**	**9,625**	**342,172**	**9,512**	**2,459**	**110,364**	**4,572,275**

Table B.2
2003 Total Waste Disposed Energy Recovery/Incinerators

Facility Name	MSW	Demo	Ind	Inert	Comm	Wood	Sludge	Biomedical	Tires
City of Tacoma Steam Plant (inactive02)	0.00	0.00	0.00	0.00	0.00	10,035.00	0.00	0.00	0.00
Inland Empire Paper	0.00	0.00	0.00	0.00	0.00	11,335.00	0.00	0.00	0.00
Ponderay Newsprint Co.	0.00	0.00	17,623.00	0.00	0.00	0.00	0.00	0.00	0.00
Spokane Regional Waste to Energy Facility	264,985.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	**264,985.00**	**0.00**	**17,623.00**	**0.00**	**0.00**	**21,370.00**	**0.00**	**0.00**	**0.00**

Continued from above table

Facility Name	Special	Other	Total
City of Tacoma Steam Plant (inactive02)	0.00	0.00	**0.00**
Inland Empire Paper	0.00	0.00	**10,035.00**
Ponderay Newsprint Co.	0.00	0.00	**28,958.00**
Spokane Regional Waste to Energy Facility	0.00	0.00	**264,985.00**
TOTAL	**0.00**	**0.00**	**303,978.00**

Table B.3
2003 Total Waste Disposed Inert/Demolition Waste Landfills

Facility	Demo	Ind	Inert	Comm	Wood Wst	Sludge	Asbestos	PCS	Tires	13?	Total Waste
Adams Street Inert Waste Disposal	0.00	0.00	1,310.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,310.00**
ALCOA Inert Waste/Demolition	0.00	0.00	273.00	0.00	0.00	0.00	11.00	0.00	0.00	0.00	**284.00**
Anderson Demolition Site	32,828.00	2,447.00	0.00	0.00	0.00	0.00	0.00	2,305.00	0.00	0.00	**37,580.00**
Asotin County I & D Landfill	2,694.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,694.00**
Asphalt & Gravel Products, Inc.	9,877.00	0.00	0.00	0.00	298.00	0.00	0.00	0.00	0.00	0.00	**10,175.00**
Busy Bee Landfill	5,443.00	0.00	3,401.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**8,844.00**
Caton Inert & Demo Landfill	7,422.00	0.00	5,173.00	0.00	784.00	0.00	0.00	0.00	0.00	0.00	**13,379.00**
Central Pre-Mix Site (Carnahan)	0.00	0.00	8,750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**8,750.00**
Central Pre-Mix Site (Fort Wright) **CLOSED**		0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00	0.00	**0.00**
Chester Landfill (closing fall 2004)	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,500.00**
Christian Inert Waste Landfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
City of Kennewick Inert/Demo	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	2,668.00	2,668.00	**3,118.00**
City of Palouse Inert/Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Clark Inert Landfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
County Construction Recyclers, Inc.	16,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**16,000.00**
Coupeville Demolition LF **(closed 6/02)**		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
D & N Enterprises	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Douglas County Lux Pit (Nile 99.1)	0.00	0.00	1,444.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,444.00**

Continued from Table B.3
2003 Total Waste Disposed Inert/Demolition Waste Landfills

Facility	Demo	Ind	Inert	Comm	Wood Wst	Sludge	Asbestos	PCS	Tires	13?	Total Waste
Duke's Hill Resource Center	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Fillion Inert/Demo Site	2,330.00	0.00	3,175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**5,505.00**
Humbert Demolition Landfill	0.00	0.00	1,464.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,464.00**
Inland Asphalt Landfill	0.00	0.00	28,750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**28,750.00**
Inland Crestline Recycling	0.00	0.00	27,875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**27,875.00**
Kaiser-Mead Inert & Demo Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Kittitas County Inert & Demo	16,529.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**16,529.00**
McChord Inert Waste Landfill	0.00	0.00	129.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**129.00**
Naval Magazine Indian Island CDL	1,389.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,389.00**
Pipkin/Handley Landfill	0.00	0.00	8,674.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**8,674.00**
Prosser Inert/Demo Landfill	96.00	0.00	453.00	0.00	0.00	0.00	0.00	0.00	0.00	173.00	**461.00**
Ray McCown Inert Waste Landfill **(to close possibly 11/04)**	0.00	0.00	901.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**901.00**
Rinker Materials	0.00	0.00	43,151.00	0.00	0.00	0.00	0.00	129,567.00	0.00	0.00	**172,718.00**
Stumpf Inert Waste Landfill	0.00	0.00	9,215.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**9,215.00**
Tolt Backwash Solids Landfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
TransAlta Centralia Mining LLC	400.00	79,027.00	347.00	0.00	0.00	0.00	0.00	0.00	664.00	0.00	**80,438.00**
Whitman College (Spokane Rock Pro)	0.00	0.00	14,453.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**14,453.00**
Yakima Training Center Inert/Demo	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,000.00**
TOTAL	**95,008**	**81,474**	**163,435**	**0.00**	**1,082**	**0.00**	**11**	**131,872**	**664**	**2,841**	**476,387**

Table B.4
2003 Total Waste Disposed Limited Purpose/Special Use Facilities

Facility Name	Demolition	Industrial	Inert Wst	Comm'l	Wood Wst	Sludge	Asbestos	PCS	Tires	Other	Total Waste
Boise Cascade/Rufener Limited	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**0.00**
Purpose Landfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**0.00**
Dickson - CDL - So 50th & Tyler St	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**0.00**
Dickson -East 48th & Waller Road Fill Site	0.00	0.00	123,663.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**123,663.00**
Graham Road Recycling & Disp	41,790.00	753.00	29,879.00	0.00	1,860.00	0.00	1,234.00	4,607.00	81.00	19,737	**99,941.00**
Intalco Aluminum Corp	0.00	597.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**597.00**
Kettle Falls Generating Station Wood Ash	0.00	34,436.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**34,436.00**
Lady Island Limited Purpose Landfill	0.00	0.00	3,561.00	0.00	6,535.00	0.00	0.00	0.00	0.00	0	**10,096.00**
Lawson Limited Purpose Site	0.00	27,178.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**27,178.00**
Port Townsend Paper	0.00	8,880.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**8,880.00**
Simpson Dayton Landfill	0.00	1,266.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**1,266.00**
Sunfresh Onion Limited Purpose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**0.00**
TPS Technologies Inc (PCS treatment)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**0.00**
Weyerhaeuser Regional Landfill	26,127.00	252,753.00	328.00	0.00	25.00	0.00	0.00	283.00	0.00	0	**279,516.00**
Whitman Co. Limited Purpose Landfill	1,029.00	0.00	0.00	0.00	0.00	0.00	68.00	0.00	0.00	0	**1,097.00**
Total	**68,946.00**	**325,863.00**	**157,431.00**	**0.00**	**8,420.00**	**0.00**	**1,302.00**	**4,890.00**	**81.00**	**19,737.00**	**586,670.00**

Table B.5
2003 Total Waste Disposed for Woodwaste Landfills

Facility Name	Demolition	Industrial	Inert Wst	Comm'l	Wood Wst	Sludge	Asbestos	PCS	Tires	Total Waste
Hampton Lumber Mills – WA, Inc.	0	0	0	0	0	0	0	0	0	**0**
Quality Veneer & Lumber (closed 2000)	0	0	0	0	0	0	0	0	0	**0**
Son Cedar Woodwaste Landfill	0	0	0	0	0	0	0	0	0	**0**
Stafford Creek Woodwaste Landfill	23,495	0	0	0	10,693	0	0	0	0	**34,188**
Total	**23,495**	**0**	**0**	**0**	**10,693**	**0**	**0**	**0**	**0**	**34,188**

Table B.6
2003 Total Feedstocks Composted

Company	County	Yard waste	Land-clearing Debris	Crop Residues	Other wood waste	Sawdust	Biosolids	Pre-consumer vegetative food waste	Manure	Other food waste	Mixed municipal solid waste	Other	Total Waste
Bailand Farms YW Composting	Snohomish	21,000.00	0.00	0.00	0.00	0.00	0.00	0.00	6,000.00	0.00	0.00	0.00	**27,000.00**
Cascade Compost (Sunland Bark/Topsoil)	Skagit	0.00	0.00	0.00	520.00	244.00	0.00	0.00	1,905.00	0.00	0.00	0.00	**2,669.00**
Cedar Grove Composting, Inc.	King	158,000.00	1,800.00	0.00	2,100.00	0.00	0.00	4,900.00	0.00	20.00	0.00	0.00	**166,820.00**
Chelan County Public Works	Chelan	0.00	0.00	0.00	110.00	0.00	89.00	0.00	0.00	0.00	0.00	500.00	**699.00**
City of Cheney - Wastewater Division	Spokane	3,659.00	0.00	0.00	880.00	0.00	220.00	0.00	0.00	0.00	0.00	0.00	**4,759.00**
City of Port Angeles	Clallam	3,309.00	0.00	0.00	0.00	0.00	1,318.00	0.00	0.00	0.00	0.00	0.00	**4,626.00**
City of Port Townsend	Jefferson	5,036.00	0.00	0.00	0.00	0.00	214.00	0.00	0.00	0.00	0.00	0.00	**5,250.00**
City of Quincy	Grant	2,126.00	0.00	0.00	442.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,567.00**
Columbia Compost	Columbia	300.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	**400.00**
Columbia Compost	Walla Walla	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,000.00**
Columbia Resource Company Transfer Station	Clark	4,297.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**4,297.00**
Cowlitz County Public Works	Cowlitz	2,192.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,192.00**
Dykstra Composting Facility	Skagit	0.00	0.00	192.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**192.00**
Green Earth Compost	Whatcom	3,460.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	190.00	**3,670.00**

Company	County	Yard waste	Land-clearing Debris	Crop Residues	Other wood waste	Sawdust	Biosolids	Pre-consumer vegetative food waste	Manure	Other food waste	Mixed municipal solid waste	Other	Total Waste
GROCO	King	0.00	0.00	0.00	0.00	9,503.00	7,536.00	0.00	0.00	0.00	0.00	0.00	**17,039.00**
H & H Wood Recyclers	Clark	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**600.00**
Hi Q Compost Facility	Skagit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.00	0.00	0.00	0.00	**26.00**
Hilltop Emu Ranch	Kitsap	123.00	96.00	0.00	0.00	149.00	0.00	0.00	349.00	0.00	0.00	0.00	**717.00**
LaConner, Town of WWTP (Water & Wastewater Services)	Skagit	150.00	0.00	0.00	0.00	1,031.00	370.00	0.00	0.00	0.00	0.00	0.00	**1,551.00**
Langley City Water and Wastewater Srv.	Island	240.00	0.00	0.00	0.00	0.00	17.00	0.00	0.00	0.00	0.00	0.00	**257.00**
Lynden, City of WWTP	Whatcom	25.00	0.00	0.00	0.00	792.00	222.00	0.00	0.00	0.00	0.00	0.00	**1,039.00**
Miller Creek Compost Facility	King	331.00	100.00	0.00	0.00	9.00	27.00	0.00	0.00	0.00	0.00	0.00	**467.00**
Monroe, City of WWTP	Snohomish	0.00	0.00	0.00	0.00	1,014.00	314.00	0.00	0.00	0.00	0.00	0.00	**1,328.00**
North Mason Fiber	Mason	4,340.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,815.00	**9,155.00**
Northwest Organics – Wilcox Farms Compost Site	Pierce	0.00	0.00	0.00	11,868.00	0.00	0.00	0.00	7,912.00	0.00	0.00	0.00	**19.780.00**
Olympic Corrections Center	Jefferson	2.00	0.00	0.00	146.00	2.00	290.00	276.00	0.00	0.00	0.00	0.00	**725.00**
Pacific Topsoils	Snohomish	47,419.00	24,950.00	0.00	10.614.00	0.00	0.00	0.00	5,363.00	90.00	0.00	0.00	**88,436.00**
Pierce County Recycling Composting & Disposal, LLC dba LRI	Pierce	40.964.00	2,821.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,560.00	**45,345.00**
Pierce County Recycling Composting & Disposal,	Pierce	23,715.00	366.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**24,081.00**

Company	County	Yard waste	Land-clearing Debris	Crop Residues	Other wood waste	Sawdust	Biosolids	Pre-consumer vegetative food waste	Manure	Other food waste	Mixed municipal solid waste	Other	Total Waste
Facility													
Purdy Topsoil & Gravel	Pierce	5,509.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,163.00	**10,672.00**
Skagit Soils	Skagit	12,524.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**12,524.00**
Soil Life Systems, Inc	Walla Walla	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,874.00	0.00	0.00	13,411.00	**16,285.00**
South Sound Soils, LLC	Thurston	1,088.00	0.00	0.00	6,503.00	0.00	9,363.00	0.00	0.00	0.00	0.00	6,510.00	**23,464.00**
Washington State University	Whitman	80.00	0.00	0.00	0.00	224.00	156.00	35.00	7,884.00	141.00	0.00	3,282.00	**11,801.00**
	Totals	**341,489.00**	**30,133.00**	**212.00**	**33,183.00**	**12,968.00**	**20,235.00**	**5,211.00**	**32,313.00**	**251.00**	**0.00**	**35,441.00**	**511,434.00**