Solid Waste In Washington State

Twelfth Annual Status Report

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Solid Waste and Financial Assistance Program

December 2003
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Prepared by:

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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

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Ellen Caywood
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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 progress toward revising the State Solid Waste Management Plan, "Beyond Waste," and the move toward sustainable future.

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 2002 statewide recycling survey results, information on waste disposal and moderate risk waste. Some of the data is for 2002 (recycling and disposal information), while other data is current to late 2003 (litter pickup numbers and facility status). A brief summary of significant information is highlighted below.

Recycling

- The 2002 recycling rate decreased slightly to 35% from 37% in 2001. The rate had remained fairly stagnant at 33-35% since 1997. This rate accounts for the "traditional recyclable materials. One reason for the slight decrease was a more accurate reporting of wood waste recycled. In 2001, some of the material that was incinerated was inaccurately counted as recycled. For 2002, this material was included in the "diverted" number.

- 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 2002, this "alternative" recycling rate was 45%.

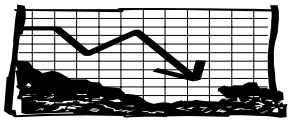
Litter Collection Efforts

- For fiscal year 2003, litter collection efforts by Ecology Youth Corps (EYC) picked up a total of 64,375 bags of litter over a total of 4,612 road miles and 438 acres. This is the equivalent of 482 tons, or 128,750 cubic feet of litter. Of this total amount of litter 8,116 bags or 61 tons were recycled.

- Other state agency programs were coordinated by SW&FAP. During Fiscal Year 2003, 3,161,054 pounds of litter and illegally dumped materials were collected by Departments of Corrections and Natural Resources, an increase from 1,402,819 pounds in fiscal year 2002.

- 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 previous cycle (July 2001-June 2003, 69,189 road miles and 6,093 illegal dump sites were cleaned. A total of 8,143,337 pounds of litter and illegally dumped materials were collected, of which 1,202,256 pounds were recycled.

Partnering for the Environment



- Ecology provided over $17.4 million in Coordinated Prevention Grants to local governments for the 2002/03 cycle. These funds leveraged local matching funds to support over $23 million worth of solid and moderate risk waste projects. Final results of these grants will be available mid-2004.

- 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".

- Organics continue to be a focus waste stream with efforts using compost and organic mulches to reduce soil erosion control and protect water quality, and experiments with the land application of waste apples.

- 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 certain pesticides.

- In the first year of the newly design "Terry Husseman Sustainability in Public School Awards Program" SW&FAP rewarded schools that embraced the sustainability principles. Fourteen schools were awarded cash prizes in one of three categories: Seed Award, Environmental Curriculum Award, and Sustainable School Award.

Disposal of Solid Waste

- In 2002, 20 municipal solid waste landfills accepted 4,744,561 tons of waste. Two of those landfills closed in 2002.

- The total amount of waste disposed in all categories of landfills and incinerators decreased slightly from 6,453,904 tons in 2001 to 6,171,407 tons in 2002.

- Currently 15 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 311,474 tons of waste in 2002, 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 incinerator woodwaste.

- The amount of waste imported decrease in 2002 to 165,935 tons from 172,696 tons in 2001. Exported waste increased in 2002 to 1,425,248 from 1,175,953 tons in 2001, with almost eight and a half 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 2003 a statewide permitted landfill capacity of 171 million tons, or approximately 36 years at the current rate of disposal. The majority of that permitted capacity (92%) is at private landfills, with Roosevelt Regional Landfill in Klickitat County accounting for 77% 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.

- In 2002, Washington collected over 13.5 million pounds of household hazardous waste (HHW), almost 9.2 million pounds of used oil (UO), and over 1.4 million pounds of conditionally exempt small quantity generator (CESQG) waste, for a total of nearly 24.3 million pounds.

Chapter I Issues Facing Solid Waste

Sustainability in Solid Waste Management

This annual report presents data on how much solid waste we are throwing away in Washington. The waste generation rate continues to rise each year (see Chapter VI Figure 6.5 for details). These numbers suggest that an increasing wastefulness has become part of our way of life. Solid waste presents an obvious indicator that we are not putting our resources to their best or most durable use.

The increase in these waste streams is not necessarily due to a growing number of purchases by consumers. We do not believe that reducing waste in our economy requires us to curtail our actual use of products. Rather, this problem can be significantly reduced by redesigning manufacturing processes, packaging, and the products themselves. The longer a product can be used, the better. The more easily a product or package can be recycled at the end of its usefulness, the better. The current system dumps the costs of its inefficiency on citizens who must pay for too much garbage disposal and too much "recycling" of items that cannot be profitably recycled at the present time.

Though they are not solid waste issues, there are other problems that result from our current way of doing business. We cannot forget that our economy creates too much pollution and uses too much energy. These resources used or damaged for the sake of immediate economic needs are reducing the resources that will be available to our children and their economy.

In short, waste reveals an economy that is maladapted to the natural cycles that have supported human and other forms of life for millennia.

We can choose products whose manufacture, transport, and aftereffects do not drain our environmental resources without replenishing those resources. Environmental resources are economic resources for the future. If we adapt ourselves so that our way of life depends on renewable resources, and our current "waste" stream is channeled into renewing those resources, we would be developing an economy that will survive. Our current practices, if carried to their ultimate conclusion, will result in an economy that has to make do with what it can mine from landfills.

The Ceiling Our Recycling Rate Appears to Have Struck

Even though our tonnage of recycling has increased, the disposal tonnage is increasing at a faster rate. This has caused Washington state's recycling rate to stagnate at around 35 to 37%. This leaves us far short of reaching our goal set at 50%.

In many areas, landfilling continues to be a cheaper option than recycling. True environmental costs are not reflected in landfill fees. Recycling markets struggle to compete with low landfill fees, subsidies for virgin materials, and low recovery rates.

In our current system, manufacturers make products, consumers purchase and use these products, and then local governments and taxpayers pay for the costs to manage the waste at the "end of the pipe." Manufacturers have little incentive to design products that minimize environmental impacts. Whenever there is a new product or design, recycling markets and local governments struggle to develop a program that will address the issue of the ensuing waste. For example, over the past several years, local governments have been struggling with how to address the growing amount of obsolete electronic equipment in the waste stream.

The development and use of products, with the resulting pollution generated at all stages, have far reaching impacts that limit our ability to achieve sustainable natural resource management and sustainable communities. Consider the following statistics:

- For every pound of product manufactured in the United States, 33 pounds of waste are generated.[1]

- The total annual material output to the environment is about 95 tons per capita in the United States.[2] At this rate and at our current population level, Washington residents release about 560 million tons of material into the environment every year.

- Even though recycling is projected to continue at the current volume and participation rate, the overall recycling rate compared to what is disposed of is projected to drop to below 20% by 2021. The highest rate reached was 38% in the mid-1990s.

Beyond Recycling

Although all recycling efforts are important and help us move towards sustainability, maybe it is time to look beyond bottle and can collection and turn our eyes "upstream," partnering with industry to create more of a true "closed loop" system. One approach is known as Product Stewardship.

As defined by the Northwest Product Stewardship Council, product stewardship "is an environmental management strategy that means whoever designs, produces, sells, or uses a product takes responsibility for minimizing the product's environmental impact throughout all stages of the products' life cycle. The greatest responsibility lies with whoever has the most ability to affect the lifecycle environmental impacts of the product."

[1] Paul Hawken et al., *Natural Capitalism*, New York, Little, Brown, 1999.

[2] Emily Matthews et al., *The Weight of Nations*, World Resources Institute, Washington, D.C., 2000.

When implemented, product stewardship provides incentives and motivation for manufacturers to think differently about resources and materials and to incorporate toxicity reduction, energy conservation, reuse and recycling into product design. It can also reduce costs to government and taxpayers for pollution control and environmental degradation, energy usage, and disposal of unusable and toxic materials by placing greater financial responsibility on manufacturers and purchasers.

A Sustainable Resource Base

Most human communities produce things for consumption and eventually dispose of them into a landfill or incinerator. If products that take a considerable amount of energy and resources to create are thrown away almost immediately, rather than recaptured for recycling, we are obligated to continue to exploit virgin resources for manufacturing. Even if we were able to recycle a great deal of our waste, we would continue to extract resources to accommodate for new population growth and to replace worn out fibers, for example. While 100% recycling is a laudable goal, there are realities that make products difficult to recycle or reuse, including economics, politics, subsidies, and labor and energy requirements. Consequently, we as a society are continuing to deplete important resources.

All of our material goods are, at some point, derived from resources extracted from the ecosystems on earth. Considering this fact, our human need to **protect natural resources** for the long term is essential for our continued material wealth. However, the increasing intrusion of humans into natural ecosystems threatens their function. If stable ecosystems are valuable for the materials that they provide us, they are absolutely essential for the life services they provide us, such as cleaning and recycling water, providing oxygen, growing food.

In order to understand the worth of these ecosystem services, some economic studies have delved into this daunting subject. One 1997 study by Costanza[3] showed that ecosystems provide $18 to $61 trillion in services a year. However, it is simplistic in some ways to place an economic value on these services, as they are "invaluable" to a large degree. (What's the price of being able to breathe?)

We can try and value ecosystems on a practical scale, however. One particularly good example of trying to value ecosystems is New York City's historic drinking water decision. The city government faced growing water quality problems in the early 1990s and chose to preserve upstate New York watersheds through conservation and restoration instead of investing billions of dollars into new water treatment facilities.

As a result of the difficulty in giving our natural resources true value in the economy, the economic gain from extracting and selling material resources has historically superseded

[3] Robert Costanza et al., "The Value of the World's Ecosystem Services and Natural Capital," *Nature*, 15 May 1997, Vol. 387: pp. 253-260.

the economic worth of intact ecosystems. We are fairly familiar with the consequences suffered by other species. They have less habitat; pollution, overharvesting, and too much hunting have reduced populations; other species have invaded; and extinctions are alarmingly frequent. Competing and increasing needs and uses for these forests, be it recreation, the timber industry, material products, revenue for schools, watershed protection, hunting, housing, and sprawl stress what our forests can provide for us. Such tensions are compounded by our own increasing need and other developing countries' needs for forest products. For example, the average American's appetite for paper products has nearly tripled in three decades to 700 pounds annually, with other countries accelerating use as well.

A Look at Our Forests[4]

- Global forest cover has been reduced by between 20 and 50 percent since pre-agricultural times.
- Nearly all forests in Europe and the United States are under management and support reduced levels of biodiversity.
- Forests, which harbor about two-thirds of the known terrestrial species, have the highest species diversity of any ecosystem, as well as the highest number of threatened species.
- Forest area has increased slightly since 1980 in industrial countries, but has declined by almost 10 percent in developing countries. Tropical deforestation probably exceeds 130,000 square kilometers a year.
- Nearly 80% of all wood fiber products comes from primary or secondary growth forests.
- Forests are the biggest natural 'sink' for carbon in the terrestrial biosphere, containing up to 1,000 billion tons or 40 percent of all the carbon stored in terrestrial ecosystems. Much of it is in the great boreal forests of the Northern Hemisphere, and the tropical forests of South America and Africa.
- Forest cover helps to maintain clean water supplies by filtering freshwater and reducing soil erosion and sedimentation-- but nearly 30 percent of the world's major watersheds have lost more than three-quarters of their original forest cover.

Such statistics are gloomy, but don't give us any guidance for establishing a "sustainable" path. Some solutions include designing for recycling, placing a true value on ecosystem functions, valuing not just local resources but global resources (for instance, avoiding products whose manufacture depends on exploited resources in other countries), using recycled material in new products, and reducing consumption of non-recycled products.

[4] From World Resources Institute http://www.wri.org/wri/wr2000/forests.html

Sustainable Energy

Washington state relies heavily on hydroelectric power. According to the Energy Information Administration, 53% of our citizens' homes are heated by electricity created from hydroelectric dams. We are fortunate to live in a region of peaks and valleys that are cut by large rivers. Our geography aids in providing us with low cost electricity. However, as water becomes a scarcer resource and the environmental impacts of the hydroelectric dams become more evident, it is imperative that we question the actual cost of hydroelectricity. It is important for us as a state to explore alternative energy sources.

Governor Locke's Sustainable Washington Advisory Panel has identified clean energy as a priority action for the state. The panel views clean energy as "a major economic development opportunity."

The Solid Waste & Financial Assistance Program (SW&FAP) took this priority as an opportunity to further explore solid waste as an energy source. Our Eastern and Central Regional Offices have been working steadily over the past year providing technical assistance to private projects wishing to better utilize organic residuals. It has become apparent that these "organic wastes" are truly "resources." These resources contain stored energy in carbon molecular structures. To further explore the potential of organic waste as stored energy, SW&FAP teamed up with the agricultural chemicals industry, the Inland Northwest Technology Education Center (INTEC), and Washington State University researchers to perform a Bioenergy Inventory and Assessment of Eastern Washington. The goal of this team was to determine the location and amount of organic resources from municipal and agricultural sources, and to estimate the potential energy that could be produced by digestion of these materials under anaerobic conditions. The results of the assessment show that Eastern Washington has an annual production of 4.3 million tons of underutilized dry biogas, which is capable of producing, via anaerobic digestion and subsequent biogas conversion, 35 trillion BTU's of heat convertible to three trillion watt hours of electrical energy, which is equivalent to around 40% of Eastern Washington's current annual residential electrical consumption. (Washington Office of Financial Management and the U.S. Energy Information Administration, http://www.eia.doe.gov/emeu/states/sep_use/res/use_res_wa.html.) The possibilities of expanding future studies to a statewide basis are being assessed.

Another possibility for alternative energy sources is landfill gas-to-energy. Klickitat County Public Utilities District (PUD) is harnessing energy from methane gas generated from Roosevelt Regional Landfill, where 75% of our state's waste finds its final resting place. The methane from the landfill at full capacity produces 10.5 megawatts, which is enough electricity to power 7,000 homes. The PUD believes that when the H.W. Hill Landfill Gas Power Plant reaches full capacity, it will generate 45 megawatts. (Klickitat County PUD website; http://www.klickpud.com/power/lfg.asp) It is important for SW&FAP to learn from this power plant, and push for smart landfill design.

Bioeneregy and landfill gas-to-energy are just a start of further exploration. Washington state needs to challenge itself to delve into other regions of clean, renewable energy

sources such as wind and solar to ensure a healthy environment, healthy humans, and a healthy economy.

Sustainable Building

The development of sustainable building practices really came about as a result of quickly converting new information into new approaches to problem solving. In the course of exploring ways to deal with construction waste, the SW&FAP also discovered new paths to our shared environmental goals embodied in the principles of sustainability. In a very real sense, the evolution of a modest construction waste management program into a statewide sustainable building initiative became a pattern setter for the entire solid waste program's exploration of sustainability.

Ten years ago, new federal landfill standards began to be phased in across the country, dramatically increasing design and construction costs for new cells. It became clear that the volume of waste going into the remaining open landfills needed to be reduced significantly to extend their useful lives. This reduction would allow time for small, financially stressed local governments to find alternative disposal options.

At that time, construction, demolition, and land clearing debris accounted for 12.6% of the waste filling up landfills in Washington[5]. The Department of Ecology (Ecology) recognized that reducing construction and demolition waste could make a significant contribution toward relieving the stress on existing landfills. Since the number of generators of construction waste is considerably smaller than for the municipal waste in general, Ecology felt this problem waste was primed for effective reduction efforts. The problem then became how best to get this construction waste out of the municipal waste stream. The Program explored options like waste bans, mandatory recycling, and other regulatory disincentives.

By coincidence, at roughly the same time, King County had just completed a behavior change study indicating that encouraging behavior change could be at least as effective as regulation and at lower actual costs than regulation.

SW&FAP management took note of this study's conclusions and took them to heart. They authorized two staff members to explore non-regulatory options for reducing construction wastes. After considerable research into the construction industry and the building design process, staff recommended pursuit of efforts to move the industry toward resource efficiency on several fronts, starting first with waste management practices.

Partnerships with waste managers, public works departments, and builders led to numerous construction waste management programs, sponsored by local governments

[5] 1992 Washington State Waste Characterization Study, Volume 4: Characterization of Special Wastes, Department of Ecology publication # 93-42, p. II-3.

and public/private partnership. Individual projects yielded significant construction waste reductions, some as high as 80%, that were well documented in numerous case studies. Most of these efforts were organized and funded by local government.

The experience of working to reduce construction waste, one building site at a time, convinced Ecology that this approach would require tremendous and continued effort. While this effort would reduce landfilling of construction waste and put more of this material into the recycling system, it couldn't solve the large problem with the industry, wasteful construction practices.

In the course of examining the industry and its processes, SW&FAP staff learned about a new approach that is reducing construction waste much more effectively and permanently. It is called sustainability. The building design and construction industry from Denver, Colorado, to Pittsburg, Pennsylvania, to Portland, Oregon, was rapidly embracing sustainability as an alternative, better way of doing business. SW&FAP quickly agreed to join this movement and explore its potential for delivering multiple benefits well beyond construction waste management.

By making this conscious choice, the Program management elected to move well upstream of the landfill and committed to work to eliminate construction waste in the first place. This radical departure from the regulatory approach to problem solving has yielded many unexpected benefits and challenges. What it revealed also was a new approach to problem solving around waste issues, one that focuses on partnerships with a new universe of stakeholders and prefers education, infrastructure, and incentive over regulation.

The sustainability principles featured prominently in the Beyond Waste plan show the way to the behavior change originally desired. It is a longer, wider, and more populated route than originally anticipated, but one on which we have lots of company.

Beyond Waste--The State Solid Waste Strategic Plan

The Department of Ecology (Ecology) continues to lead a collaborative effort to revise the state solid waste plan pursuant to state law (RCW 70.95.260). The plan is being revised in concert with the state hazardous waste plan revision (pursuant to RCW 70.105.010). Together, the two plans make up Ecology's Beyond Waste project, one of the agency's top priorities. After extensive research and consultation with other interested parties, we are working on policy recommendations to be included in a draft plan that will be out for review in early 2004.

Reducing wastes, toxic substances, and their impacts is important for our state's future. The Beyond Waste plan will propose a first set of actions to significantly reduce waste and toxic materials. These actions are in five areas that we have identified as important starting points:

- 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).

Throughout 2003, Ecology has continued in its commitment to work collaboratively with people and organizations interested in waste-related issues. Additional public meetings are planned to gather feedback once the draft plan is issued.

The Beyond Waste project is not just an Ecology initiative; the success of eliminating waste, 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.

For this collaboration to be successful, it is very important for Ecology to encourage people to be involved and engaged in the project, and to tell us what they think. 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 development. We want to develop a statewide blueprint that serves the goals of a diversity of organizations in this state.

While this is a very forward-looking plan, it will also bring attention to some current problems and situations that must be faced now. Local governments and Ecology all recognize that maintaining current solid waste facilities and services is necessary in the more immediate future.

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 2003. 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.

For 2003, Ecology has identified 454 solid waste handling facilities in Table 2.1. 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 2.2 identifies the facilities and the county in which they are located.

Table 2.1
Facility Types Statewide

Facility Type	Statewide Total
Ash Monofill	1
Municipal Solid Waste Landfills	19*
Inert/Demolition Waste Landfills	35
Limited Purpose Landfills	14
Woodwaste Landfills	4
Composting Facilities	40
Recycling Facilities	71
Recycling Facilities - Land Application	13
Landspreading Disposal Facilities	13
Energy Recovery and Incineration Facilities	4
Compacting Stations	3
Drop Boxes	67
Transfer Stations	94
Piles	15
Surface Impoundments	5
Tire Piles	2
Moderate Risk Waste Handling Facilities	49
Other	5
TOTAL ALL FACILITIES	**454**

Table 2.2
Solid Waste Facilities in Washington
(as of September 2003)

County	MSW Landfill	Wood Waste	Inert/Demolition	Limited Purpose	Ash Monofill	Compacting Station	Compost Facility	Drop Boxes	Piles	Recycling Facility	Surface Impoundments	Landspreading	Transfer Stations	Tire Piles	Incinerators	Other
Adams							1			2			2			
Asotin	1		2													
Benton	1		2					1		3		1	5	1		
Chelan			3				1			1			3			
Clallam	1			1			1			1			3			
Clark				2			2			8			2			1
Columbia							1			1			1			
Cowlitz	1			1			1	1		2			1			
Douglas	1		2									1	1			
Ferry													1			
Franklin							1		1	4			1			
Garfield													1			
Grant	2			1			1	15	1	6						
Grays Harbor		1	1						1	6	1		6			
Island			1			2	1			10	1		3			
Jefferson			1	1			2	1					1			
King	1		1				4	2		2			12			
Kitsap							1	5		2						
Kittitas			1								1		2			
Klickitat	1				1			2					3	1		
Lewis			1				1	8		1		9	3			

County	MSW Landfill	Wood Waste	Inert/Demolition	Limited Purpose	Ash Monofill	Compacting Station	Compost Facility	Drop Boxes	Piles	Recycling Facility	Surface Impoundments	Transfer Stations	Tire Piles	Incinerators	landspreading	Other
Lincoln										1		1				
Mason				1				3				1				
Okanogan	1	1										2				
Pacific								2				3				
Pend Oreille												3		1		
Pierce	3		1	3			5	1	4	14		11		1	1	
San Juan								2				1				
Skagit			1			1	5			1	2	2				
Skamania										1		3				
Snohomish	1*	2	1				4	6		1		3				1
Spokane	1		7	1			1		2	7		5		2		
Stevens	1			1					1			4				
Thurston							1	3		5		1				
Wahkiakum								1								
Walla Walla	1		1				2		1							
Whatcom			1	1			2	7	2	4		2				
Whitman			4	1			1			1		1				
Yakima	2		4				1	7	2						1	
Total	19 *	4	35	14	1	3	40	67	12	84	5	94	2	4	13	5

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

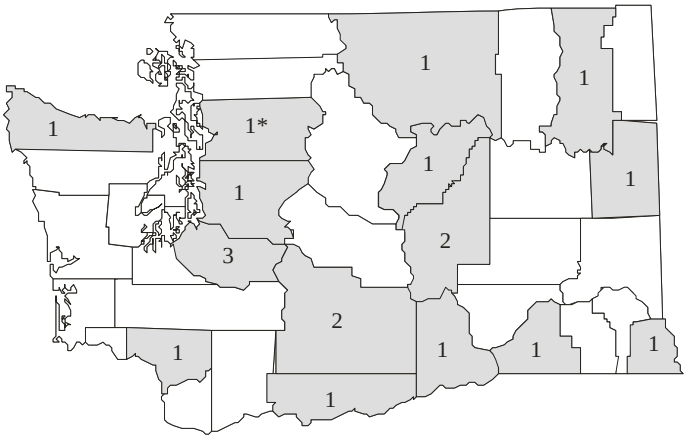
Municipal Solid Waste Landfills

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 2002, 20 operating MSW landfills accepted 4,744,561 tons of waste. (See Chapter VI for additional discussion of waste types, amounts and sources.)

In 2003, of the remaining 18 operating landfills, the majority, 78%, are operated by public entities. This has historically been true in Washington. However, while privately owned landfills comprise only 22% of the facility type, they control over 90% of the remaining capacity.

Location of MSW Landfills



Public	15
Private	4
Total	19*

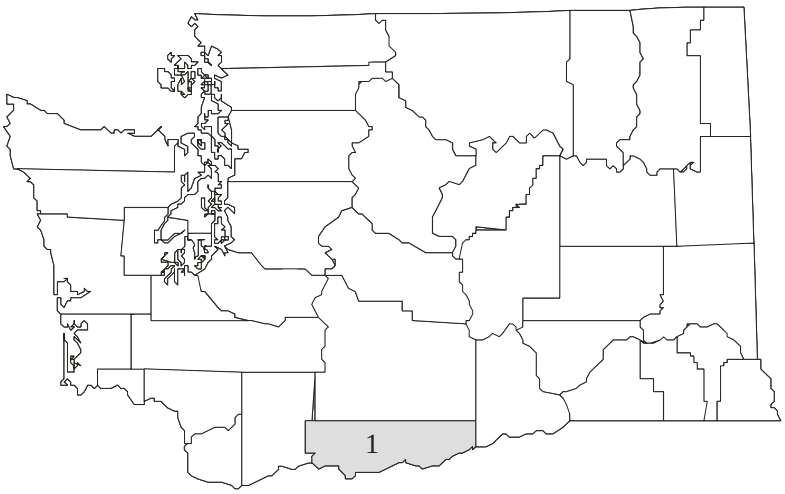
* The MSW landfill in Snohomish County is permitted but not opened.

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 2003, 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 78,121 tons of special incinerator ash in 2002.

Location of Ash Monofill



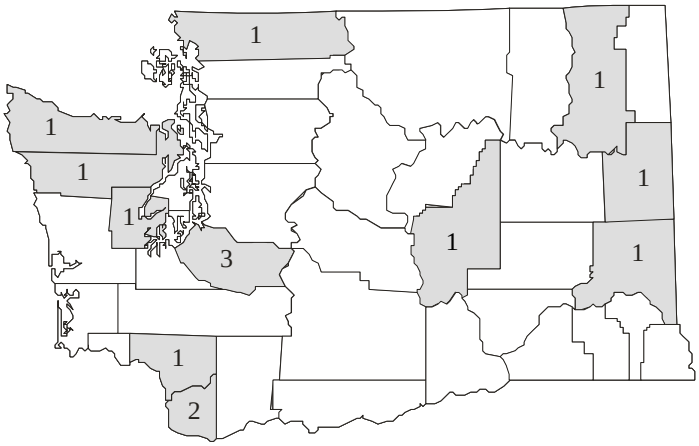
Public	0
Private	1
Total	1

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 2002, twelve limited purpose landfills reported receiving 605,284 tons of waste.

Limited Purpose Landfills



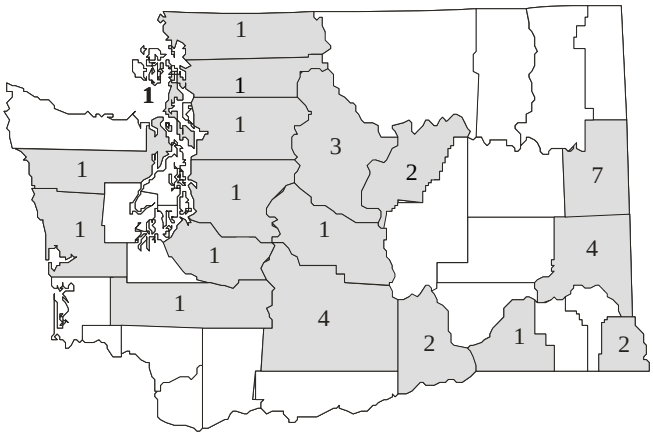
Public	1
Private	13
Total	14

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 2002, 28 inert/demolition landfills reported receiving 476,917 tons of waste. In 2003, there were 35 inert/demolition landfills listed in the state. About 69% of the inert/demolition landfills were privately owned, with 31% being publicly owned.

Location of Inert/Demolition Waste Landfills



Public	11
Private	24
Total	35

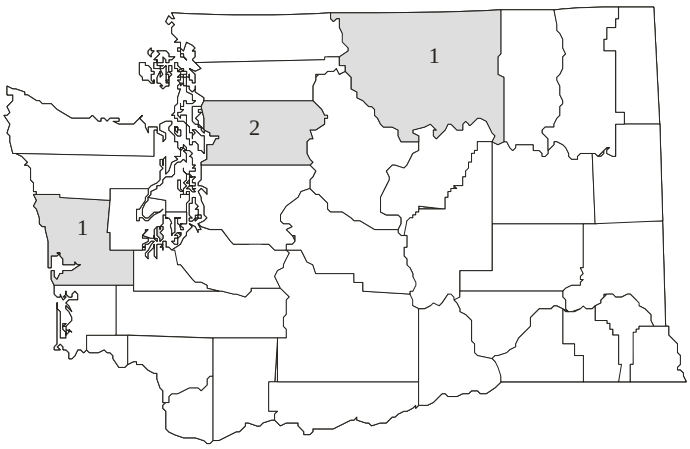
Woodwaste Landfills

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 2002, one woodwaste landfill reported 33,171 tons of waste. The remaining permitted

woodwaste landfills were either inactive or were actually removing waste. In 2003, four woodwaste landfills were listed in the state, all privately owned.

Location of Woodwaste Landfills



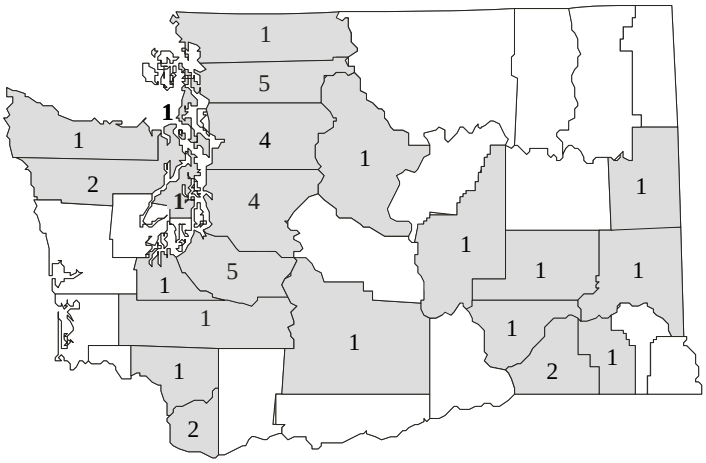
Public	0
Private	4
Total	4

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 2002, 32 composting facilities reported 587,702 tons of composted material produced. In 2003, there were 40 composting facilities identified statewide, 65% were privately owned, with the remaining 35% being publicly owned.

Location of Compost Facilities



Public	14
Private	26
Total	40

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.

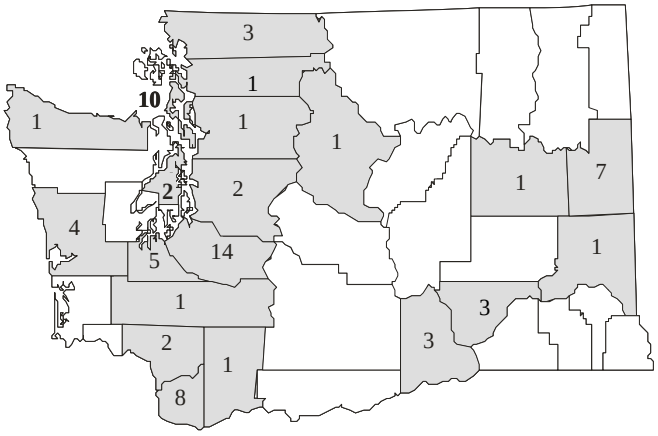
(g) Energy recovery or incineration of solid waste which is subject to WAC 173-350-240

(h) Intermediate solid waste handling facilities subject to WAC 173-350-310."

In 2003, there were 71 facilities identified as permitted recycling facilities (under the *MFS*), excluding composting facilities and land applications permits. These two facility

types are discussed in other portions of the section. The majority (90%) of the regulated recycling facilities were identified as privately owned.

Location of Recycling Facilities



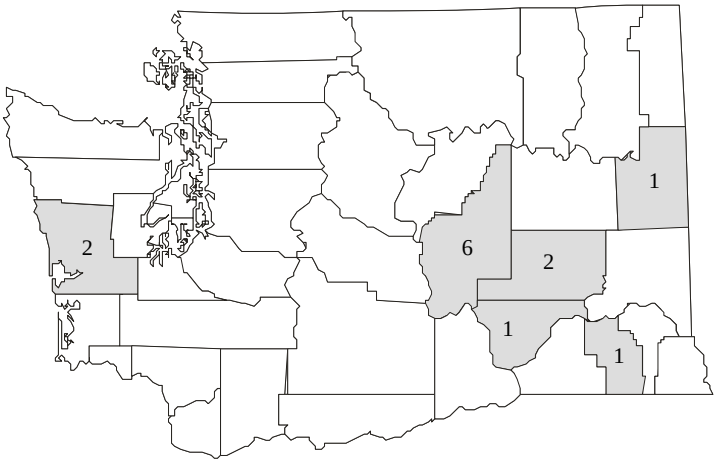
Public	7
Private	64
Total	71

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 2003, 13 private land application sites were identified.

Location of Land Applications



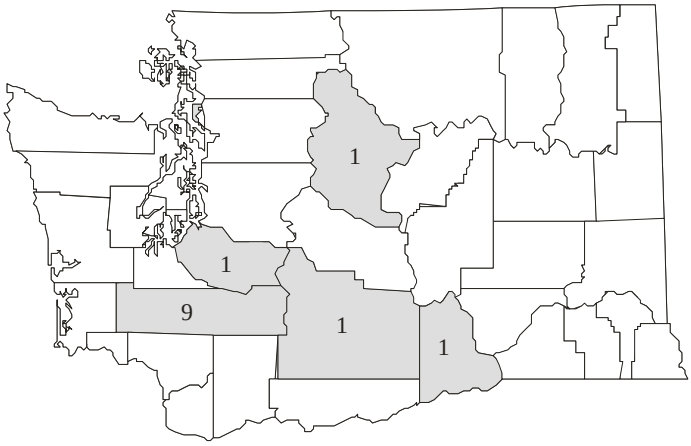
Public	0
Private	13
Total	13

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 2003, there were 13 landspreading sites identified statewide.

Location of Landspreading Disposal Sites



Public	0
Private	13
Total	13

Energy Recovery and Incineration Facilities

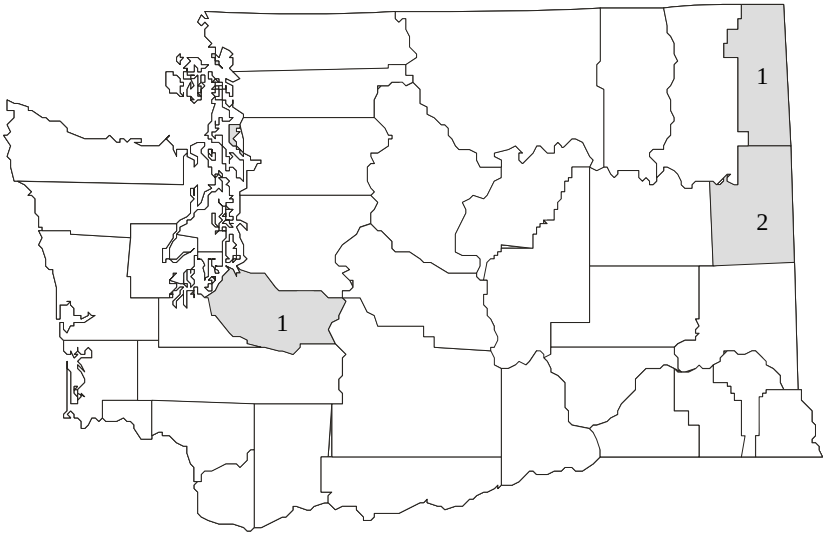
Energy recovery and incineration facilities that were designed to burn more than twelve tons of solid waste per day were permitted under the *MFS*. These facilities are now permitted under *WAC 173-350-240, Energy Recovery and Incineration Facilities*. The requirements are essential unchanged.

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 311,474 tons of waste incinerated in 2002. 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



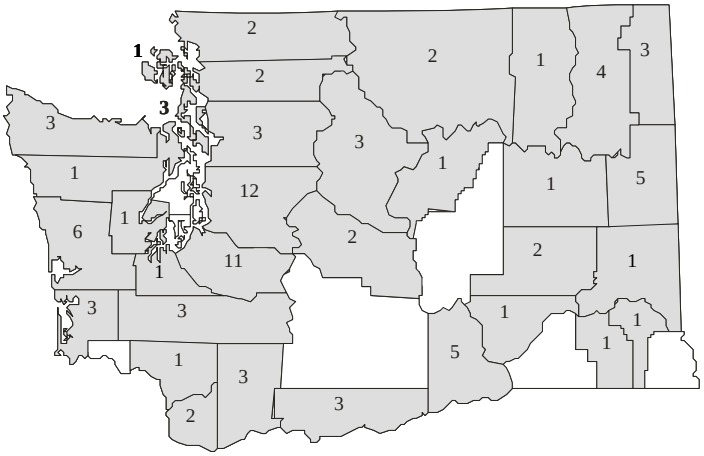
Public	2
Private	2
Total	4

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 2003, there were 94 transfer stations identified statewide, 63% being publicly owned.

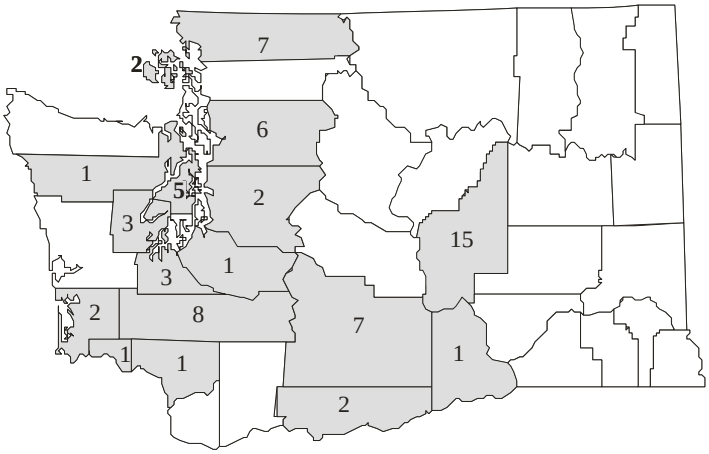
Location of Transfer Stations



Public	59
Private	35
Total	94

In 2003, there were 67 drop boxes identified statewide, 88% being publicly owned.

Location of Drop Boxes



Public	59
Private	8
Total	67

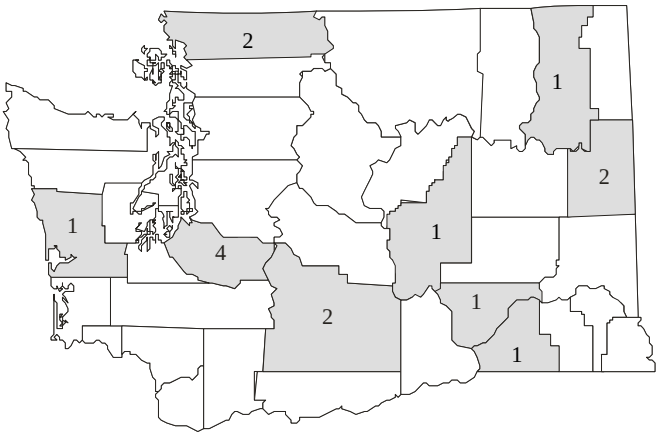
In 2003, there were no separately permitted baling stations identified statewide. There were three publicly owned compacting facilities identified.

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 2003, 15 regulated piles (not including composting or tires) were identified statewide. The majority, 87%, were privately owned.

Location of Piles



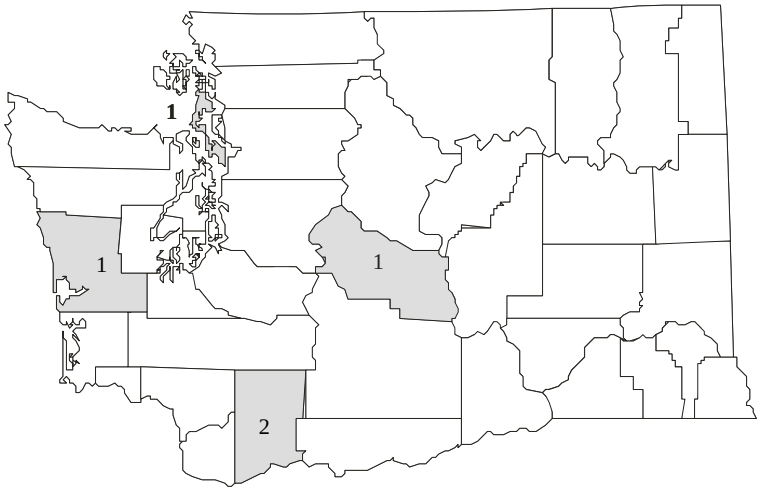
Public	2
Private	13
Total	15

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 2003, five surface impoundments were identified statewide, with 60% being privately owned.

Location of Surface Impoundments



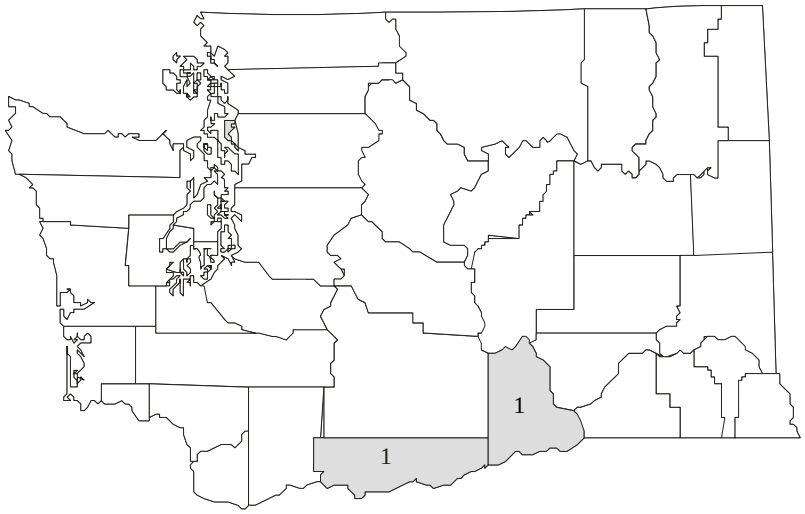
Public	2
Private	3
Total	5

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

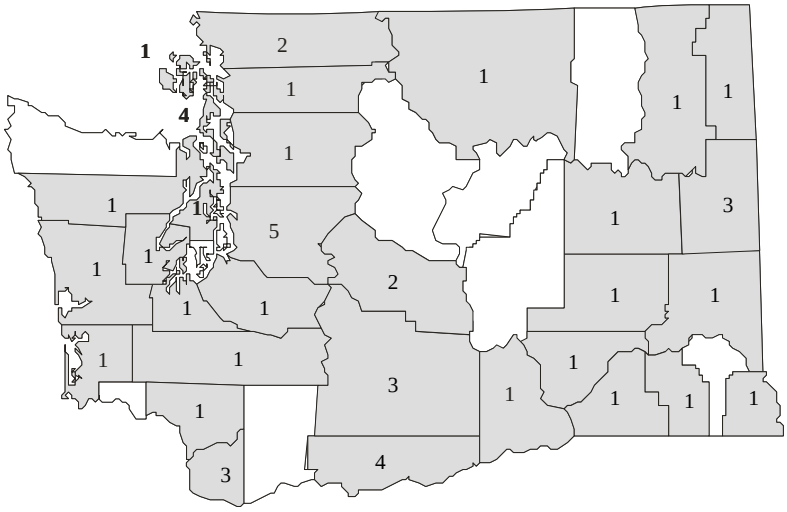
Moderate Risk Waste Handling

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 2003, 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 2002.

Location of MRW Sites



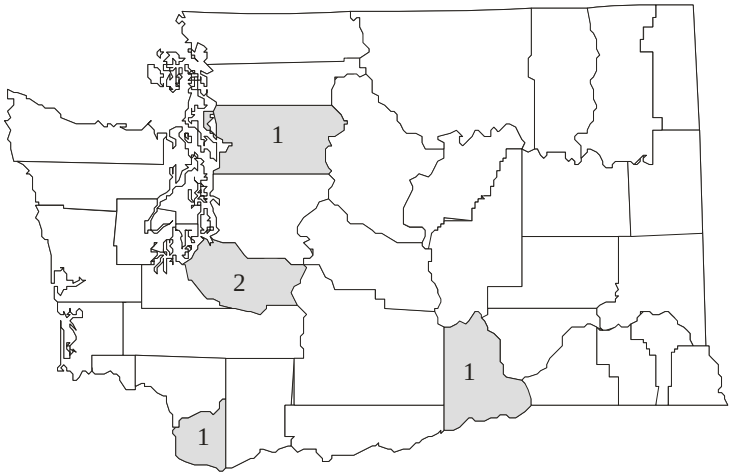
Public	43
Private	6
Total	49

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.

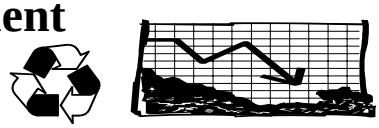
In 2003 there were five facilities identified under the *MFS* as "Other". They were all vactor waste decant stations. These facilities will either be subject to permitting under *WAC 173-350-320 Piles Use for Storage or Treatment* or *WAC 173-350-490 Other Methods of Solid Waste Handling* depending on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

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 (CSWM Plan). 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 CSWM Plan
Chelan	Yes - 1995	26% by 1995	1991, used oil amendment 1996	N	Beginning CSWM Plan update
Clallam	Yes – 2000	20% by 1996 40% long range goal	1991	N	Implementation. Will be revising heavily as switch from landfill to full service transfer station proceeds over the next three years. Updating MRW Plan.
Clark	Yes - 1994	50% WRR by 1995	2002	Y	Currently updating CSWM Plan
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	1991, used oil amendment 1994	Y	Update complete but not finalized as of 12/03
Ferry	Yes - 1993	35% WR/R by 1995 50% WR/R by 2013	1994	N	Preparing to update CSWM Plan
Franklin	Yes - 1994	35% R by 1995 5% WR by 1998	1993	N	Currently updating CSWM Plan
Garfield	Yes - 1993	26% WR/R by 1997	1992	N	Currently updating CSWM Plan, 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 plan approved December 7, 2000. The MRW plan was incorporated and updated in the 2000 CSWM Plan
Jefferson	Yes - 2000	Minimum 29% long range	1991 1999 Operations	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
			Guide		
King	Yes - 2002	50% residential by 2006 43% nonresidential by 2006	1997	N	Latest CSWM Plan 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 CSWM Plans, 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 CSWM Plans, 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 CSWM Plan includes an update to the 1990 MRW Management Plan. The text is fully integrated into the 2000 CSWM Plan.
Kittitas	Yes - 1999	50% by 2006 (in update)	1992, used oil amendment 1994	Y, in current draft	Update CSWM Plan in draft as of 12/03
Klickitat	Yes - 2000	50% diversion	2000	Y	Plan amendment finalized in 2001
Lewis	Yes - 1993	18% WRR by 1995	2000	Y	Currently updating CSWM Plan
Lincoln	Yes - 1992	35% WR/R by 1997	1992	N	Amended CSWM Plan 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 CSWM Plan, preliminary draft undergoing local review 9/24/03
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 CSWM Plan

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
Skagit	Yes - 1994	50% or better by 1995	1992	N	Currently updating the CSWM Plan with draft expected late 2002/early 2003.
Skamania	Yes - 1992	40% WRR by 1998 50% long range goal	2001	Y	Currently updating CSWM Plan
Snohomish	Yes - 2001	50% recycling goal to be reached approximately 2008	1993	Partially	Latest CSWM Plan 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 CSWM Plan 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 CSWM Plan. 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 CSWM Plan
Thurston	Yes - 2001	Increase recycling rate by 2.5% by 2005	1993	N	Update complete and approved 2001, waiting for City sign-off (issues)
Wahkiakum	Yes - 2003	20% WRR by 1996	2001	N	
Walla Walla	Yes - 1994	40% by 2002	1991	N	Currently updating CSWM Plan
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 CSWM Plan
Yakima	Yes - 1994	35% by 1995	1991	N	Currently updating CSWM Plan, working on final as of 12/03

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.

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.

The end of the year 2003 completed the second year of the two-year grant cycle which ran from January 1, 2002, through December 31, 2003. For this grant cycle, $17,419,902 was awarded to 103 different city, county, and public health jurisdictions. When the match dollars are included, the CPG grants leveraged over $23 million in solid and moderate risk waste projects. Final results of these grants will not be available until midyear 2004.

Program Redesign

While the grantees were utilizing their funds to accomplish their objectives in recycling, moderate risk waste collection and disposal, and solid waste enforcement, Ecology administrators were once again working to change the program. For the 2004-2005 cycle, the CPG program was redesigned in response to findings by the Joint Legislative Audit Review Committee (JLARC) by increasing strategic practices such as selecting projects for their likely results, structuring grant officer involvement towards technical assistance, and using project data to evaluate programs and improve future projects' efficiency and effectiveness.

After several meetings with a stakeholders group conducted in 2002, it was decided that the population-based method of setting allocations should continue unchanged, in order to develop successful solid waste programs statewide. Conversations with JLARC staff indicated this was acceptable provided Ecology had the ability to say "No" to poor investments and that statewide strategic goals were being met. In response, several methods were identified to ensure rigor in the selection process, strengthening project proposals so that all projects can be good investments. As a result, program operating methods in the 2004-2005 will be a combination of JLARC recommendations and past program practices. "Summit" meetings with state and local governments will help coordinate statewide priorities, and performance measures will track our progress.

Project Selection

Guidelines for the 2004-2005 grant cycle were written in early 2003. Applications for the 2004-2005 grant cycle were submitted by September 30, 2003. Slightly less money, approximately $17 million, will be awarded for grants beginning January 1, 2004, with a legislative request for an additional $1 million.

In reviewing 2004-2005 CPG applications, grant officers examined applications for:

1. Identified environmental and health benefits.
2. Identified measurement method (what will be measured and how).
3. Appropriateness of method/technology (applications identify the methodology and rationale for use).
4. Cost effectiveness compared to similar projects in similar jurisdictions (using performance benchmarks).
5. Readiness to proceed.
6. Minimum threshold score, defined so that each project is the best it possibly can be using the available time and resources.
7. Consistency with local comprehensive solid waste and hazardous waste management plans, ensuring that all projects address identified strategic priorities.

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, 2001, through June 30, 2003, grant period, Ecology initially offered 27 groups/organizations Public Participation Grants. One grant recipient declined the grant offer due to changes in their organizational focus and another declined due to lack of someone to take leadership of the project. This left 25 entities accepting the grant offers for a total of $903,000 for the biennium. These funds provided sixteen (16) grants for cleanup of hazardous waste sites and nine (9) grants for carrying out solid/hazardous waste pollution prevention education management priorities. Mid-biennium (FY03) one additional grant was offered and accepted. In addition, funds became available and offered in the form of amendments to recipients with active grant projects. The amendments totaled $226,765.

For the ensuing biennium, July 1, 2003, through June 30, 2005, grant period, thirty-one grant offers were initially made.

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 2001-2003 biennium provided support to projects that were moving toward sustainability in their community or a specific business/industry.

Toxics Reduction Initiatives

- Puget Soundkeeper Alliance – Initiate and facilitate meetings with Jefferson, Skagit, Island and Clallam counties with the EnviroStars Cooperative to identify needs and/or limitations to participating in the Cooperative's autobody shop waste audits. Also to implement the last phase (year 3) of the pilot project with Puget Sound Clean Air Agency (PSCAA) and Autobody Crafters Association (ACA) to reduce the cost of the air permit to autobody shops that have attained the four- or five-star level.

- Washington Toxics Coalition – Provide up-to-date health care information on how to protect the residents of the state and their environment. Their focus is to persuade and enable the residents to use safe or less toxic indoor and outdoor home care products in order to reduce toxic exposures to salmon, wildlife and humans.

Sustainability and Public Education

- Community Services Work Group – Coordinated education/outreach events on waste prevention and energy conservation for Earth Day.

- Lake Roosevelt Forum – Create an arena where diverse interests can come to express their concerns and ideas and build a dialog based on trust and respect for each others' interests and needs. Through this diverse group, common ways to protect and/or preserve the quality of the environment Lake Roosevelt will be developed.

Business Redesign

- Automotive Recyclers of Washington – Seminars to be held on Best Management Practices for hazardous waste and stormwater management for auto wrecking yard site cleanup**;** also to educate auto recyclers about new regulatory changes and proposed changes including the Mercury Recycling Plan due in December of 2002.

- Washington State Recycling Association – Plan and hold statewide commercial recycling roundtables. The focus is to bring local community businesses and commercial waste haulers and/or recyclers together to discuss opportunities to initiate or increase commercial recycling.

Past Grants Supporting Sustainability

In the past, Public Participation Grants have supported 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

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

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

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

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 2003, 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 worked in a team with General Administration (GA), several local governments, industry association representatives, and private sector partners to develop a construction waste management guide that was ready for publication in fall 2003.

Staff work with regional partners in making the Cascadia Chapter, which encompasses the Pacific Northwest, the leading regional chapter of the U.S. Green Building 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.

At Ecology's regional offices, sustainable building efforts continued in 2003.

"We don't make housing, we just make it greener." SW&FAP staff led a team that set design criteria for Spokane's first sustainable low-income multifamily housing projects. Thanks to the efforts of Ecology field staff and many, many community partners, Riverwalk Point now houses 52 low-income families in row house units that are healthy,

economical to operate, and attractive. They also feature amenities, such as decks made of Trex recycled plastic lumber, motion sensor lights in occasional-use rooms, and wall systems using recycled Styrofoam between sheets of oriented strand board, that are not typical of low-income housing, all at a smaller than typical ecological impact.

Ecology assisted the Spokane County Conservation District and the Northwest EcoBuilding Guild with an urban strawbale spec house project to demonstrate that it is possible to design a standard 3-bedroom, two-bath, attached-garage home and put it on an urban lot for the same price as a comparable stick-built home, using a conventional building contractor. The pictured house is one of two strawbale houses built on neighboring lots and sold for approximately $138,000 each.

On the educational front, the Sustainable Design and Construction Seminars course entered its third year at Washington State University-Spokane, where enrollment has nearly tripled since 2001. To date, more than 35 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 thanks to the efforts of SW&FAP staff.

In late 2003, regional staff formed a new partnership with a community college district, a union apprenticeship trades council, and a community advocacy group to begin development of sustainable building training. This training is being targeted at the skilled craftsmen and laborers who are essential to any successful construction of green building systems. The team expects to debut their first training in January 2004.

Ecology's SW&FAP emerged in 2003 as a major player in sustainable design and construction. 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.

Technical Resources for Engineering Efficiency

Technical Resources for Engineering Efficiency (TREE) is a multidisciplinary Ecology team with 12 members from the Hazardous Waste & Toxics Reduction, Water Quality, Water Resources, Spills, Toxics Cleanup, and Solid Waste and Financial Assistance programs. The TREE team provides free, nonregulatory, and nonbinding technical assistance for small to midsize private businesses. The TREE team typically works with a company for three to six months and prepares a final report recommending waste reduction opportunities. Follow-up phone calls and an evaluation are completed for each facility to assess the number of process changes and the effectiveness of our interaction with the company.

In 2002, TREE worked with four companies in Washington, Encompass, Del Monte, Independent Foods and Saint Gobain Crystals & Detectors. The team made suggestions that could annually reduce water use by 22.6 million gallons, hazardous waste generation by 38,700 pounds, and solid waste generation by 116 tons. By using the information supplied by Ecology's TREE team, these companies can potentially save $214,100 each year.

While the majority of companies that TREE worked with did not initially see improved management of their solid waste stream as a priority, they did consider implementing the final waste reduction recommendations once the cost and potential savings were documented. Because of the team's multidisciplinary design, the technical assistance provided often expands the business's field of view beyond its initial environmental concern. While the majority of TREE waste audits have focused on the end-of-life disposal, there are opportunities to work with a business's supply chain to reduce packaging and the toxicity of inputs into the manufacturing process. In fact, this technique might be more effective in reducing solid waste in areas where the cost of disposal is inexpensive and recycling is inefficient. TREE would also like to expand its expertise into energy conservation in the future, as this can be a significant cost to a business.

If you know of a facility that could significantly benefit from engineering analysis and waste audits, please contact James DeMay at 360-407-6338 or visit the TREE webpage at http://www.ecy.wa.gov/programs/hwtr/TREE/index.html.

2003 Northwest Hazardous Waste Conference

The annual Northwest Hazardous Waste Conference for Households and Small Business Programs took place in June 2003 in Pasco, Washington. The conference is planned by a group of local and state government and industry representatives from Oregon,

Washington and Idaho, who work with what we in Washington call Moderate Risk Waste (MRW). Conference attendees include professionals from Washington, Oregon, Montana, British Columbia, Idaho and others areas.

The 2003 conference included technical sessions and workshops organized around three main topic tracks:

1) Planning, Evaluation, and Legislation
2) Facility Operations and Waste Streams
3) Prevention, Behavior Change, and Product Stewardship

The conference provides an opportunity for participants to receive training, interact with vendors, network with one another, provide input on the Beyond Waste Plan, and learn about new waste streams, methods, and technologies. The 2004 conference is currently being planned and will take place in Troutdale, Oregon, in April.

Sharing Information about Food Waste Composting

According to the U.S. EPA, only 2.6% of 25.9 million tons of food waste was recovered for recycling in 2000. Nationwide, food waste makes up 11.2% of total municipal solid waste generated.[6] A 2003 composition study showed the MSW stream in Washington state contained 15.5% of food waste (of a total 5.54 million tons).[7]

The statistics show that food waste is a horizon in recycling that has not been addressed widely by state and local programs. Obvious barriers exist to food waste composting, but there are many creative and exciting solutions to these issues.

On August 13, 2003, at the Tacoma Nature Center this year's Westside Recycling Coordinators' Meeting brought together people who are designing and implementing programs that divert food waste for beneficial use. The meeting drew fifty-two attendees from city, county, and state governments, and the private sector. The peer presentations covered Seattle's study of anaerobic digestion of food waste, Portland's efforts to diagram and plan for food waste collection, King County's pilot residential food waste program, Seattle and King County's business collection and on-site composting, Seattle University's on-site food waste program, rural food waste composting at the Ark Restaurant, the state's upcoming Beyond Waste Plan and the requirements of the new chapter173-350 WAC, *Solid Waste Handling Standards*.

(For more information on any of these programs, please contact Ecology staff Emma Johnson (425) 649-7266 or ejoh461@ecy.wa.gov, or Shelly McClure (360) 407-6398 or smcc461@ecy.wa.gov.)

[6] Municipal Solid Waste in US, 2000 Facts and Figures, Executive Summary.
[7] Waste Composition Study for the State of Washington, Interim Final Report, 2003

Medical Industry Roundtable

The medical community's primary mission is to care for illness and improve human health. Over recent decades, the science and technology provided by our health care system has extended our lives and provided important treatments in our society. Along with all the benefits, there are many materials used by hospitals which can harm humans and our environment. Due to the expansion of medical facilities and a growing (and aging) population, the volume of these materials has become quite significant.

The Beyond Waste State Plan is considering hospitals as a potential sector to work with as we try to reduce solid waste and hazardous waste generation. Some impacts of hospitals are:

- Health care facilities across the U.S. generate 6,600 tons of waste per day. This amount is at least 15% higher than 8 years previous (1992 data) due to increased use of disposable products. (This figure does not include the contributions of private medical and dental clinics, veterinarians, long-term care, laboratories, and freestanding blood banks.)

- Medical waste containing chlorinated materials such as PVC plastic, when incinerated, is the third largest contributor of dioxins. Dioxins are potent carcinogens and cause hormonal defects in both animals and humans. Dioxins are so toxic that the maximum contaminant level recommended by the Environmental Protection Agency for drinking water is in picograms per kilogram. That is one hundred thousand times smaller than the contaminant level for mercury.

- Solid waste comprises the largest portion of a health care facility's waste, about 70 to 80%. This waste stream is composed primarily of paper, metal, glass, and plastics.

- About half of a health care facility's solid waste stream is paper and cardboard (45%).

- Health care institutions that have engaged in full-fledged waste reduction efforts have realized disposal cost savings of 40 to 70%.

- Experts estimate that medical and municipal waste incinerators are responsible for 30% of the total mercury emissions to air.

- Polyvinyl Chloride (PVC) plastic is thought to be responsible for 45% of total dioxin emissions from the health care industry and 27% of all plastics used in durable and disposable medical devices.

- Some flexible PVC medical devices can contain up to 50% Diethylhexyl phthlate (DEHP), a manufactured chemical that is commonly added to PVC to make it flexible. In various laboratory studies on animals, DEHP has been proven to cause a wide range of toxic effects including damage to the kidneys, liver, reproductive systems, lungs, heart, and developing fetus. Since DEHP is not chemically bonded to the vinyl product, small quantities may leach out in I.V. bags or medical tubing.

In order to educate and provide practical solutions to health care professionals and institutions, the Medical Industry Waste Prevention Roundtable, or MIRT, was formed in 1999 by King County. MIRT's mission is to bring together medical and life science industry professionals—and those that serve the industry—to explore cost-effective, environmentally sound solutions to environmental management challenges.

The MIRT steering committee consists of representatives from the Resource Venture, Chubb Group of Insurance Companies, Fred Hutchinson Cancer Research Center, Health Care and Waste Management Consultant, Interpretive Consultations, Inc., Local Hazardous Waste Management Program and Solid Waste Program in King County, MulitCare Health System, Pacific NW Pollution Prevention Resource Center, Swedish Medical Center, U.S. Environmental Protection Agency Region 10, Washington Department of Ecology, and Washington State Hospital Association. This group regularly convenes to discuss planning and networking opportunities.

In addition, MIRT provides three to four environmental management seminars a year in the Puget Sound region on topics such as mercury reduction, waste management, pharmaceutical disposal, green building, and tracking progress. These seminars give participants from the medical community an opportunity to access peer-tested technologies and techniques, information on recent regulatory changes, and structured networking opportunities. MIRT seminars have grown steadily in attendance due to the content and structure of the seminars, attracting 50 to 60 people from hospitals, biotech facilities, and dental clinics at each seminar. MIRT seminars updates and other resources are located at www.nwmedicalwaste.org.

MIRT is also a *Hospitals for a Healthy Environment* (H2E) Champion, encouraging hospitals to greatly reduce their solid waste and virtually eliminate mercury from their facilities.

H2E Hospital Partners commit to work towards the elimination of mercury from the waste stream by 2005; reduce waste generated by the facility and help meet the H2E total waste volume reduction of 50 percent by 2010; minimize persistent, bioaccumulative, and toxic chemicals; implement programs and policies that will protect the environment,

improve worker safety, reduce pollution, and advance community health; and assess their facility's waste and environmental programs and set annual goals and action plans.

The Pollution Prevention Resource Center in Washington, Idaho Department of Environmental Quality, and Alaska Community Action on Toxics are working closely with the Oregon Center for Environmental Health to jointly sign up 10 to 15 new partners in EPA Region 10. For more information on H2E, visit www.h2e-online.org. These groups, along with Ecology, Oregon Department of Environmental Quality, and other nonprofits, recently met to discuss creating a regional work group to reduce the impacts of medical facilities.

Partnering for the Environment by Beneficial Use of Materials

Composting

Composting continues to be a key element of the state's strategy of creating a closed-loop system for recycling organic materials. Thirty-four compost facilities reported actively recycling organic material in Washington in 2002. 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 which are exempt from solid waste permit requirements. The exemption categories were designed to "promote composting while protecting human health and the environment." SW&FAP has worked collaboratively with Washington State University Cooperative Extension researchers, consultants, and local governments to educate potential composters about the

new opportunities and the responsibility to use best practices when composting even small volumes of material.

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

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 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.

Technical Assistance with Chelan County Composting

During the spring of 2003, Chelan County initiated composting at the Dryden transfer station after several years of planning, permitting, and construction. This facility received funding through a Coordinated Prevention Grant. Objectives for this facility include the recycling of organic materials that would otherwise be funneled through the transfer station to the Greater Wenatchee Regional Landfill. In addition, this facility is to provide a beneficial use alternative for biosolids from the city of Leavenworth.

Ecology has provided technical assistance to the county with regard to operational considerations, development of compost recipes, monitoring for regulatory compliance, and analysis and stability evaluations of the final product. Chelan County will be updating its solid waste management plan. Ecology has provided input regarding how this very positive initial step in organics recycling can play a role in developing a larger system capable of supporting a more inclusive organics cycle within the county and beyond.

(Further information may be obtained by contacting Peter Severtson (509) 575-2605 or pser461@ecy.wa.gov.)

Land Application of Waste Apples

During the last several years, thousands of tons of waste apples have been generated annually in eastern Washington. The cause has been poor market conditions combined with cull fruit generated during the packing process. Much of this volume of nonmarketable fruit has been discarded in landfills or illegally dumped at high concentrations in areas throughout Chelan and Douglas counties and other apple growing regions of central Washington.

In a collaborative effort between Ecology and the Chelan-Douglas Health District, an experiment was designed to test land application of waste fruit on dry-land wheat fields near Waterville, Washington, with the intent of investigating the effects on soil characteristics. Waste apples were land applied at two different rates, with control plots established as a baseline for comparison. Treatment and control plot soils were tested before and after application of fruit for cation exchange capacity (CEC), ammonia N (NH_3) and nitrate (NO_3), total volatile solids, pH, and water holding capacity. Ultimately, the desire was to draw inferences about the effects on soil and small grain production as well as the potential for groundwater contamination from nutrients at illegal dump sites.

The experiment showed little difference between plots that received fruit and the control plots. There were some visual differences in weed germination between plots the following spring (reduced germination in treated plots) and a very minor increase in levels of plant-available nitrogen in the treated plots; however, tested parameters were statistically similar across both treated and untreated plots. Therefore, low- and moderate-rate land application of waste fruit appears to have little, if any, substantive effect on soil characteristics and nutrient loading.

Land application of waste apples is a lower-cost option than landfill disposal (given the hauling distance used in this study). In theory, this could translate into an incentive for generators to recycle waste fruit through land application processes. Costs would be reduced further if agricultural sites close to the packing sheds were used. However, the practical difficulties of managing such a recycling program may preclude the generators from exercising this option. Nevertheless, the research did provide good evidence that

the threat of soil contamination, excessive nutrient loading, or water quality degradation due to leachate is low. This information should aid the Health District in determining the relative risk associated with apple waste disposal problems.

As a footnote to the experiment, anecdotal soil tests were conducted in the fall of 2003 on an illegal dump site where the estimated volume of waste fruit exceeded 800 tons per acre. Tests indicated that nutrients (N, P, and K) were statistically higher in soils beneath piles of waste fruit than soils adjacent to the dump site. However, unless these higher nutrient levels were combined with a high potential for erosion (e.g. fruit dumped in gullies or draws) the chance for offsite nutrient transport appears low.

(Further information may be obtained by contacting Peter Severtson, (509) 575-2605 or pser461@ecy.wa.gov)

Biosolids

In the spring of 1998, Ecology issued a new rule, chapter 173-308 WAC, *Biosolids Management*, and a new statewide *General Permit for Biosolids Management*. In the past five years staff have been focusing on three workload areas:

- State program delegation to local health departments
- Permit program implementation
- Technical assistance

Local Delegation

By late 2002, eleven health jurisdictions had accepted some degree of delegation and were actively partnering with Ecology towards implementation of the state biosolids program. Other health jurisdictions are also working with Ecology but have not authorized a formal delegation arrangement. This remained the case for 2003. Local funding and workload issues have been barriers to delegation. An unanticipated barrier has been continued concern regarding implementation of the septage management portion of the state program. Convening in the summer of 2002 and continuing into the spring of 2003, Ecology worked with an advisory committee to evaluate the current septage management elements of the state biosolids program, and to make recommendations for improvements. We continue to hope that resolution of those concerns may encourage further delegation at the local level. At the same time, budgets continue to tighten and are expected to be an ongoing barrier to delegation efforts.

Permit Program

Ecology estimates there are about 375 Treatment Works Treating Domestic Sewage (TWTDS) statewide (these are the facilities which are subject to permitting under the state biosolids program). This number includes federal and state facilities, as well as Beneficial Use Facilities, composting facilities, and some septage management facilities. Most TWTDS, however, are publicly owned treatment works (municipal sewage

treatment plants). All facilities are obligated to comply with any applicable requirements of the state rule, *regardless of their status under the permit system.*

Treatment works come under the biosolids permit system in two phases. The first phase, called "provisional approval," obligates a facility to comply with all applicable requirements of the statewide general permit. The second phase, final approval, is the process whereby facility specific requirements beyond those required under the rule or basic general permit are developed and put in place. This process is necessarily slower due to the complexity of reviewing individual permit applications with limited staff resources.

Virtually all facilities are under provisional approval, and seventy approvals of coverage under the statewide permit have been granted as of October 2003. Permitting of septage land application sites and beneficial use facilities has consumed a disproportionate amount of staff time. Resolution of difficulties encountered in permitting these types of facilities would speed the overall permit issuance process.

Septage Management

The 2002 Legislature approved a supplemental budget request to pursue an assessment and potential revisions to the current septage management elements of the state biosolids program. A fifteen-person advisory committee met eight times from 2002 to 2003. The committee developed and agreed upon a broad goal to provide reliable long-term systems for the management of septage that protect public health and the environment and are economically feasible and publicly acceptable. To achieve that goal, eight specific objectives and a set of evaluation criteria were developed. These formed a framework to discuss and develop a consensus regarding specific strategies that should be employed to meet the goal. The Septage Management Strategic Plan (Publication #03-07-018) was published in May of 2003 and is available on the Ecology Web site at http://www.ecy.wa.gov/pubs/0307018.pdf .

The primary barrier to the reform of septage management in Washington is a lack of consensus on an appropriate funding mechanism. Less than five percent of Ecology's permit fee revenue is currently derived from septage management, and significantly disproportionate shares of resources are directed toward septage management activities. The primary fee payers, publicly owned treatment facilities, have been patient and accommodating while the agency works through the septage management dilemma, but they have expressed concern that service to them is reduced because resources are diverted to septage management issues. The agency concurs.

The Septage Management Advisory Committee recommended funding the state program and providing funding assistance to local health jurisdictions by assessing owners of septic tanks each time they are pumped. The service provider would collect and periodically submit the fees to Ecology. Subsequent to that recommendation, further discussions led to a recommendation to collect the fee from the point where the septage was discharged (a treatment works, a land application site, a compost facility). The

advantage to this approach was a significant reduction in resources needed to administer fee collection. Some local environmental health jurisdictions did not support either approach and there is no consensus with that important partner. A third approach, not necessarily preferred by local health jurisdictions but advanced by some, is to collect fees from the land application sites only. The department cannot support that option as we presently understand it because fees to individual land application sites would be prohibitively high in addition to other problems. The department will continue to work on resolution of this issue. It is a relative certainty, however, that the agency must either increase revenue to support the septage program, or decrease the program workload.

Partnering for the Environment by Focusing on Specific Problem Waste Streams

MRW Initiative

Moderate risk waste (MRW) is one of the five initiatives chosen as focus areas for the Beyond Waste Project. MRW was added to a list of four initiatives recommended by a consultant due to feedback from Ecology staff and local governments about the significance of this waste stream.

A group of MRW professionals from Ecology's Solid Waste and Financial Assistance Program (SW&FAP) and Hazardous Waste and Toxics Reduction Program (HWTR) partnered with local government MRW experts to develop an Action Plan for MRW. This group has been working since April 2003 to develop this initiative. The Action Plan has gone through several iterations, including two stakeholder review processes. Lists of outcomes and action items for the initiative were reviewed at the annual Northwest Hazardous Waste Conference, which is attended by state and local governments and some private industry. The Action Plan was also reviewed by staff of the SW&FAP during an all-staff meeting. Comments from both groups continue to be incorporated into the Action Plan.

The draft version of the Action Plan currently includes goals (outcomes), objectives, a list of priority areas of concern, and a section on implementing the Action Plan. This document will go through an additional review process to gather input from local government and other stakeholders. The intent of the MRW Initiative workgroup is to develop a plan that will be useful to local government and to Ecology staff who are working on MRW issues in the state. Because of the nature of MRW, this must be done collaboratively between Ecology programs, local government programs, individual citizen efforts, and the private sector stakeholders.

Scrap Tires

Washington state has been working to address our continuing scrap tire problem. Spurring these efforts was the passage of Substitute House Bill 2308 (SHB 2308) in 2002. One section of the act created by this bill directed Ecology to investigate the scrap tire problem and submit a report to the Legislature by December 31, 2002. The following text was adapted from "SHB 2308: Scrap Tire Report" published in December 2002. The full Scrap Tire Report is available on-line at http://www.ecy.wa.gov/biblio/0207029.html.

Summary of the Scrap Tire Report Prepared Pursuant to SHB 2308

Effective scrap tire management in Washington has waned since pioneering efforts were implemented in the late-1980s. Since the sunset of the scrap tire program in the mid-1990s, there has been little progress made in cleaning up remaining tire piles. Tire piles present fire and public health hazards. Other states have improved on early tire management programs, such as the one originally implemented in Washington, by supporting product markets.

Most states and provinces have active scrap tire programs, typically funded through a fee of $1 per tire to support tire cleanup, enforcement, and market support. Effective state-run scrap tire programs have the following features, based on the research and experience of the Rubber Manufacturers Association (RMA):

- Funding source for grants/loans for projects and equipment.
- Focus on research, development, and demonstration projects.
- Diversified markets approach.
- Emphasis on in-state end-uses.
- Fee deposited into a dedicated tire fund.
- Strong regulations and enforcement on tire dumping.
- Amnesty days and abatement to remove tires.
- Creation of a level playing field for tire products, allowing the market to work.

The original Washington scrap tire program included these features:

- A funding source for projects.
- A dedicated fund.
- Tire removal.
- Some minor emphasis on research and demonstration projects.

So, at best, Washington's original program included only half of the eight critical program features now thought to be required for a successful state scrap tire program. Enhancing and supporting scrap tire markets is a key part of the integrated management system described above. Substitute House Bill 2308 (SHB 2308) recognized this fact in requiring the tire report to include:

> *"The feasibility of establishing and maintaining an incentive program for market development for scrap tires. This shall include, but not be limited to, the results of research into the availability of funding for such a program and proposed criteria for the program that favors projects utilizing higher end value uses of scrap tires."*

In fulfilling the reporting requirements of the SHB 2308, Ecology performed research that reached to other states and various scrap tire industry contacts in North America. In addition, the recommendations from a legislative scrap tire task force in Oregon were examined.

SHB 2308's focus on high end-value markets points toward encouraging markets for crumb rubber from scrap tires. Nationally, this is a growing market, but in the Northwest there are missing pieces of the market, specifically crumb rubber used in road construction and other civil engineering projects. Fortunately, there is a lot of research which can be used to address the cost and technical issues surrounding the support of this market in Washington.

Table 3.2 summarizes the program elements Rubber Manufactures Association (RMA) considers to be most important for a state scrap tire program to be successful. Shown in the last three columns of the table are the comparable program element in Washington, the state law related to each element, and what our state's relevant needs may be.

Table 3.2
Ideal Scrap Tire Program Elements

Program Element	Exists in WA	RCW citation	Needs
1) Funding source for grants/loans.	No, Vehicle Tire Recycling Account Fee sunset in 1994.	70.95.510-535	Re-establish or otherwise fund at an appropriate level.
2) Program focuses on scrap tire research, market development, and demonstration projects.	Demonstration projects at local level only.	70.95.535(2)(a)	Expand to state-level agencies.
3) Diversified markets approach.	Yes.	70.95.535	Include DOT and DCTED.
4) Emphasis on in-state end-uses.	Not explicitly.	None	Prioritize promotion of end-use, in state.
5) Fee deposited into a dedicated tire fund.	No, Vehicle Tire Recycling Account Fee sunset in 1994.	70.95.510-535	If re-established, create a variable fee. See note 1.
6) Create strong regulations and enforcement on tire dumping.	No, enforcement is locally specific. No tracking of tires, limited bond for $10,000 per storage site is inadequate. See note 3.	70.95.500, 70.95.555, 70.95.560, and 70.95.565	Statewide tracking, uniform strong statewide enforcement, and significant financial assurance.
7) Amnesty days and abatement to remove tires.	Yes for abatement, no statewide amnesty days.	70.95.530	Amnesty tire public turn ins.
8) Create level playing field for tire products, allow the market to work.	No, illegal tire dumping and whole tire disposal competes directly with recyclers.	None.	See item 6 in this table.
9) A user fee is assessed (most efficiently at the point of vehicle registration).	No, fee was on a new vehicle tire basis.	70.95.510	Consider optional funding bases.
10) Funds are used to stimulate end-user markets. See note 2.	Not specific, law generally encourages recycling.	70.95.020(6)	Prioritize stimulation of end-user markets.

Notes:
1) The fee is reduced when stockpiled tires have been eradicated and when ample and sustainable markets exist for future-generated scrap tires. A nominal fee may be needed to maintain continued enforcement and oversight.
2) Contracts are awarded to those who exhibit economical and environmentally sound end-use markets
3) The new solid waste rule 173-350 WAC strengthens the financial assurance requirements for tire storage.

The table above illustrates where existing Washington law provides, partially provides, or lacks, what is needed to create a viable scrap tire program that actively supports proper management of scrap tires from generation to end-use or disposal. A viable scrap tire program must also provide the required enforcement and marketing incentives for reuse and recycling markets. To establish and maintain a comprehensive scrap tire management system in Washington, legislative and agency action would be required. An example of how Illinois chose to address most of these issues is contained in the text of Appendix E

in the Scrap Tire Report. Illinois is especially strong in its market-support provisions. An example of a comprehensive scrap tire enforcement and tracking system is from Missouri. The Missouri scrap tire enforcement program is described in "Scrap Tire Generation, Use, and Enforcement," Section 3.0 of the Scrap Tire Report.

A comprehensive scrap tire management system would require legislation to re-establish a fee for the Vehicle Tire Recycling Account (VTRA) to support the following:

1. Expand scrap tire demonstration projects to include state agencies.

2. Strengthen existing provisions for market development for in-state diverse markets.

3. Strengthen the scrap tire tracking and enforcement provisions of existing law, including a per-tire-in-storage financial assurance instrument.

4. Support statewide illegal tire pile cleanup and citizen scrap tire amnesty events.

5. Prohibit whole-tire landfill disposal.

The fee could be based on a point-of-sale tire fee as before or other fee revenue sources. If the per-tire fee were re-established, it should be implemented as a variable fee. The need for a variable fee is based on anticipated changes over time in the performance of the management of scrap tires in Washington. As the management of tires improves, the fee would be reduced. A beginning fee of $1 per new vehicle tire could be re-established as in the original legislation.

The beginning fee would then be adjusted based on performance measures. Performance measures might include indexing to the percent of non-disposal tire recovery as well as an estimate of remaining tires in piles needing cleanup. As the level of tires in piles remaining to be cleaned up decreases and the level of tire recovery increases, the fee per tire would decrease to a support level of perhaps 25 cents per tire.

The support level would remain to provide funding for tracking, enforcement, ongoing public information and education, and administrative costs. The system tracking would be needed to monitor the ongoing performance of the scrap tire management system and trigger any required changes in the fee.

The frequency of change for a variable tire fee should be averaged over time. This will provide relative stability in the face of tire markets which can vary quickly, tire piles which are not always easy to locate, and frequent changes in fees which can be confusing to the public. A three- to five-year running average might be an appropriate time frame to consider changes in the fee structure.

The use of the fee would be best spilt between a number of state agencies for scrap tire enforcement, technical assistance, marketing, procurement, and research interests. Some

elements of such programs are contained in the body of this report, but the division of the variable fee, based on system performance, would need to be determined.

It would be very beneficial to leverage the expertise of the private sector and natural markets to the greatest extent possible. There is discussion in the report of opportunities and approaches to this collaboration including industry support for education and technical assistance. These industry stakeholders will be more likely to assist if a scrap tire program is re-established in Washington.

Most programs in the United States are run by state agencies. The option for an industry or industry/government-run scrap tire program is also discussed in the report and offers certain advantages and difficulties. This is often called a "product stewardship" approach. Although there are examples of product stewardship for other product types in the United States (such as Ni-Cd and other rechargeable batteries) and elsewhere (waste paint and other hazardous consumer waste products in British Columbia), it has not yet been attempted in the United States for scrap tires. This option could be explored further and could be instituted in various ways through legislation.

Finally, as directed by SHB 2308, Ecology investigated and reported on the use of scrap tires as a substitute for soil as alternative daily cover at landfills. Based on that analysis, Ecology will develop guidance to encourage this use of scrap tires in Washington.

See Chapter V The 2002 Recycling Summary for Washington for addition information on scrap tire generation, use and tracking

Electronic Waste

In recent years, electronics has emerged on the solid waste horizon as a large and complicated waste stream to manage. We discovered that not only was the waste stream bulky, it was toxic as well. Many local governments became concerned about the possibility of being solely responsible for the cost of collection, transport, and recycling of this material. In response, they have gathered significant information about volumes, established interim management programs, and are participating in creating a more financially and physically sustainable solution for electronic products. The following is a brief summary of activities to address the electronic waste stream.

New Awareness about Electronics Waste Stream

Through recent analysis and extrapolated data from local governments, it is estimated that households and small businesses in Washington generated 1.7 million obsolete computers, monitors, and televisions in 2002. If recycling and collecting these materials cost about $15 each, the cost to governments or citizens in 2002 would have been $25.5 million. In coming years, the number of obsolete units will most likely grow. Such increasing costs could easily obscure other solid waste obligations.

Continuing to landfill such material could become a significant environmental concern, as it has been proposed that potentially 40%-70% of the heavy metals in municipal solid waste landfills comes from electronics discards. (Summary of Washington State Electronic Waste Bill (HB 1942)) The nonprofit group Washington Citizens for Resource Conservation reports that more than 315 million computers nationally will become obsolete between 1997 and 2004. Since plastics make up over 13 pounds per computer on average, there will be more than 4 billion pounds of plastic present in this computer waste in a couple of years. Estimates are that computers discarded between 1997 and 2004 will contain 1.2 billion pounds of lead.

Eastern Washington

In December 2002, an Ecology study prepared by Cascadia Consulting entitled "Assessment of Electronic Waste Generation, Collection, and Processing in Eastern Washington" set out four goals. The first goal was to estimate current and projected electronic waste generation and stockpiling from households and small quantity generators. The results showed that Eastern Washington residents and businesses are currently storing 530,000 TVs, computers, and monitors, an amount weighing 10,000 tons. Annually, thousands of additional household units will become obsolete, with many of these coming from small quantity generators. The other goals of the report included researching current e-waste services and policies, creating a map showing possible locations of collection points, and assessing service level needs and the relationship to product stewardship efforts. The study is available at: http://www.ecy.wa.gov/sustainability/Resources/FINAL%20E-waste%20report.pdf

Douglas and Chelan Counties held a joint electronics collection event targeting small businesses in June of 2003. Each county sent out surveys in April to determine the amount of electronic waste in the area. Douglas County sent out 55 and had 14 returned. Chelan sent out 2000 and had 600 returned. Each county then sent out preregistration forms to small businesses in April of 2003 in order to know how much equipment they could expect. The preregistration worked well because there were not long lines and they came very close to their estimated collection totals, which was around 600 pieces of equipment. They collected approximately 634 pieces of equipment. The pieces included 267 CRTs, 2 TVs, 9 scanners, 66 printers, and 157 CPUs.

Kittitas County held an electronics collection event in June of 2003. To prepare for the event, the county sent out two hundred surveys and also called local businesses and had nineteen returned. The event was held on a Saturday morning from 9:00 a.m. to 1:00 p.m. and was open to the public and small quantity generators. Twenty-one computer monitors, fourteen CPU's, and three television monitors were collected. The county learned from this event that it is helpful to advertise more in the newspaper and on the radio, and they will personally contact the schools to let them know about the event. They will also advertise in their city and solid waste billings.

Both of these collection events charged comparable prices for recycling of electronic waste ($7-$17) and fully covered the cost of recycling the material.

Other Local Programs

There are a couple of noteworthy local programs which could also be used as models for an interim solution for managing electronic waste. They include:

Snohomish School/City Electronics Procurement Policy and Recycling Sustainability Pilot Project collected over 298,000 pounds (347 pallets, 149 tons) equaling 7,000+ units from 18 school districts and cities in the onetime collection service provided by the county. This was more than double the amount anticipated in the original proposal. The cost was $69,360. Extrapolating the costs on a per student basis statewide, the cost to clean out EXISTING stockpiles from Washington state public schools would be about $750,000.

One of the participants from the City of Lynnwood contacted the State Procurement Officer and requested that the state amend the contract for fluorescent tube recycling to include electronics. Agencies and school districts can now use the state's electronics recycling contract with Total Reclaim, easing their procedures considerably. Several school districts have already reported initiating or improving their donation screening procedures. Shortly after the pilot grant was completed, other Washington counties have begun to consider similar projects with school districts. (For any entity that can use state contracts, see State Contract No: 11601 **Spent Lighting, Computer and Electronic Equipment Collection, Reuse, Recycling and Disposal Services** available at: http://www.ga.wa.gov/servlet/PCAContractDetailSv?contnbr=11601,click on *Current Contract Information Document*.)

Snohomish County has also established the *Take it Back Network* to collect electronics. The Network encourages local shop owners, TV repair places, and some big box stores to become semi-permanent collection points for recycling certain electronic waste. The thought is that such a network has more efficiency than providing geographically limited collection events. Snohomish County provides the leadership, publicity, and technical assistance to retailers, nonprofits, and electronics repair and service shops, who then provide distribution of Network information, and where possible, also serve as electronics collection sites. Haulers and recyclers work to provide environmentally sound collection, transportation, and recycling options that will improve in cost and

convenience as the Network continues to develop. Snohomish County was recognized in 2003 at the Washington State Recycling Association for their innovative program.

In King County, the number of suburban cities collecting electronic materials has doubled (from 12 to 24 cities) since 2001. One of these cities, Kirkland, is planning on collecting electronic materials at the curb, starting in December 2003.

Beyond these few examples, other local jurisdictions view electronics disposal as an emerging difficulty for their solid waste system and are providing local solutions. Statewide, nine counties have partially sponsored electronics collection events or services. These counties are *Benton, Clark, Cowlitz, Douglas, Chelan, King, Kitsap, Kittitas, Pierce, Snohomish, and Thurston*.

Electronics Legislation

Part of the effort to create a more sustainable solution is through the Legislature. House Bill 1942 was introduced in Olympia in early 2003 but did not come up for a vote. It could be taken up again in the 2004 session. The bill, sponsored by Representative Mike Cooper, would ban landfilling and incineration of electronic waste, discourage export, and phase out toxics while making manufacturers bear end-of-life financial responsibility for their products.

In addition, electronics legislation was introduced in about 6 states in 2002 and passed in 2003 in California. To read other state's legislation, go to http://www.productstewardshipinstitute.org/pdf/StateElectronicsLegislationStatusChart.pdf .

June 2003 NEPSI Meeting

A broader solution is the establishment of a national product stewardship approach to electronic products. Such an approach would make it easier to recycle and return products to the manufacturers and would move beyond inefficient and costly collection programs at the local level. In June 2003, Snohomish County Solid Waste Management Division, King County, and the Department of Ecology co-hosted the National Electronics Product Stewardship Initiative meeting in Seattle. NEPSI consists of 45 participants, including representatives of 12 electronics companies, the Electronics Industry Alliance, 12 state and local governments, EPA, 5 recycling companies, 2 computer product retailers, and several nonprofit associations and advocacy groups. The goal of the meeting was to reach an agreement with stakeholders about how to manage electronic waste, a process that has taken almost two and a half years thus far. Most stakeholders at the full NEPSI meeting in Seattle agreed to proceed forward with a hybrid system to fund the collection and recycling of electronic equipment.

The funding plan, uses an advanced recycling fee, paid by the user, and shifts toward a "partial cost internalization fee," combining consumer and industry costs. Manufacturers

and other interested parties, however, have not yet agreed on the specifics of a funding mechanism, and the NEPSI group continues to meet to resolve the final agreement.

Following finalization of a funding outline by the end of this year, stakeholders may jointly propose federal legislation to Congress, which may supersede individual state legislation related to product stewardship or electronics management. For details, visit http://eerc.ra.utk.edu/clean/nepsi/.

Partnering for the Environment through Education and Information Sharing

Promoting Sustainability and Organics Recycling in a School Curriculum

The Solid Waste and Financial Assistance Program contributed funding and technical assistance last spring in support of an innovative project in Klickitat County. The project was a cooperative effort between Ecology, the Underwood Conservation District, Klickitat County Solid Waste, and the Lyle Middle School, designed to promote organics recycling through composting and to aid in developing a permaculture or sustainability based curriculum.

A portion of the funding was used to design and set up an aerated compost system. The students will manage the composting process, monitor the changes that occur over time, and investigate the microbial processes that drive the system. The compost is being used by the students to amend the soil for developing a community garden. The garden is to be a source of vegetables for the students (in a school that eliminated the hot lunch program for this year) and as a focal point of instruction and education outreach to the community.

"Teaching across the curriculum" is the mechanism by which a practical activity can be used in various ways to meet the state's educational standards. The Essential Academic Learning Requirements (EALR) are statewide standards that have been developed for basic subjects. Goals outlined in the Education Reform Act require that there is a link between thinking skills and the Learning Requirements, and that these in turn are linked to the world of work.

The Lyle Middle School will use the organics recycling project to develop this type of curriculum. Getting students to understand the world they live in, teaching principles of recycling and sustainability while meeting the EALR's, is the fundamental objective. Learning in science depends on actively doing science. Active engagement in hands-on science experiences enables students to make personal sense of the physical world and to solve problems. Students at the Lyle Middle School will not only be able to meet the goals of the Education Reform Act, but also support the goals of sustainability by helping to eliminate the concept of waste, promoting healthy natural systems, and moving Washington State toward sustainability.

(Further information may be obtained by contacting Peter Severtson, (509) 575-2605 or pser461@ecy.wa.gov)

Providing Information and Training for the New Solid Waste Handling Standards

One of the requirements of chapter 173-350 WAC, *Solid Waste Handling Standards*, is that each jurisdictional health department (JHD) must adopt local ordinances implementing this chapter no later than one year after the effective date. Local ordinances need to be at least as stringent as this chapter, but may include additional requirements (WAC 173-350-700). To support the implementation of the new rule, SW&FAP offered training to the JHDs on both the east and west sides (Moses Lake and Tacoma) within a month of passage of the rule. The workshops were set for a day and a half each, and were supported by staff experts who were active in the development of the rule. The trainings were attended by approximately 120 people representing all but three of the JHDs.

A second set of workshops were held in June 2003, again with a workshop on both the east and west sides of the state. These workshops were aimed at both public and private facility operators, consultants and other solid waste professionals. Approximately 130 people attended the two workshops. The program has continued to provide training on an ongoing basis to professional organizations at conferences and other meetings including presentations at local solid waste advisory committee meetings.

Ecology also provides information about the requirements of the new standards at http://www.ecy.wa.gov/programs/swfa/facilities/350.html. Ongoing technical assistance will be provided to the local jurisdictional health departments and facilities as the rule is implemented.

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.

Beginning in 2002, Ecology began a process to review the home study approach for landfill operator certification. The review consisted of examining existing records and information, soliciting input from Solid Waste Association of North America (SWANA), the national organization and the Washington chapter, discussions with inspectors and operators, and a cost-benefit analysis of the options considered. Ecology decided to reinstitute the training course. Ecology has begun negotiations with SWANA for SWANA to conduct the training, testing, and program administration. A memorandum of understanding is currently being negotiated between SWANA and Ecology; however, no agreement has been formalized at this time. The revised system would allow for increases in the frequency and breadth of in-state certification, recertification, and training options for managers, operators and inspectors of landfills in Washington.

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.

In 2003, 39 certifications were up for renewal (25 landfill, and 14 incinerator). Notices were sent off in September. Recertification requests must be submitted to Ecology by year's end.

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.

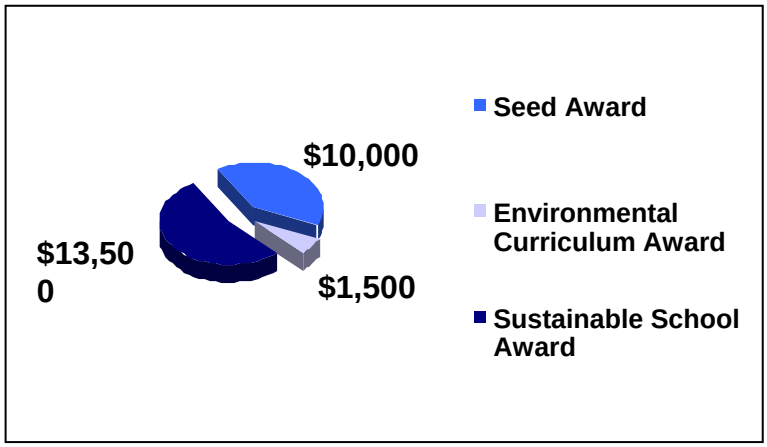
Recognizing Waste Reduction and Recycling Efforts - Terry Husseman Sustainable Schools Awards

On May 15, 2003, at St. Martin's Worthington Center, Ecology Solid Waste and Financial Assistance Program Manager Cullen Stephenson presented $20,000 in cash awards to 14 schools from across the state in a ceremony that celebrated their exceptional environmental sustainability efforts during the 2002-2003 school year. Over 40 schoolchildren attended the ceremony.

Two years ago, Ecology decided to refocus the Terry Husseman School Awards so that they supported our state's Beyond Waste vision and sustainability priorities. The purpose of the new awards program is to help schools establish sustainability programs and to provide incentives for improving existing programs.

This Award Program is open to all Washington state kindergarten through 12th grade public schools. It recognizes schools for their successes managing materials and wastes in a sustainable fashion and honors schools and/or teachers for developing innovative curriculum or operating long-standing programs.

Judges base their selections on the creative features of the applicant's programs, their purchasing practices, and their overall success at reducing waste and increasing recycling.



Many schools practice environmental stewardship with school-based beautification projects. School recycling programs often extend into the local communities. In several cases, the school program is the largest recycling effort the community has, and the reason why local citizens, businesses, and tribes are staying involved in the recycling effort.

The Terry Husseman Sustainable Schools Awards Program provides awards to schools in three categories: The Seed Award, Environmental Curriculum Award., and Sustainable School Award.

1. Seed Award

The intent of this category is to encourage schools to take steps necessary to embrace the five areas of sustainability and to assist with costs involved in initial start-up of basic sustainability programs or improvements of programs or projects that move them closer to sustainability. Schools can apply for assistance to:

- Purchase equipment needed for sustainability programs and educational material.
- Implement or expand sustainable activities.
- Incorporate sustainability lessons into the regular teaching curriculum, which meet the goals established by the State of Washington Environmental Learning Standards.

2. Creative Environmental Curriculum

The intent of this category is to recognize original curriculum that:

- Introduces students, teachers, staff, and administrators to the concepts of sustainability including its social, economic, and environmental relevance.
- Strives to instill a sense of environmental stewardship in the students.

3. Sustainable School Program

The intent of this category is to recognize programs that contain elements of:

- Resource/Energy Conservation.
- Biological Diversity.
- Waste and Toxicity Reduction.
- Social Harmony.
- Health and Wellness.

School programs may also include other elements related to sustainability.

Table 3.6
Winners of the "Terry Husseman Sustainable Schools Awards"
for the 2002-2003 School Year

Seed Award-$2,500 each

Blue Ridge Elementary, Walla Walla School District
Meridian High School, Meridian School District
Heritage High School, Evergreen School District
Glacier Park Elementary, Tahoma School District

Environmental Curriculum-$1,500

Republic Elementary School, Republic School District

Sustainable School-$1,500 each

Lincoln Options Elementary, Olympia School District
Robert S. Lince Elementary, Selah School District
Green Park Elementary, Walla Walla School District
Harmony Elementary, Mount Baker School District
Mount Baker Junior/Senior High, Mount Baker School District
Acme Elementary, Mount Baker School District
Kendall Elementary, Mount Baker School District
Crestwood Elementary, Kent School District
Komachin Middle School, North Thurston School District

For more detailed information about the School Awards Program or guidance on how to establish a program in your school, please visit our website at http://www.ecy.wa.gov/programs/swfa/terryhusseman.html.

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.

The Education Committee received a grant to hire a project manager to implement a project called **"Rural recycling pilot project."** One of the goals of the project is to work with a rural community, Island County, to use social marketing concepts and develop a marketing plan focused on increasing participation in their drop box recycling facility. This will include surveying of residents to determine their attitudes and behaviors towards recycling. The other goal is to develop strategies that other rural communities may find useful for implementation locally.

The Closed-Loop Scoop Newsletter

The Solid Waste and Financial Assistance Program (SW&FAP) publishes a statewide quarterly newsletter called *The Closed-LoopScoop*. 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 2002, 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.

The Department of 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. The department set five goals for sustainability during the 03-05 biennium:

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

The department's plan can be viewed on the internet at http://www.ecy.wa.gov/biblio/0307020.html.

Sustainability Training for SW&FAP Staff

Governor Locke's Executive Order 02-03: Sustainable Practices by State Agencies included seven guiding long-term goals. Each state agency was to develop and update a biennial Sustainability Plan with these goals in mind. The Solid Waste and Financial

Assistance Program (SW&FAP) took the first goal to heart: "institutionalize sustainability as an agency value." We feel that if we are promoting sustainability, we need to ensure we were following our own advice. Therefore, we launched into a challenging sustainability training for our staff.

We issued a Request for Proposal to help design a "tool kit" for staff that would help them incorporate sustainability into their daily jobs. We had several good proposals, and ended up contracting with Axis Performance Advisors, Inc. As we were designing the training, we found that an action plan would be more useful than an actual kit. SW&FAP staff often work in groups that include other program employees with similar job functions, called Job-Alike-Groups (JAG). Axis Performance Advisors, Inc. took advantage of this group structure to design sustainability sessions that would result in each group developing an action plan for sustainability. Every staff member participated in one or more of these sessions. The Program Management Team also went through this exercise as a group.

The purpose of these sessions were to tie our jobs directly to sustainability through the Beyond Waste Goals. These goals are:

- To influence significant reduction of wastes and toxic substances used.
- To shift toward a system where resources are used more efficiently, and excess materials are reused as resources.
- To support efforts in Washington state to make sure businesses' needs are met, while protecting the environment.
- To incorporate these principles into all waste-related decisions.

Each JAG assessed what they are currently doing in their daily jobs and envisioned what their jobs would be like if they were sustainable. They were then asked to determine the steps that would take them to the sustainable job. Through this process, staff determined actionable items that they will work on over the next two years to keep moving them towards their "sustainable job."

The outcomes of this meeting are great steps towards attaining a sustainable program; each employee will have sustainability in their annual work plan, as well as a discussion about applying sustainability in their work with their supervisor during their annual review. The sessions have also helped each JAG to define their role in promoting and moving us toward sustainability.

Another outcome of the sustainability session was the creation of a sustainability cadre. 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 well as earning the title of "sustainability champion." His job, along with the cadre, is to keep

sustainability alive and continuously challenge our employees to become more sustainable.

Ecology's Waste Reduction and Recycling Committee

As part of Ecology's "Walk our Talk" initiative, there has been a lot of work done to reduce the impact Ecology's staff and operations have on the environment and the communities we live in. Staff participate on several committees looking at how we can reduce our impact. Committees include the Commute Trip Reduction, 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.

3. To be environmental stewards by integrating waste reduction and recycling into our work ethics.

WRRC Accomplishments include:

- Developing 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.
- Developing a strategy to reduce waste by improving purchasing practices. Drafted an agency policy on Purchasing and Using Environmentally Preferable Products, along with implementation guidelines.
- Working with Central Stores to identify and suggest environmentally preferable products for them to carry, including 100% recycled, process-chlorine-free paper.
- Issuing a paper reduction challenge and awareness campaign.
- Surpassing our 2002 target recycling rate within the Lacey building—despite an increase in the number of people who moved into our building.
- Developing a Waste Reduction and Recycling "Star of the Month" recognition program.

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 2003 focused on expanding the state's litter prevention campaign, "Litter and it will hurt," while maintaining levels of litter pickup. Core elements of statewide litter program are:

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

State Expands Litter Prevention Campaign

The "Litter and it will hurt" campaign is a social marketing campaign aimed at reducing litter on Washington roadways. The campaign uses multiple strategies over a several years to first raise awareness, then alter beliefs, and ultimately change behaviors. Key elements include a media campaign (television, print, and radio); operation of a litter hotline; a roadway and retail signage program; a website; ongoing public relations; distribution of litterbags and campaign materials; and an enforcement plan.

In 2003, the campaign was expanded to include billboard advertising, and a massive litterbag distribution program through a partnership with McDonald's restaurants. Both these activities led to significant increases in litter hotline activities and a measurable increase in peoples' awareness of the campaign.

To review, the state launched the "Litter and it will hurt" campaign in April 2002. Campaign strategies were based on research conducted in 1999 and 2001 which indicated that enforcement-themed messages and information about littering fines and penalties would be most effective. The campaign began in 2002 by raising awareness of the campaign slogan, the fines associated with littering, and general information about the litter problem. Additional strategies were added in 2003 to continue to raise awareness, and also begin to alter litters' beliefs: that people **do** care about littering, and that litterers **may** be caught.

Throughout the campaign, telephone surveys have been used to gauge the campaign reach and effectives in terms of raising awareness. Beginning in the fall of 2003, the SW&FAP began a litter survey (last completed in 1999) in attempts to measure the impact of the campaign in terms of how much litter is discarded each year. **The chance of detecting a statistically significant change in the amount of litter is slim; especially since the campaign has only been in effect two years.** Behavior changing campaigns can sometimes take decades to have a measurable impact (i.e. seatbelt and anti-smoking campaigns). Nonetheless, it is important to conduct the survey to gather data that can be tracked over time.

Data continue to suggest that the State has made good progress towards achieving the objectives of raising awareness. Telephone survey results provided to Ecology by Belo Marketing Solutions and Survey U.S.A. are presented in the table below. More specific information about the main campaign strategies follows.

Comparison of Benchmark and Tracking
for the Litter Campaign
April 2002 – August 2003

- 60% of respondents have seen or heard the slogan "Litter and it will hurt." Up from 14% in the benchmark study.
- 70% of respondents remember seeing road signs, posters or a slogan about litter. Up from 57% in the benchmark study.
- 35% of respondents remember seeing or hearing advertising, news or public service messages about littering. Up from 23% in the benchmark study.
- 33% of respondents are aware of a toll free number to report littering. Up from 20% in the benchmark.
- 56% of respondents would say that fines for littering are very severe or severe. Up from 31% in the benchmark.

Media: Humorous television and radio commercials that focus on the fines for littering were broadcast statewide over two four-week periods. Last year, media buys were placed on several stations over 12 weeks to give the campaign statewide coverage. This year, the buy was much more focused, and the spots aired almost exclusively on Fox Sports Northwest, during Seattle Mariner's games. Due to high ratings for the games, and an excellent partnership with Fox, this strategy paid off, and the campaign received excellent exposure throughout the summer. Radio buys were placed on the Mariner's Radio Network and several Spanish-language stations around the state. Used for a second year, the spots feature Torquemada, the Grand Inquisitor from the 15th century, arguing for stiffer punishments for litterers. With fewer dollars spent than last year, the television spots created and estimated 65 million gross impressions, up from 53 million last year.

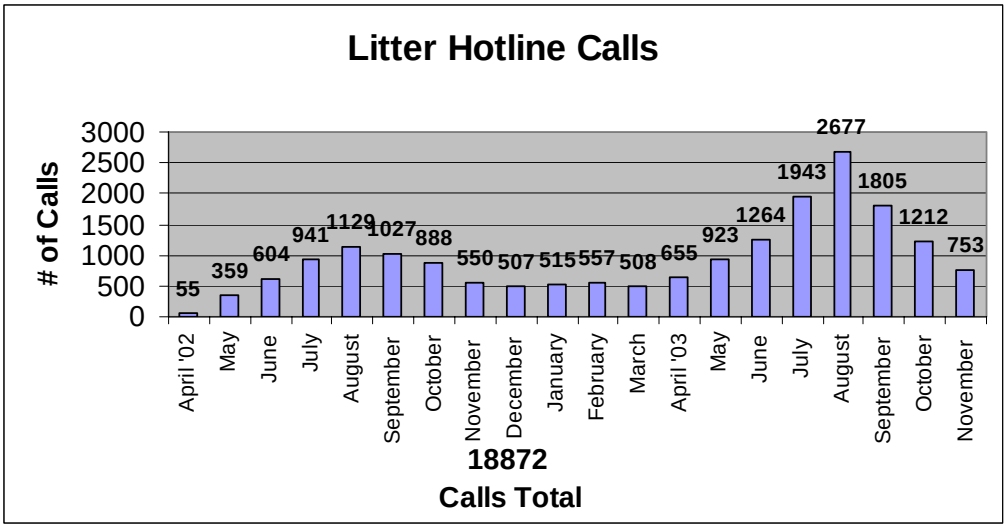
Outdoor: In 2003, dollars were shifted from the television-radio media buy money to support an outdoor element for the campaign. Billboards (picture below) were positioned throughout the summer and into the fall in Seattle, Tacoma, Spokane, Vancouver, and

Wenatchee markets. The billboards featured the litter hotline telephone number formed by pieces of litter.

Litter Hotline: The litter hotline continued to ring off the hook in 2003, due in part to a successful media strategy. By dialing 1-866-LITTER-1, people can report the license plate number of vehicles they see litter coming from. Tickets cannot be issued based on hearsay by the caller. Instead, the license plate is cross-referenced with the registered owner, who is sent a letter from the Washington State Patrol, informing them of the fines they could face if caught littering.

The hotline provides a unique opportunity to communicate one-on-one with a potential litterer. Unlike a television commercial or road sign which they may or may not see, a letter mailed directly to them sends a strong message that littering is not acceptable and asks that they do their part to keep Washington clean. Research has led us to believe this will be an effective strategy. Calls have steadily increased since April 2002, as presented in the Figure 4.1.

Figure 4.1
Litter Hotline Calls



Signage: In 2002, the Washington State Department of Transportation posted 136 "Litter and it will hurt" road signs statewide. The signs feature the campaign slogan and the litter hotline phone number. WSDOT did not add many signs in 2003, but several

local governments who received the sign specifications opted to post the signs on county roads and local streets, furthering the campaign reach.

Website: No additional features were added to the state's litter website, although several items were updated. The website contains information about litter laws, fines, publications, various litter pickup program, and statistics, with separate pages dedicated to information about the campaign. The website continues to be a valuable reference for hundreds of people who request litter information each year. The address is: www.ecy.wa.gov/programs/swfa/litter

Enforcement: Washington State Patrol (WSP) was Ecology's primary partner on enforcement issues. In addition to helping manage the litter hotline, WSP helped the campaign by reinforcing the campaign message through issuance of tickets, and written and verbal warnings. At the time of this writing, statistics from 2003 were not yet available, but in 2002, WSP issued 4,773 litter citations, up from 4,351 in 2001 (almost a 10% increase).

Increasing the amount of litter tickets that are issued is vital to the campaign's success, yet Ecology has little leverage with the law enforcement community. In November 2002, Ecology conducted focus groups with representatives from Washington State Patrol, city police and county sheriff departments from around the state to solicit their ideas for increased enforcement. One of the top recommendations was to conduct extensive outreach with officers themselves, educating them about the litter problem. Ecology hopes to produce a video in 2004 that can be distributed around the state to achieve this goal.

Distribution of Campaign Materials: Late in 2002, Ecology invited the Western Washington McDonald's Operators Association to become sponsors of the "Litter and it will hurt" campaign. McDonald's agreed to distribute 1.25 million litterbags at restaurants statewide as part of a July promotion. They also agreed to display campaign decals at drive-thru windows and use special campaign tray liners at stores in Western Washington during the promotion. They also contributed financially to the production of the litterbags. In exchange, Ecology "tagged" our media with McDonald's logo.

Several other sponsors made the bag promotion possible by contributing to the cost of the bag production in exchange for logos on the bags, messages on the tray liners, and tags on the media. Those companies include: Pacific Science Center, the Washington Forest

Protection Association, the SuperMall of Auburn, Fisher Broadcasting and Fox Sports Northwest.

In addition to the McDonald's bag promotion, Ecology held several other bag distribution events. Campaign car litterbags were distributed at vehicle emission test facilities throughout the summer and Ecology held special events at the SuperMall in June and at a Mariner's game in July. Besides spreading the campaign message, the litterbags are a good way to remind people to put litter in its place.

Future Plans: The "Litter and it will hurt" campaign scheduled to continue through 2004, taking advantage of the positive momentum generated so far. The media will be slightly refined, to focus on more specific messages. Ecology plans on continuing litterbag distribution in partnership with an as-yet-unnamed sponsor. And, Ecology will continue to work with law enforcement, since they are such a critical piece of the campaign.

Litter Program Funding

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 directs the allocation of litter funds as follows: twenty percent to fund 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 funding the Ecology Youth Corps (EYC), the fifty-percent dedicated to clean-up efforts also funds litter activities carried out by other state agencies. Funding for the litter prevention campaign also comes from the fifty percent.

Last biennium (July 2001 – June 2003), the appropriation from the WRRMLCA was $12.43 million divided as directed by the legislation into 3 main categories:

➢ Community Litter Cleanup Program	20%	$2.86 million
➢ Waste Reduction & Recycling Activities	30%	$3.54 million
➢ Litter Cleanup & Prevention	50%	$6.03 million
TOTAL		**$12.43 million**

The fifty percent dedicated to clean-up efforts and prevention was broken down as follows:

➢ Other state agencies	$1.03 million
➢ Prevention campaign	$0.70 million
➢ Administration & coordination	$2.00 million
➢ Operation of Ecology Youth Corps	$2.30 million
TOTAL	**$6.03 million**

During the 2002 session, the Legislature directed Ecology to disburse supplemental funding from the WRRLCA. An additional $250,000 went to the Community Litter

Cleanup Program and an additional $500,000 went to the Department of Natural Resources.

For the new 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 fifty percent dedicated to clean-up efforts and prevention was broken down as follows:

➢ Other state agencies	$1.03 million
➢ Prevention campaign/litter survey	$0.83 million
➢ Administration & coordination	$0.30 million
➢ Operation of Ecology Youth Corps	$2.94 million
➢ Program Administrative Staff	$0.72
➢ Agency overhead	$0.38
TOTAL	**$6.21 million**

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 Departments of Corrections, Natural Resources, Transportation, and the Parks and Recreation Commission.

Using a consensus process, the workgroup negotiates the amount of funding 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 4.1 below. Supplemental funding appropriated in 2002 brought the FY02/03 biennium total to $1.53 million. The amount of funding available to the other state agencies has declined over time as funds were shifted to prevention activities.

Table 4.1
Interagency Agreements between Ecology and
Other State Agency 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. These crews pickup litter on state roads, on state lands, and in local communities, providing valuable cleanup service. The FY02/03 interagency agreement between Ecology and DOC provided funding ($452,000) for year-round correctional crews in Spokane, Ellensburg, Wenatchee, an administrative position in Seattle, and half-year crews in Pasco and Walla Walla. The remaining $14,000 was used to support litter campaign activities, such as displaying campaign posters in all DOC offices, putting campaign window decals on DOC vehicles, and distributing car litterbags at DOC offices. Table 4.2 summarizes activity of DOC crews.

Table 4.2
Department of Corrections Litter Removal Activity
July 1999 – June 2003

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

The FY04/05 interagency agreement with DOC is structured slightly differently than in the past. It provides $264,000 to crews in Wenatchee, Spokane, Tri-Cities, Walla Walla, and Yakima. As a pilot project, the remaining $186,000 of DOC's allocation for the Seattle and Ellensburg crews was distributed as part of the Community Litter Cleanup Program (CLCP - for more information on the CLCP program, please see text below). In the past, both of these crews had contracts with Ecology and the respective local CLCP organization. This year, the money for these two crews was included in Ecology's CLCP contracts with Seattle Public Utilities and Kittitas County. This pilot is an attempt to streamline contract paperwork and simplify reporting requirements for the crews.

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 4.3, this program continues to have a tremendous impact on the cleanup of litter and illegally dumped materials on state-owned forests. The FY02/03 interagency agreement between Ecology and DNR provides funding ($468,000) for part time crews at the following camps: Naselle, Larch, Cedar Creek, Mission Creek (program ended spring 2002), Monroe, Olympic, Airway Heights and the Washington Correction Center for Women (program began summer 2002). In March 2002, Ecology received direction from the Legislature to pass an additional $500,000 of supplemental budget dollars to DNR, bringing the biennial total to $968,000. Funding for cleanup crews was expanded to include contracted and volunteer crew activities as well as some enforcement activities. The litter activity of the DNR cleanup crews is highlighted in Table 4.3 below.

Table 4.3
Department of Natural Resources Litter Removal Activity July 1999 – June 2003

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

The FY04/05 interagency agreement between Ecology and DNR provides funding ($455,000) for part time crews at the following camps: Naselle, Larch, Cedar Creek, Monroe, Olympic, Airway Heights and the Washington Correction Center for Women as well as minimal funding for contract and volunteer crews.

Department of Transportation

The Department of Transportation (DOT) is responsible for picking up litter along state roads including the bags of litter collected by the Ecology Youth Corps, Department of Corrections, and Adopt-a-Highway groups. The FY02/03 interagency agreement between Ecology and Transportation provided funding ($70,000) to offset the costs of disposal. The interagency agreement for FY04/05 is for the same amount ($70,000) and the same activities. Table 4.4 summarizes the litter work accomplished by Transportation crews.

Table 4.4
Department of Transportation Litter Removal Activity
July 1999 – June 2003

Time Period	Amount of Litter Disposed (Cubic Yards)
FY00	10,349
FY01	19,738
FY02	13,757
FY03	21,607
Total	**65,451**
Data provided by WSDOT	

Parks and Recreation Commission

The Parks and Recreation Commission (Parks) traditionally uses litter funds on waste reduction and recycling efforts as well as litter control. Most litter collection is done by park rangers, park users, and volunteers. For the FY02/03 agreement, Ecology provided $26,000 to fund activities including disposal of illegally dumped materials, continued recycling programs in parks, distribution of campaign litterbags and support of a pet waste disposal program. Parks successfully cleaned up several historic dumpsites including sites at Wallace Falls and Nine Mile Creek. Due to the expense of these massive cleanups, the state agency workgroup agreed to increase Parks FY04/05

allocation to $45,000. A majority of the funding will go to illegal dump cleanups, but also support recycling and waste reduction activities at several parks.

Ecology Youth Corps

Fiscal year 2003 marked the 27th year of operation for the Ecology Youth Corps (EYC). Under chapter 70.93 RCW, the *Waste Reduction, Recycling, and Model Litter Control Act*, the EYC operates as a "…litter patrol program to employ youth from the state to remove litter from places and areas that are most visible to the public…"

EYC operates two types of crews, median crews and youth crews. Median crews are composed of young adults 18 years and older who clean complex and challenging areas such as highway median strips, interchanges, and other high traffic areas. Some median crews begin operation as early as spring and run through the end of fall, while others work solely in the spring or fall.

The EYC Youth crews consist of 14–17 year old youth who clean shoulder areas and interchanges of major state and interstate highways as well as city and county roads, public access areas, school grounds and other public areas. Summer Youth crew members work one four-week session at the beginning of summer, with a complete turnover of crews occurring mid-summer.

Crews cleaned roads in the following counties:

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

This fiscal year (July 2002 – June 2003) crews were responsible for picking up a grand total of 64,375 bags of litter over a total of 4,612 road miles and 438 acres. This is the equivalent of 483 tons of litter, or 128,750 cubic feet. Of this total amount of litter 8,116 bags were recycled, representing approximately 61 tons.

The Ecology Youth Corps also ensures that youth learn about the environment. Crews learn about waste reduction, litter abatement, recycling, composting, and other environmental issues such as global warming, water quality, salmon recovery and the principles of sustainability.

This fall, the Ecology Youth Corps began work on a litter survey project that will continue through 2004. Repeating the research methodology used in the last survey in 1999, crews are collecting litter from randomly selected road segments around the state. The litter will be analyzed to determine the generation rates and composition of litter.

Community Litter Cleanup Program

The Community Litter Cleanup Program (CLCP) was developed and implemented in 1998 with the goal of providing help to local government with the growing problems of litter and illegal dumps. Now in its 5th cycle, the CLCP continues to be a key element of statewide litter cleanup programs.

CLCP Program Cycles	
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

During the fifth cycle, 41 out of the 41 eligible jurisdictions participated.[8] In the fourth cycle, $2.73 million was dedicated to the program, with each recipient eligible to receive approximately $66,600. In the spring of 2002, 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 4.5 below highlights the work accomplished during the entire fourth cycle.

Table 4.5
Statistics from the Community Litter Program
July 2001 – June 2003

Volunteer Hours	49,815
Correctional Crew Hours	286,007
Supervisor Hours	78,907
TOTAL HOURS	**414,729**
Road Miles Cleaned	69,189
Acres Cleaned	38,183
Number of Specific Dump Sites Cleaned Up	6,093
Pounds of Litter Picked Up	4,724,110
Pounds of Illegally Dumped Materials Picked Up	3,419,227
Pounds of Material Recycled	1,020,256
TOTAL POUNDS	**9,163,593**

A majority of jurisdictions use jail or community service crews to accomplish the work. Besides the tremendous amounts materials picked up through the program, the use of offender crews provides significant savings to local jails and returns labor value to participating communities. In addition to getting litter and illegal dumps cleaned up and putting offenders to work, a success of the program is getting individuals and businesses involved at the local level, and building a sense of stewardship.

[8] Solid waste planning jurisdictions are eligible to participate in the program. This includes the 39 counties plus the cities of Seattle and Everett.

For the fifth cycle, $2.76 million is dedicated to the program. A major change was initiated with the fifth cycle. In the past, each jurisdiction was eligible to receive the same amount of funding. This meant that small unpopulated counties received the same amount of funding as large populated ones. After receiving input from current recipients, Ecology developed a formula that would take several factors into account when determining how CLCP funding should be distributed. The factors 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 and the system will be evaluated at the end of the cycle.

Looking Ahead

Washington State litter programs seem to be making a difference in our state, offering several bright spots this year. But we must remain vigilant. While approximately 7 million pounds of litter and illegally dumped materials are picked up each year, our research estimates that over 22 million pounds are littered on state roadways and in public areas annually. The "Litter and it will hurt" campaign offers hope that we may finally begin to reduce the quantity of litter deposited on state roadways. Until the litter survey is repeated in 2004, Ecology will continue to monitor several indicators of our progress towards zero litter.

Now that a prevention strategy has been developed and implemented, SW&FAP will devote significant resources continuing the campaign effort, building on partnerships with state agencies, local governments, and businesses to extend the reach and impact of the campaign over coming years. The challenge will be finding a balance between implementing the prevention campaign and maintaining a basic level of cleanup, in light of major budgetary challenges facing the state. Only time will tell if our efforts have a significant impact on the amount of litter in Washington.

Chapter V The 2002 Recycling Survey for Washington

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 the year 2002, over 160 cities and counties offered curbside collection of recyclable materials such as glass, paper, and metals while about two-thirds of those cities and counties 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 on 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 "Beyond Waste" vision of zero waste, we must reaffirm our commitment to an accurate measure of our performance in the area of recycling and waste reduction. The Department of Ecology continues to operate the Annual Recycling Survey, and is concurrently preparing for some changes in the way the survey is conducted in years to come. These changes will take into consideration the state solid waste plan of "Beyond Waste" and the goals laid out in this plan.

Table 5.1
Recycling Rate 1986 to 2002

1986	15%
1988	28%
1989	27%
1990	34%
1991	33%
1992	35%
1993	38%
1994	38%
1995	39%
1996	38%
1997	33%
1998	35%
1999	33%
2000	35%
2001	37%
2002	35%

Recycling Rates

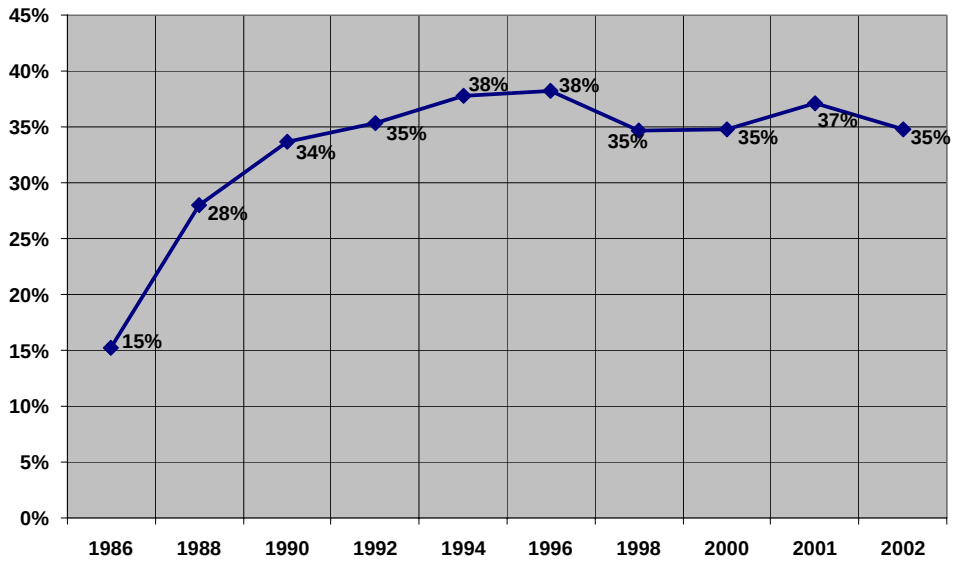
Each year since 1987, Ecology has conducted a survey to measure the statewide recycling rate. Information is provided by local governments, haulers, recyclers, brokers and other handlers of materials from the recyclable portion[9] of the waste stream that are collected for recycling.

[99] 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*.

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 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 have brought the rate back down to 35% for 2002 (See Figure 5.1 for even-year data and Appendix for the complete graph). The Solid Waste & Financial Assistance Program Web site has data on materials recovery since 1986 at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Figure 5.1
Washington State Recycling Rate, 1986 to 2002
Even Years, including 2001



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

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.

availability of recycling as much as expected. Some of the factors which could be influencing this trend include diminishing education on recycling and resulting lack of concern, diminishing concern over landfill space, convenience and cost of recycling, more disposable income thus more spending on consumer goods, product/packaging design and decreased landfill tipping fees, increased waste generation in the commercial sector, and low demand for recycled materials (closing the recycling loop). Another important factor which can influence the recycling rate is the willingness of recyclers to report their collected tons to the Department of Ecology. State law requires collectors of recyclable materials to report what they collect; however, there are no penalties for those who do not comply.

As of this writing, 85.3% 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 half a million new people since 1995. The Department believes that this group 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 1990's.

Frequency of collection (weekly, biweekly) has also been shown to be an important determinate 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 shifting over to co-mingled systems in an effort to reduce costs and increase collection of recyclables. As far as the end markets are concerned, this is producing mixed results. 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 percent. Ecology and local governments are just beginning to gather information on this issue.

Commercial recycling (or nonresidential sector recycling) increased by 21% in 2002.[10] 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 with minimal government regulation or oversight. Businesses are encouraged by the economic incentive to reduce their waste output through recycling.

[10] Includes recyclable material types outside of the municipal solid waste stream, such as construction and demolition debris.

2002 Recycling Survey Process and Results

As mandated by the Legislature, Ecology carries out an annual measure of the recycling activity in the state, and reports the results to the appropriate stakeholders. This mechanism is the annual recycling survey. Given that the survey is essentially voluntary, Ecology believes the results are reliable based on review of draft numbers sent to local governments, and comparisons to waste characterization, disposal data, and commodity end-user information. Companies are asked to report only tonnage collected directly from generators, and additionally, figures are checked against double-counting of materials.

Recycling survey forms are sent to recycling firms, haulers, and local governments to obtain information about types and quantities of recyclable materials collected. However, since reporting is not mandatory and there is no penalty for not returning the information, some firms do not respond. Other 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 information for specific counties. The difficulties also create the need for intensive cross-checking of the data, which is done through a process of communication with the end-users of recyclable materials and local governments to develop aggregate figures for each commodity, which are compared to the survey results collected.

Table 5.2 provides tonnage figures for each material in the 1999 to 2002 recycling surveys. See Tables 5.3 and 5.4 for a comparison of generation, materials recovery, composting, waste diversion, and discards of municipal solid waste from 1986 to 2002.

For consistency of comparison of results from year to year, Ecology continues to include the same materials in the calculation of recycling rates 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 1980's. 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. Information on materials not included in the recycling rate, termed "diverted" materials, is included in the last section of this chapter.

Beginning in January of 2003, for the 2002 reporting year, the survey form along with instructions was available on the Internet to print and complete manually, or to type on-line and e-mail to Ecology. This system provided a possibility to access the form by computer, for participants who were interested. The 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.

Table 5.2
State Tonnage by Commodity: 1999-2002
Washington State Recycling Surveys[11]

Commodity	1999	2000	2001	2002
Aluminum Cans	14,357	17,945	12,540	**12,718**
Aseptic Packaging	N/A	98	69	**26**
Computers & Parts	9	255	317	**1,414**
Container Glass	58,517	84,062	81,632	**64,937**
Corrugated Paper	478,074	495,470	491,230	**417,534**
Ferrous Metals	241,367	357,220	254,104	**432,778**[12]
Fluorescent Light Bulbs	167	160	346	**417**
Food Waste	72,646	73,895	193,024[13]	**70,904**
Gypsum	29,897	36,692	29,883	**51,089**
HDPE Plastics	3,253	5,491	4,841	**6,029**
High Grade Paper	61,212	59,976	58,538	**62,312**
LDPE Plastics	2,225	4,032	6,603	**9,775**
Mixed Paper	253,428	273,494	231,302	**206,051**
Newspaper	168,832	219,716	176,392	**187,585**
Nonferrous Metals	30,956	51,273	41,615	**61,240**
Other Recyclable Plastics	3,971	6,512	4,067	**949**
Other Rubber Materials	N/A	55	374	**166**
PET Plastics	2,911	5,100	4,661	**5,886**
Photographic Films	81	6	87	**517**
Refillable Beer Bottles	63	0	0	**0**
Textiles (Rags, Clothing, etc.)	12,525	15,961	10,127	**9,440**
Tin Cans	12,340	22,632	11,483	**9,417**
Tires	1,514	12,218	10,306	**27,102**
Used Oil	6,352	8,353	38,288	**43,367**
Vehicle Batteries	15,142	10,757	16,297	**12,158**
White Goods	28,524	35,427	39,180	**43,833**
Wood	142,787	215,211	538,242[14]	**394,261**[15]
Yard Debris	525,454	450,761	448,222	**380,882**
Total Recycled	2,166,608	2,462,772	2,703,772	**2,512,788**
Total Disposal[16]	4,480,761	4,610,914	4,611,406[17]	**4,703,879**
Total Generated	6,647,369	7,073,686	7,287,025	**7,216,667**
Recycling Rate	33%	35%	37%	**35%**

[11] Detail may not add due to rounding.
[12] Increase can be attributed to greater reporting from recyclers.
[13] Increase attributed to a combination of actual increase in food waste collection and increased reporting from recyclers.
[14] Increase attributed to a combination of actual increase in wood waste collection and increased reporting from recyclers.
[15] Decrease can be attributed to breaking down into more detailed categories of uses of wood (ie. Wood for energy recovery is tracked, but not included in this number. See diversion numbers in final section of this chapter.).
[16] 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.
[17] Figure corrected for error in Whatcom county disposal.

Table 5.3
Generation, Materials Recovery, Composting,
Waste Diversion, and Discards of Municipal Solid Waste
1986-2002 (even years, including 2001)

Millions of tons[18]										
	1986	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**	**2001**	**2002**
Generation	3.0	5.1	5.6	6.1	6.6	6.5	6.3	7.1	7.3	7.2
Recovery for Recycling	0.5	1.4	1.8	2.0	2.2	2.1	1.6	2.0	2.3	2.1
Recovery for Composting	Neg.	Neg.	0.1	0.2	0.3	0.3	0.6	0.5	0.4	.4
Recovery for Diversion[19]	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	1.4	1.6	2.4
Total Materials Recovery	0.5	1.4	1.9	2.2	2.5	2.5	2.2	2.5	2.7	2.5
Discards After Recovery	2.5	3.7	3.7	3.9	4.1	4.0	4.1	4.6	4.6	4.7

Table 5.4
Generation, Materials Recovery, Composting,
Waste Diversion, and Discards of Municipal Solid Waste,
1986-2002 (even years including 2001)

Percent of total generation										
	1986	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**	**2001**	**2002**
Generation	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Recovery for Recycling	15.2%	28.0%	31.9%	32.7%	32.9%	33.0%	24.9%	28.4%	31.0%	29.5%
Recovery for Composting	Neg.	Neg.	1.7%	2.6%	4.8%	5.2%	9.7%	6.4%	6.2%	5.3%
Recovery for Diversion[20]	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	16.4%	17.7%	25.1%
Total Materials Recovery	15.2%	28.0%	33.6%	35.3%	37.8%	38.2%	34.6%	34.8%	37.1%	34.8%
Discards After Recovery	84.8%	72.0%	66.4%	64.7%	62.2%	61.8%	65.4%	65.2%	62.9%	65.2%

[18] Detail may not add due to rounding.
[19] Not included in Total Materials Recovery or Generation – shown for comparison only.
[20] Not included in Total Materials Recovery or Generation shown in table – shown for comparison only. Comparison calculated as follows: Recovery for Diversion/(Recovery for Diversion + Generation).

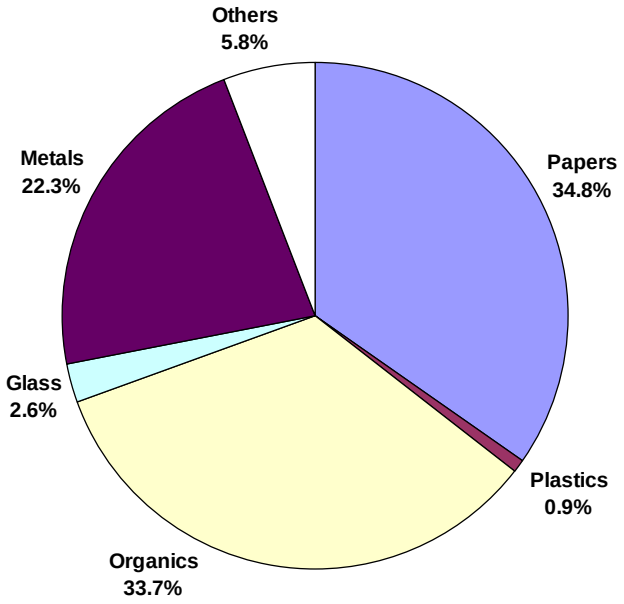
Recycled Materials and Markets

There are essentially three factors that have caused the decline in the recycling rate for 2002. They are: low markets for key materials, more detailed categorization of materials, and fluctuations in reporting of some materials. The downturn in collected amounts of paper confirms that the markets are still poor for this commodity. Wood which is reported as recycled is being broken down into uses and thus categorized more specifically. The wood which is reported as recycled, but has an actual end use as burning for energy, is being tracked as waste diversion instead of recycling, since energy recovery does not fit the state's definition of recycling. Finally, key companies in the areas of food wastes and textiles did not turn in reports for 2002.

The lag in the actual amounts collected for the "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. 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 5.2). Paper comes back this year as the greatest portion of the recyclable stream at 35%. Organic materials (including yard, wood, and food waste) make up 34% of the total recycled. Metals come in third with 22% of the total stream. The other categories make up just 9% of the total collected: glass accounts for almost 3%, plastics for almost 1% and others for almost 6% of the total.

Figure 5.2
Recycled Materials Stream - 2002

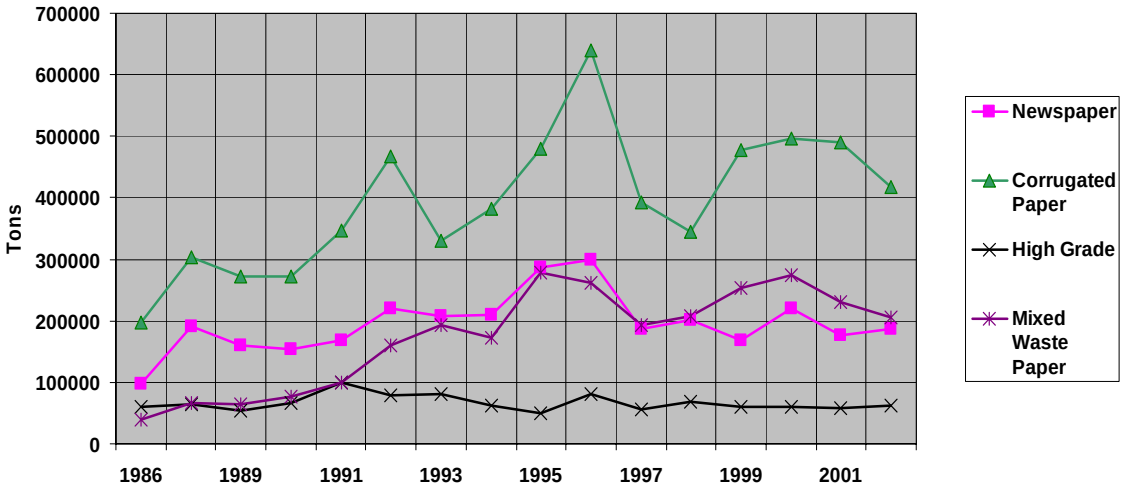


Paper Products

Paper products are back as the dominant category in the recycled materials stream, despite a decrease in corrugated cardboard and mixed paper collection (See Figure 5.2). The increase seen in paper as a percentage of the total recyclables can not be attributed to an increase in the tonnage collected of paper, rather a decrease in recycled tons of other materials. As in 2001, in 2002 there continued to be low paper production at domestic mills which are using recycled feed stocks, thus manufacturer's demand for recovered paper continued low. Figure 5.3 shows the drop in paper recovery for 2002. The Asian markets, however, have an increasing demand and have kept the paper markets from falling out any further.

The market for corrugated paper started to drop in mid-2000 and continued through 2002 for an 80,000-ton decrease in actual tonnage collected. Mixed paper dropped by 11% to continue the decline of 15% from 2000 to 2001. High grade paper saw a slight increase over 2001. Newspaper collection has fluctuated after an all-time high in 1996. In 2002, newspaper is the only paper product to have increased, however by only 6%.

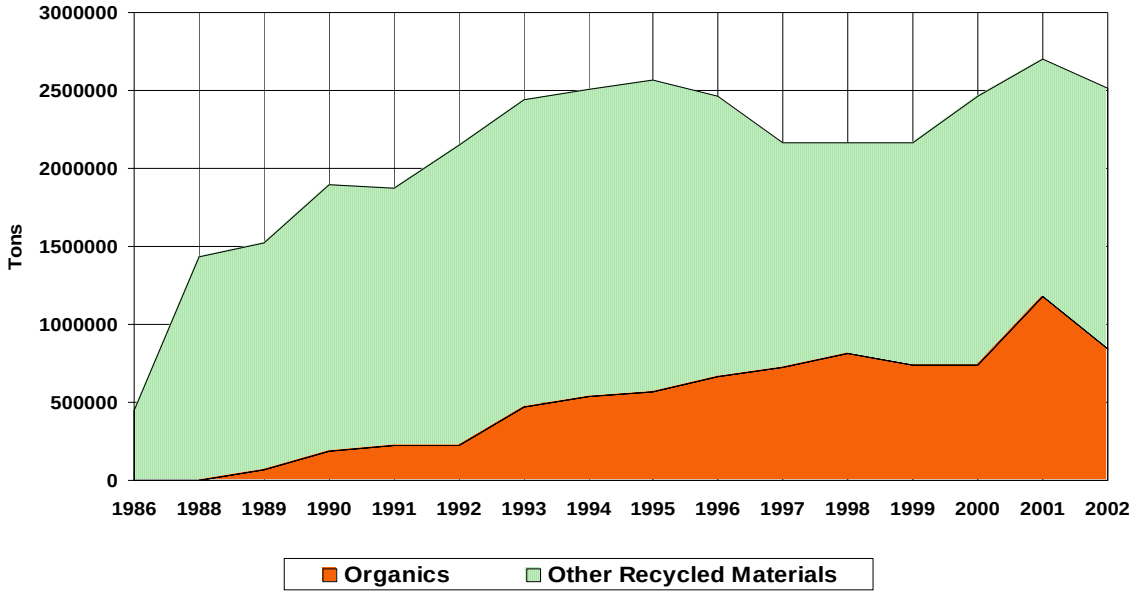
Figure 5.3
Paper Products 1986 to 2002



Organic Materials

Organic materials, at 34%, moved back into second position of the material categories for 2002 (see Figure 5.2 and Figure 5.4). This category is made up of yard, 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 were asked to categorize wood differently this year, separating out what is burned for energy. Only wood that is "recycled" or composted is included in the recycling rate. This can account for the decrease in wood for recycling, although total amounts of reported wood recovered increased in 2002.

Figure 5.4
Organics Recycled 1986 to 2002
Yard Debris, Wood and Food Wastes

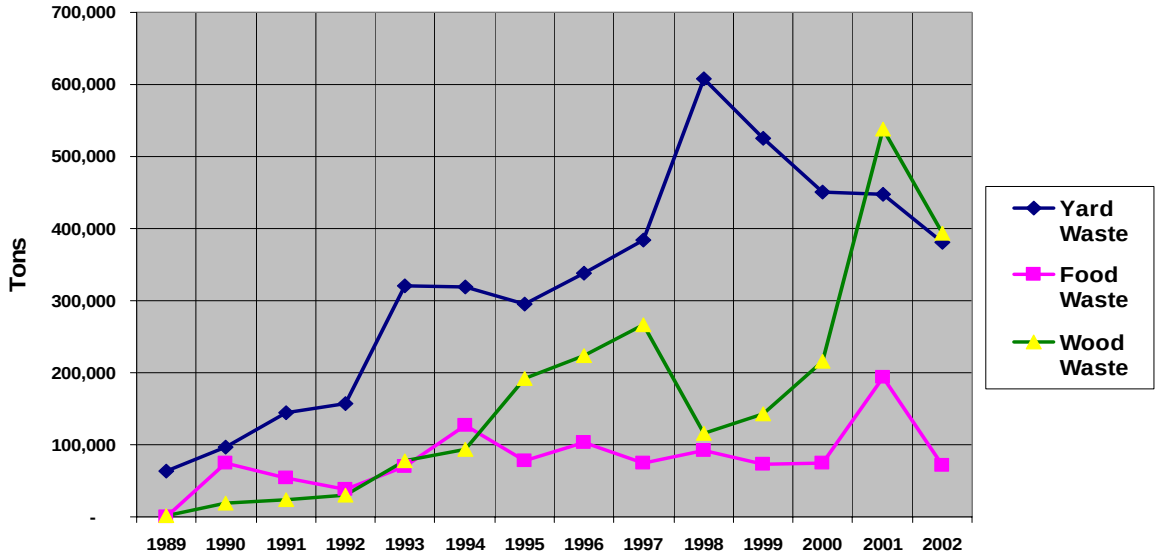


Until 2001, yard waste dominated the organics stream in the recycling survey (see Figure 5.5). With yard waste collection leveling off in 2001 and dropping in 2002, pending the construction and permitting of new composting facilities, wood has surpassed yard debris in amounts collected.

The great increase in reported tons of wood collected for recycling in the past two years is due both to an actual increase in the activity in the area of wood recycling, *and* to better capturing the data on the high amounts of wood which 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 5.10 for greater detail on other uses of wood reported, such as land clearing debris and wood burned for energy).

The food waste category, which has rendering of fats and oils as its greatest contributor, decreased substantially in 2002 due to low reporting.

Figure 5.5
Organics Recycling 1989-2002



Metals

The general category of metals, including ferrous, nonferrous, white goods, and aluminum and tin cans, increased from its 13% of recycled materials share in 2001, to 22% in the year 2002 (see Figure 5.2). All categories of metals increased from 2001 to 2002, except tin cans which decreased significantly (see Figure 5.6 and 5.7). Reported tons of aluminum cans grew by only 1%, nonferrous metals by 47%, ferrous metals by 70%, and white goods by 12%.

Metals has 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, Ecology worked more closely with metals recycling firms to gain confidence in an attempt to increase reporting. There was some success with this effort, and Ecology plans to continue this work for future surveys. The Department believes that with complete and correct reporting of ferrous metals collection, Washington could see an increase in the total recycling rate of about 5%.

Figure 5.6
Aluminum and Tin Cans Recycled 1986 to 2002

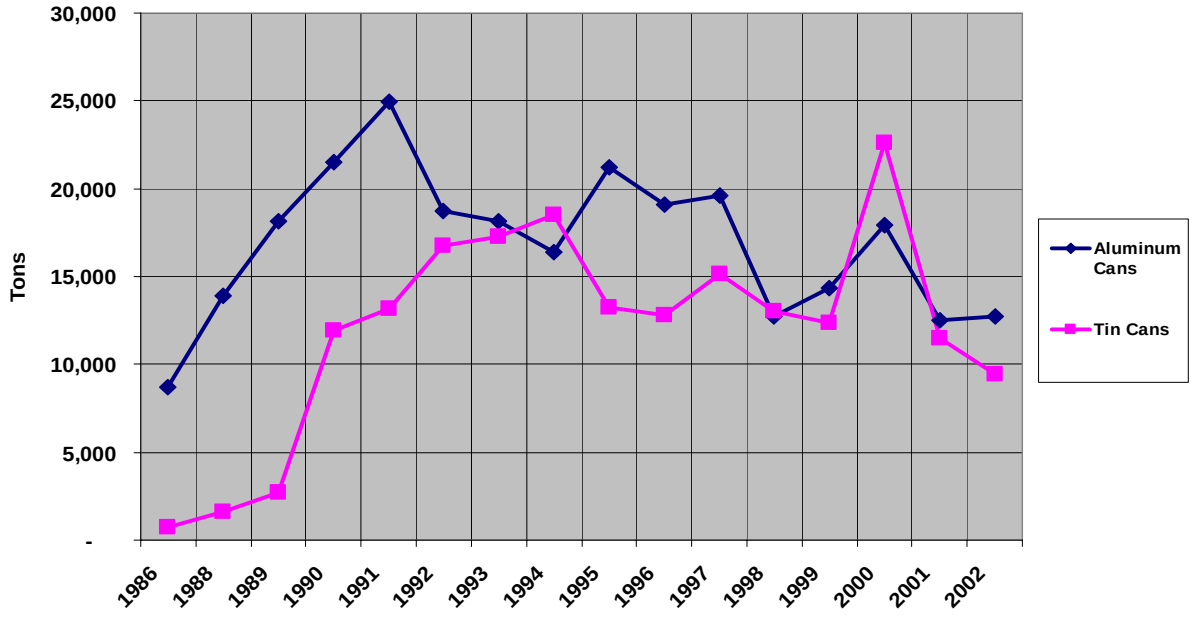
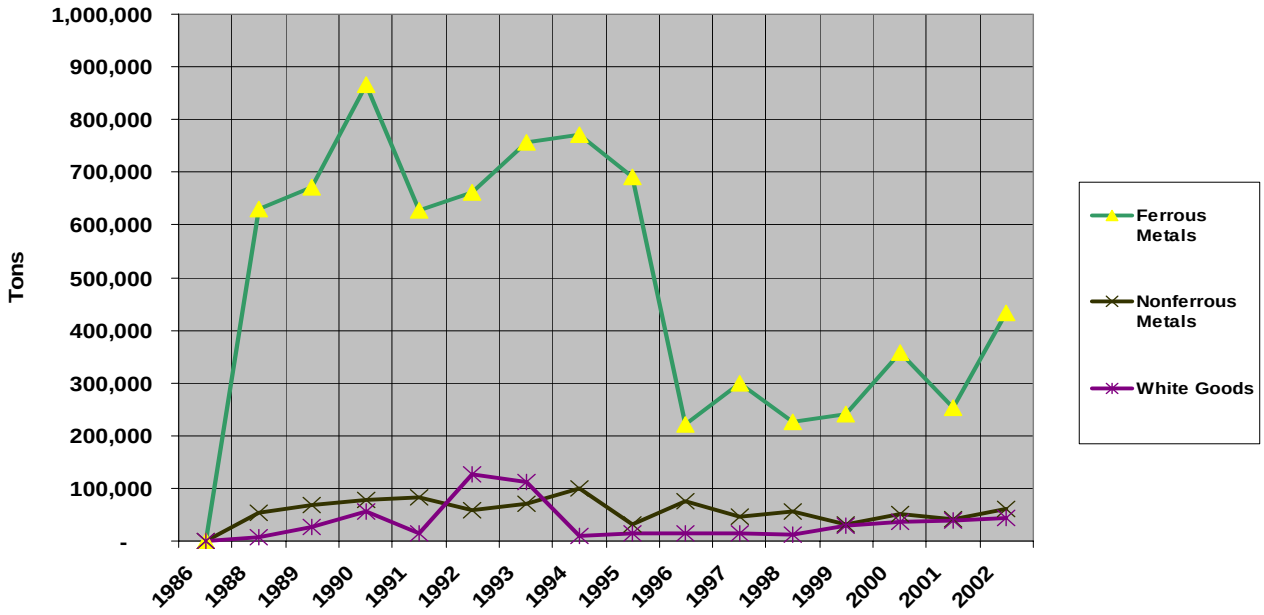


Figure 5.7
Ferrous & Nonferrous Metals Recycled 1986 to 2002



Glass and Plastics

Container glass decreased by 20% in 2002, although it still constitutes 3% of the total recyclable materials stream (see Figure 5.2). The decline in glass indicates a slump in the market for recovered glass (see Figure 5.8). The total of all plastics categories (HDPE,

LDPE, PET and Other) showed a 12% gain over last year. The increase in plastics recovery combined with the decrease in glass and tin recovery could indicate an increased preference for plastic in product packaging (see Figure 5.9).

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 they 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.

Other Recyclable Materials

The "Other" category consists of materials that do not fall under the categories of paper, organics, metals, glass or plastics. It includes Aseptic Packaging, Computers & Parts, Fluorescent Light Bulbs, Gypsum, Other Rubber Materials, Photographic Films, Textiles, Tires, Used Oil, and Vehicle Batteries. There were some fluctuations in the tonnage collected on these materials individually, however the tonnage increased greatly for the category as a whole (see Figure 5.8). Aseptic packaging has been added as a commodity to several curbside programs, including the City of Seattle, in recent years. The commercial collection of computers and parts (or electronics recycling) 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. Tire recovery is treated in greater detail in the next section of this chapter.

Figure 5.8
Glass & Other Materials Recycled 1986 to 2002

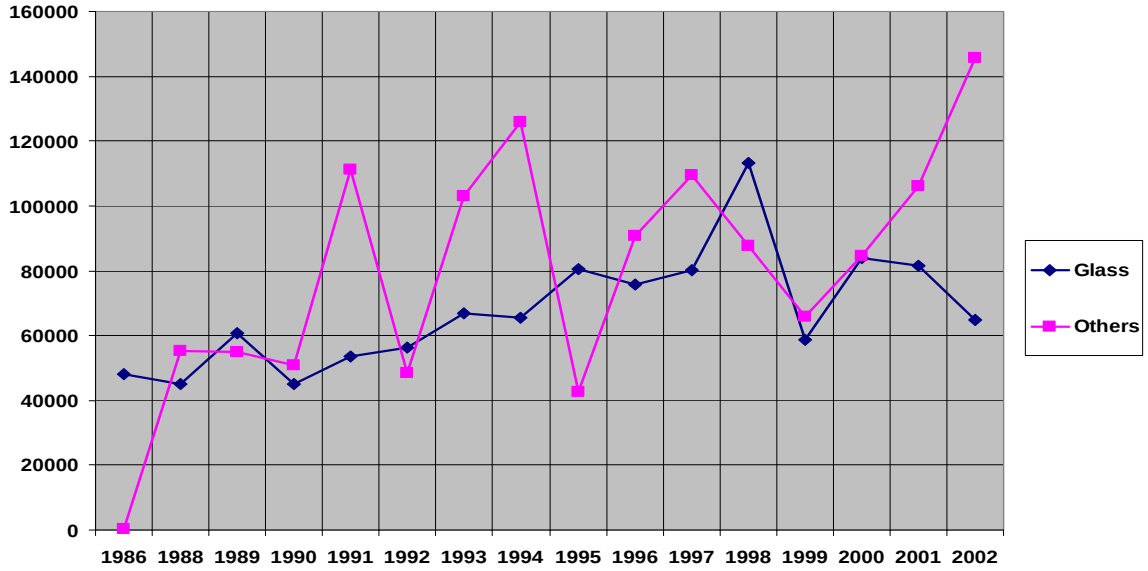


Figure 5.9
Plastics Recycling 1986 to 2002

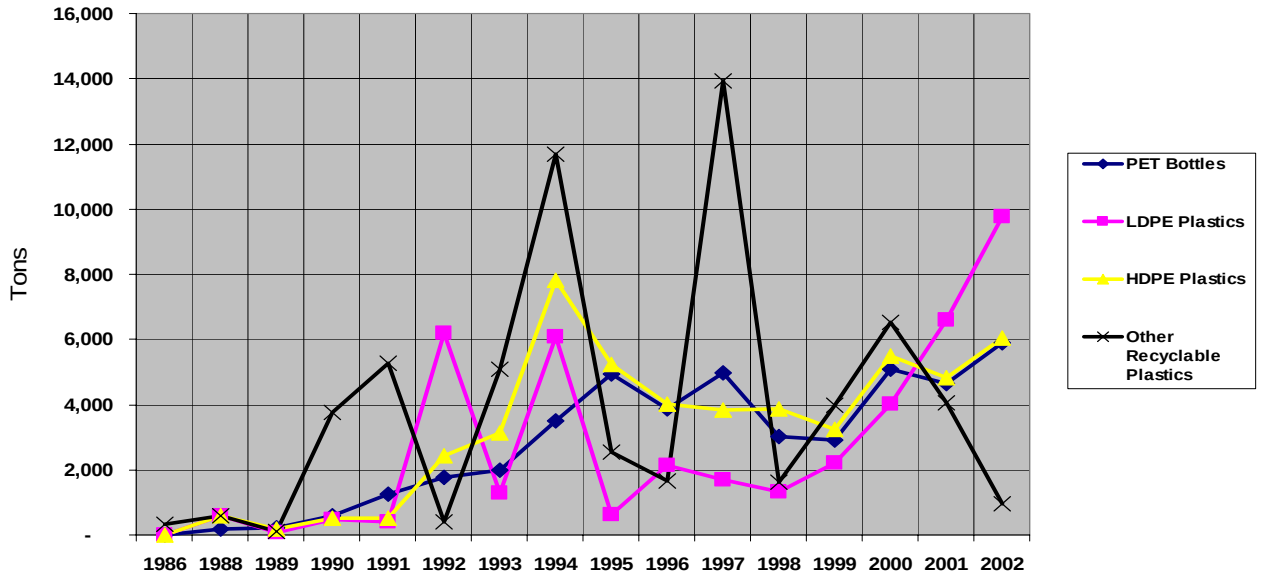
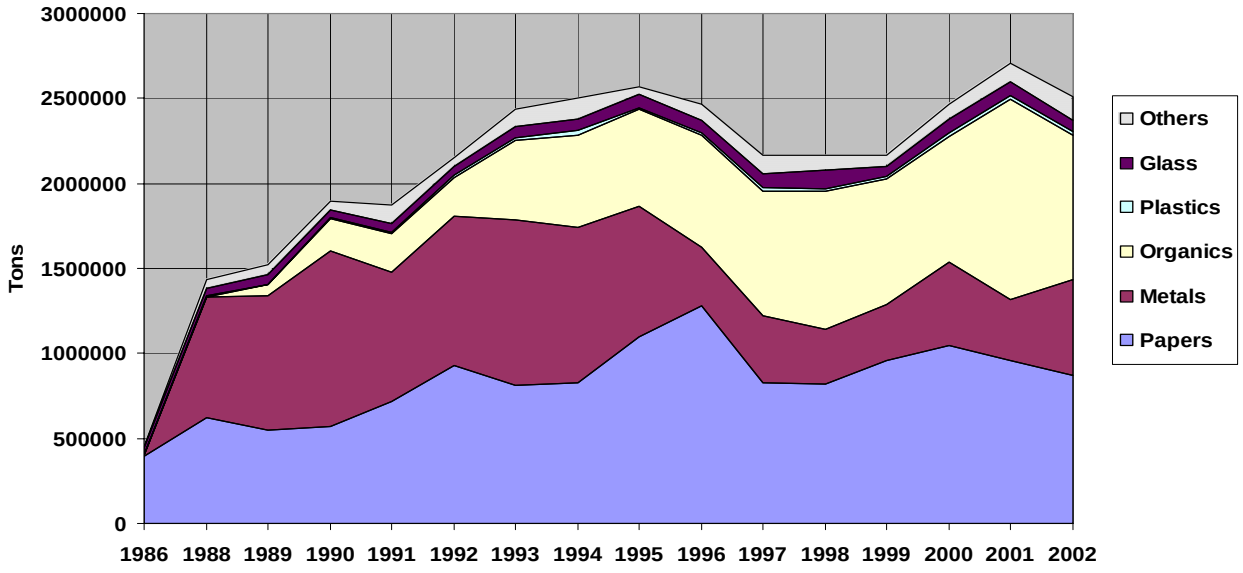


Figure 5.10 shows the relationship of the six major recycling categories discussed above from 1986-2002.

Figure 5.10
Six Major Recycling Categories 1986 to 2002



Scrap Tire Generation, Use and Tracking

This section constitutes the second annual reporting of tire use and recycling as directed by SHB 2308. 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. The first report can be downloaded at: http://www.ecy.wa.gov/biblio/0207029.html. See Chapter III for additional discussion of scrap tires.

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 survey, estimation models, and published information.

A model to estimate used tire generation was based on vehicle registration. Some assumptions were incorporated into the model about the useful life of the average tire, the weight of passenger car and truck tires, and the use of recapped tires. Recycling, recapping, and energy recovery of tires was determined through a combination of data from Ecology's annual 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 and a telephone survey of tire handlers.

Tire Generation, Recycling and Disposal Rates

Based on the average of the estimation models, approximately 4.8 million used tires were generated in Washington State in 2002, including tires from all registered vehicles. Of the estimated total of 4,764,026 tires generated in 2002, Ecology has information on the end use of 65%, or 3,080,176 tires. Of the 3,080,176 tires reported to Ecology for 2002, 2% were recapped, 52% were recycled, and 5% were used as tire derived fuel (see Table 5.5). The remaining 41% reported were disposed of in permitted landfills.

Table 5.5
Generation, Recycling, and Disposal of Used Tires in Washington State
(2002)

	Tons of Used Tires[21]	Number of Used Tires[22]	Percent
Generation	80,988	4,764,026	100%
Unknown Uses	28,625	1,683,850	35%
Reported Uses	52,363	3,080,176	65%
Breakdown of Reported Uses			
Recapping	1,170	68,824	2%
Recycled	27,102	1,594,235	52%
Incineration	2,817	165,706	5%
Landfill Disposal	21,273	1,251,353	41%
Total Reported Uses	52,363	3,080,176	100%

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 percent 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 4,764,026 used tires were generated in 2002.

The 4.8 million tires generated in Washington State in 2002 represent approximately 1.7 percent of the national total of 281 million used tires generated. That figure is 0.9 percent lower than Washington's share of the number of registered vehicles in the United States in 2002. The estimated 5,822,071 registered vehicles in Washington State in 2002 represent approximately 2.4 percent of the 230,428,326 registered vehicles in the United States for 2001.[23]

Table 5.6 shows that passenger tires account for approximately 79 percent of all used tires. The model assumed that each passenger car generates one used tire per year.

[21] 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.
[22] Assumes 40% of trucks use new tires and 60% of trucks use recapped tires.
[23] National data from R.L. Polk & Co. and Automotive Aftermarket Industrial Association, Automotive News Data Center. National data and Washington data excluding trailers for this comparison. Figures were not available for 2002 at this writing.

"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.

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, a rate used by the Rubber Manufacturers Association. The results of this model indicated that there were 6,041,700 tires generated in 2002, approximately 1,277,674 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 2002 was about 5.4 million tires.

Table 5.6
Generation of Used Tires by Vehicles Type

Vehicle Type	Number of Tires Generated	Percent
Passenger Car	3,748,839	79%
Other Vehicles	261,588	5%
Trucks	515,811	11%
Trailers	133,579	3%
Miscellaneous Vehicles	104,209	2%
Total	**4,764,026**	**100%**

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, 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 68,824 used tires reported as recapped in Washington State in 2002.

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 52% of their total collection is eventually recycled. There were approximately 1,594,235 used tires reported as recycled in Washington state for 2002.

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 1,594,235 used tires reported to have been burned for fuel in 2002.

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 21,273 tons in 2002. Also, 18,816 tons of tires are estimated to have been disposed of inadvertently at MSW landfills as part of the residential and commercial waste stream.[24] This is to say that an estimated 2,358,176 of Washington's tires were disposed of at landfills in 2002.

Ecology, in conjunction with the local health departments, also reported that there were 64 known tire piles in the state in 2001 with approximately 2.5 million used tires.[25] Three of these sites are permitted, including Tire Shredders in Goldendale, with approximately 1.8 million used tires.

Individual Waste Generation

Figure 5.11 illustrates an average of how each person in the state contributes to the municipal solid waste stream. What Washington residents generate, recycle and dispose of are about 2 pounds per person above the national averages. The difference is accounted for by a different ferrous metal measurement by Washington and the relatively larger amounts of yard and wood waste than the national average. Along with county review and end-use information these numbers provide a check for the state's recycling numbers. In 2002, each resident of the state generated 6.6 pounds of solid waste per

[24] Based on the "Waste Composition Analysis for the State of Washington", June 2003.
[25] See table with locations by county of known tire piles in "SHB 2308: Scrap Tire Report", page 43.

day—4.3 pounds were disposed of, 1.9 pounds were recovered for recycling, and 0.4 pounds were recovered for composting (see Table 5.7).

Figure 5.11
Pounds Disposed of, Recycled, and Generated Per Person/Day

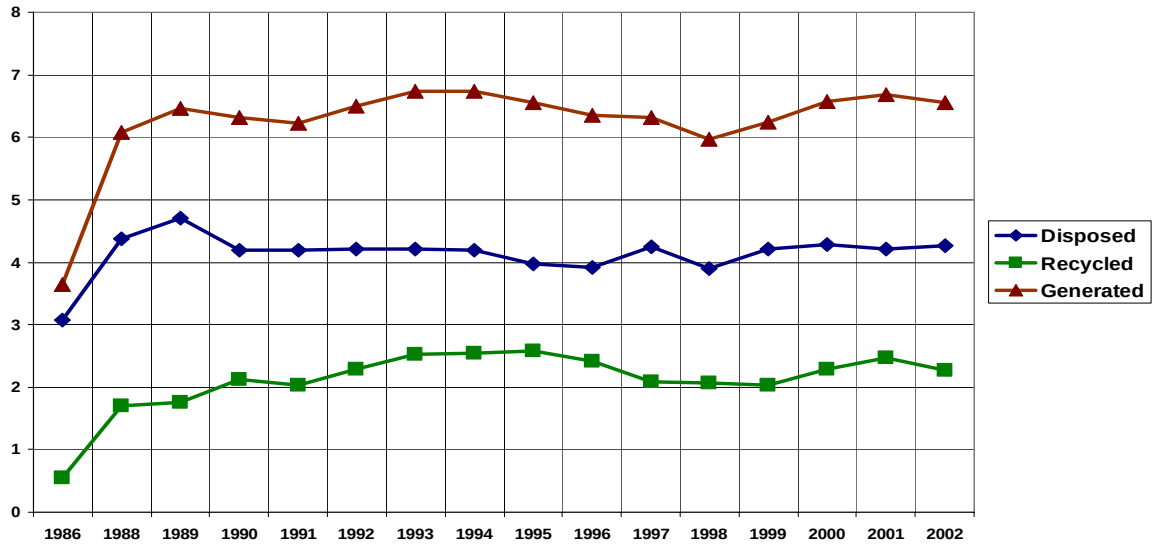


Table 5.7
Generation, Materials Recovery, Composting,
Waste Diversion, and Discards of Municipal Solid Waste
1986-2002

Pounds per person per day[26]										
	1986	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**	**2001**	**2002**
Generation	3.6	6.1	6.3	6.5	6.7	6.4	6.0	6.6	6.7	6.6
Recovery for Recycling	0.5	1.7	2.0	2.1	2.2	2.1	1.5	1.9	2.1	1.9
Recovery for Composting	Neg.	Neg.	0.1	0.2	0.3	0.3	0.6	0.4	0.4	0.4
Recovery for Diversion[27]	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	1.3	1.4	2.2
Total Materials Recovery	0.5	1.7	2.1	2.3	2.5	2.4	2.1	2.3	2.5	2.3
Discards After Recovery	3.1	4.4	4.2	4.2	4.2	3.9	3.9	4.3	4.2	4.3
Population (millions)	4.5	4.6	4.9	5.1	5.4	5.6	5.7	5.9	6.0	6.0

Benefits of Recycling

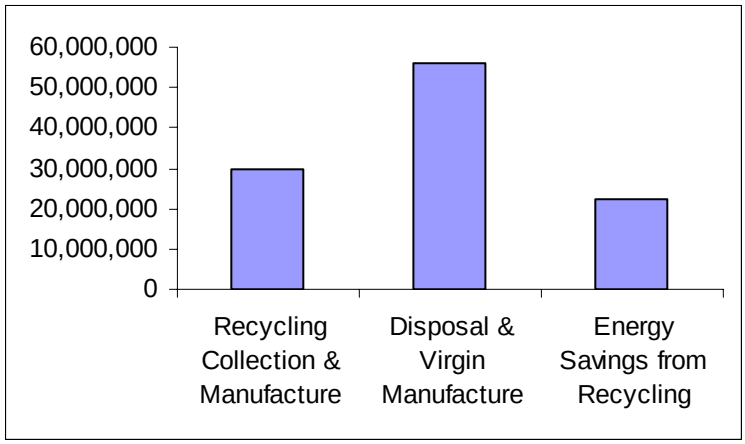
As the legislature recognized when they mandated an increased state goal for recycling, there are numerous environmental benefits to increasing the state's recycling rate. Global warming is one of the state's foremost environmental concerns. Long have

[26] Totals may not add due to rounding.
[27] Not included in Total Materials Recovery or Generation – shown for comparison only.

recycling advocates spoken for the direct benefits recycling can offer when looking at a strategy to reduce global warming. Recycling can be a key component in this strategy. This analysis is an attempt to provide tools which can help decision makers in connecting our actions with this knowledge.

Recycling can significantly reduce the use of energy and the production of greenhouse gases. Figure 5.12 shows the energy savings from recycling as compared to disposal in landfills and virgin material production. Table 5.8 shows the energy used during each stage of the material life cycle. There is a net savings of 11.87 million BTU's per ton of material recycled compared to the production of virgin materials. Table 5.9 shows some of the environmental benefits of recycling based on the actual tonnage of commodities diverted from Washington's waste stream in the year 2002 (as compared to using virgin materials). The energy saved from actual tons of material recycled in the state totaled 22,123,936 million BTU's. The amount of greenhouse gases going into the atmosphere was reduced by 1,163,823 metric tons (carbon equivalent). Please visit the Solid Waste & Financial Assistance Web site (topics related to sustainability) at http://www.ecy.wa.gov/programs/swfa/nav/sust.html for a link to the full document.

Figure 5.12
Comparison of Energy Use through Recycling and Disposal & Virgin Manufacturing (mil. Btu)[28]



In addition to greenhouse gases, recycling can reduce a range of pollutants from entering the air and water. This benefit accrues again because of reduced fossil fuel use and because recycled materials have already been processed once. Recycling has been shown to produce less of 27 different types of air and water pollutants, compared with using virgin materials in manufacturing and disposing of wastes.[29] And, by substituting scrap materials for the use of trees, metal ores, minerals, oil, and other virgin materials, recycling reduces the pressure to expand forestry and mining production. Some of the air

[28] Based on the NERC Environmental Benefits Model and the Washington State Department of Ecology 2001 Recycling Survey.
[29] Based on information from sources including U.S. EPA, the Environmental Defense Fund, Franklin Associates, Ltd., the Tellus Institute, and the Steel Recycling Institute (Northeast Recycling Council).

pollutants reduced through recycling are: ammonia, carbon monoxide, chlorine, lead, metals, hydrocarbons, and methane. Some of the water pollutants reduced through recycling are: acid, ammonia, cyanide, fluorides, iron and sulfuric acid.

The environmental impact of recycling on the amount of wastes diverted from landfills and incinerators is a direct benefit for Washington state in reducing the amount of leachate introduced into groundwater systems and reducing the amount of pollutants released into the air and water. Additionally, the need for siting new landfills is reduced through recycling. Recycling diverted 4,914,401 tons of material from landfills and incinerators in 2002. This figure includes traditionally recycled materials, as well as those that have not been traditionally included, such as asphalt, concrete, and used oil burned for fuel.

Table 5.8
Life Cycle Stage Comparison
Based on the average ton of recycled commodities[30]

	Energy Used During Recycling Collection & Processing	**Energy Used for the State's Mix of Landfill and Incineration**	**Energy Saved During the Recycling Manufacturing Process**
Energy Used during Each Stage of the Materials Life Cycle (mil. Btu/ton)	0.838	0.341	-13.049
Total Energy Used Based on # of tons of Recycled paper, metals, glass and plastics (mil. Btu)	**1,223,338**	**497,135**	**-19,049,322**

[30] Sources: Washington State Department of Ecology and Northeast Recycling Coalition's environmental benefits model.

Table 5.9
Energy Savings and Greenhouse Gas Impacts from Recycling – 2002
Relative to energy required for virgin production[31]

Material/Grade	Tons Recovered[32]	Total Energy Savings Accounting for Recycling Loss Rates (mil. Btu)	Tons Greenhouse Gases Reduced from Recycling Compared to Disposal (MTCE)
Newspaper	187,585	1,803,446	118,372
Mixed Paper	268,363	3,733,728	355,850
Cardboard	417,534	3,012,236	304,835
Glass	64,937	233,322	6,927
Aluminum	12,718	1,927,551	49,703
Tin Cans	9,417	210,915	5,477
Ferrous Metals	476,611	10,674,773	277,186
PET Plastics	5,886	168,239	3,877
HDPE Plastics	6,029	103,978	2,411
LDPE Plastics	9,775	239,381	5,177
Other Plastics	949	16,367	380
Food Waste	70,904	N/A	1,740
Yard Debris	380,882	N/A	9,167
Other Organics[33]	944,066	N/A	22,721
Total	**2,855,656**	**22,123,936**	**1,163,823**

Diversion as a Measurement Option

In reference to recycling, 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.[34] However, Ecology has noted very large increases of recovery or beneficial use in "non-MSW" waste streams, most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and landclearing debris.

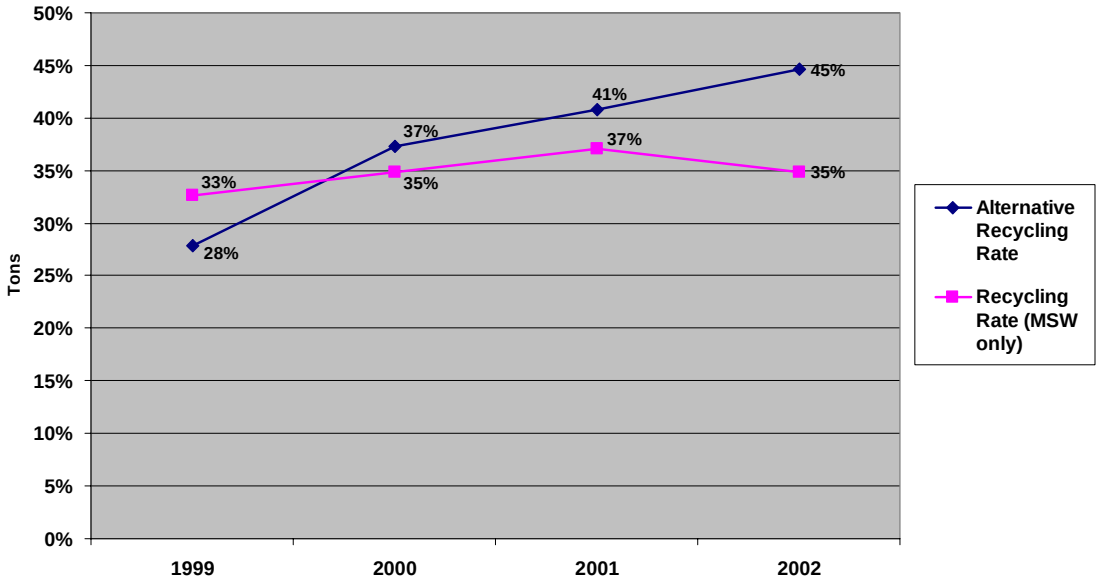
Increasingly, Washington counties and cities have been putting efforts into waste streams outside of the traditional municipal solid waste stream. The best example is for the construction and demolition waste streams. Many of these materials are now being recycled including asphalt, asphalt roofing shingles, concrete, road asphalt, dimensional

[31] Based on the NERC Environmental Benefits Model and the Washington State Department of Ecology 2002 Recycling Survey.
[32] This is a partial list of recyclables collected in 2002.
[33] Includes wood composted and burned for energy, land clearing debris, and other wastes destined for composting.
[34] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

lumber, various metals, and more. Knowledge of this waste stream is increasing. King County[35], 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 and as a feedstock in composting operations and as mulch. A large portion of wood reported as "recycled" is destined for

Figure 5.13
Alternative Recycling Rate Comparison 1999 to 2002
MSW versus All Waste Types[36]

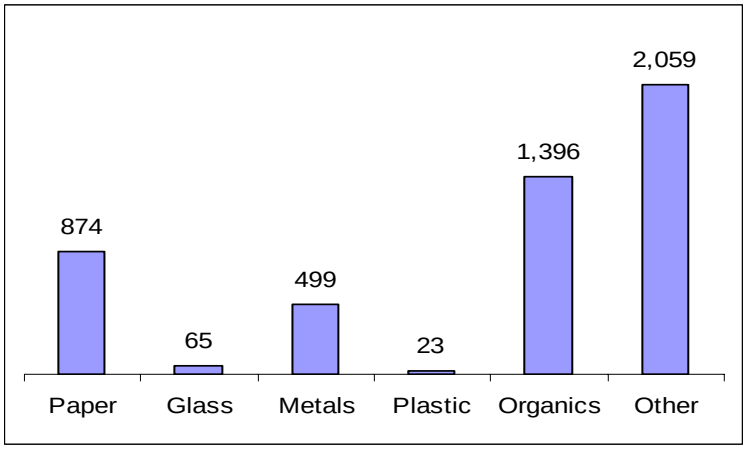


the "hog fuel" market, or burned for energy recovery. In 2002, Ecology began to account for the portion of reported recovered wood which is burned and include it under diverted materials. In agriculture, waste materials are being composted and processed for land application as soil amendments. All of these uses of waste materials avoid disposal for more beneficial use.

Ecology has begun to include other types of materials in the recycling survey, and is calculating a recycling rate parallel to the traditional one, which includes non-MSW recyclables and non-MSW waste types such as inert, construction, demolition, and wood waste and tires. Washington shows an "alternative" recycling rate of 45% in 2002 (see Figures 5.13, 5.14 and 5.15).

[35] *Waste Monitoring Program: Construction, Demolition & Land Clearing Waste*, King County Solid Waste Division, January 1995.
[36] Includes Municipal, Demolition, Inert, Commercial, Wood, Tires, Medical, and Other Wastes. Excludes Industrial Wastes, Asbestos, Sludges, and Petroleum Contaminated Soils.

Figure 5.14
Amount of Materials Recycled (x 1,000 tons)
Including Recycling and Waste Diversion - 2002



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. The new solid waste rule (*chapter 173-350 WAC, Solid Waste Handling Standards*), adopted in 2003, allows waste generators to apply for relief 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. Until Ecology adopts a new definition of recycling, these activities which provide a beneficial use over landfill disposal or incineration, or perhaps even over recycling, will be counted as "diverted" material and calculated into an alternative recycling rate only.

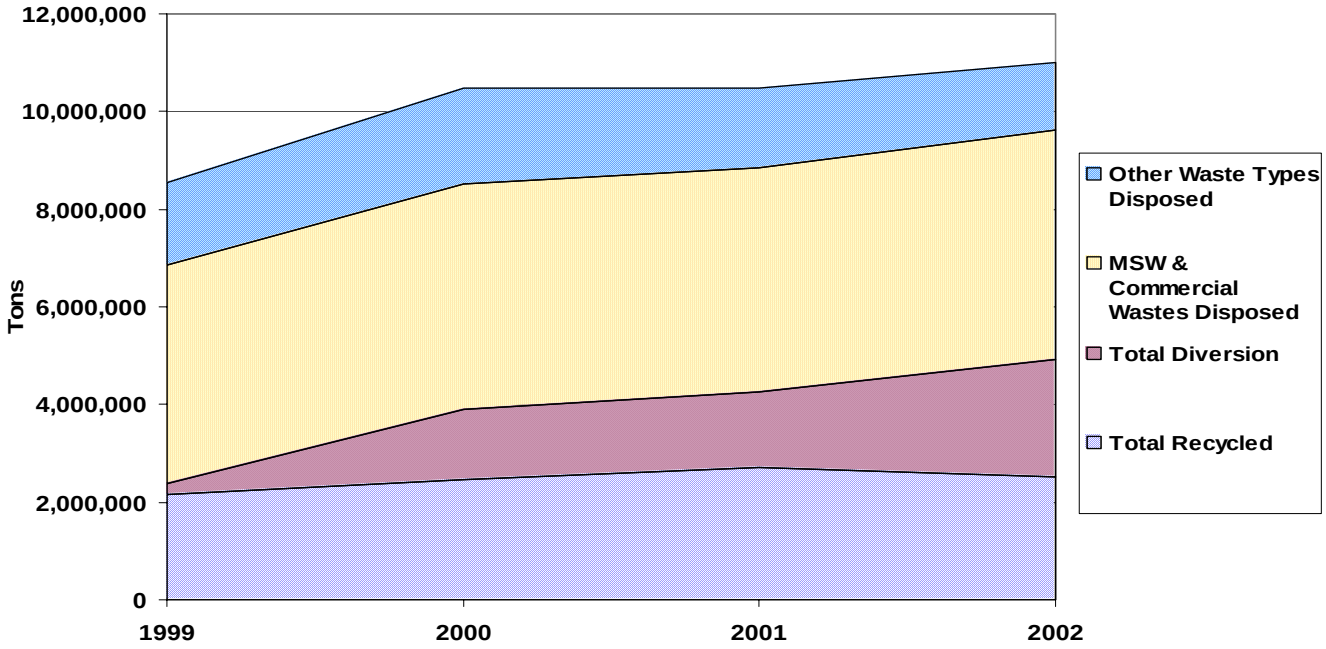
Ecology maintains, however, that these wastes are not well characterized and there is no definitive information on the total volume of waste generated, especially in the industrial sector. The reporting requirement for solid waste recyclables does not include these beneficial use activities; therefore, respondents choose on a voluntary basis to report quantities handled. This lack of information makes it difficult to figure a recycling rate for many of these materials because either we don't know the total amount of waste generated or the beneficial use does not meet the state's definition of recycling.[37] For 1999 through 2002, the materials in Table 5.10 were reported. See also Figure 5.15 for a comparison of Washington waste generation using all waste types.

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 2000 Ecology began asking for it more specifically.

[37] 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

Ecology will continue to collect this information on diverted materials on future surveys. For the most part, these materials are collected and processed outside of the traditional residential and commercial waste stream and were not well addressed in the Waste Not Washington Act of 1989. Still, Ecology recognizes the creative efforts of local governments and businesses in addressing these wastes. This is not an exhaustive list, neither are the numbers complete for these material categories.

Figure 5.15
Washington Waste Generation[38]
Including Waste "Diversion"



[38] Other waste types includes demolition, inert, wood, tires, medical waste and other wastes. It excludes industrial wastes, asbestos, sludges, petroleum contaminated soils.

Table 5.10
State Tonnage by Commodity: Diverted Materials
Collected for Recycling, Not Included in the Recycling Rate
1999-2002

Diverted Material	1999	2000	2001	2002
Antifreeze	1,329	2,475	4,157	4,506
Asphalt & Concrete	49,136	893,218	1,116,871	1,451,959
Asphalt Roofing Shingles	10,334	14,412	11,727	13,825
Carpet and Pad	18	97	820	148
Composting Furnish	N/A	89,678	91,495	67,338
Construction & Demo. Debris[39]	145,605	376,684	131,922	131,701
Household Batteries	23	39	38	333
Incinerator Ash	N/A	N/A	12,015	N/A
Industrial Batteries	41	738	N/A	5
Land Clearing Debris	N/A	N/A	151,464	286,201
Mattresses	N/A	N/A	N/A	77
Miscellaneous	N/A	374	16	N/A
Oil Filters	1.4	835	5,942	5,023
Other Fuels (Reuse & Energy Recovery)	N/A	N/A	N/A	121,349
Oyster Shells	1,563	N/A	N/A	N/A
Paint	N/A	40	87	434
Post-Industrial Glass	N/A	N/A	N/A	2,364
Post-Industrial Plastics	N/A	N/A	N/A	8,118
Reuse (Clothing & Household Items)	N/A	524	601	79
Reuse (Construction & Demolition Items)	N/A	1,257	1,975	76,629
Reuse (Miscellaneous)	N/A	198	334	310
Sand Used in Asphalt Production	N/A	10,000	318	290
Tires (Burned for Energy)	N/A	N/A	N/A	2,818
Tires (Retreads)	N/A	N/A	1,009[40]	1,170
Topsoil	N/A	22,812	N/A	N/A
Used Oil for Energy Recovery	6,256	33,021	19,786	30,838
Wood for Energy Recovery	N/A	121	12,460	196,100
Total Diverted	**214,306**	**1,446,522**	**1,563,035**	**2,401,615**

[39] Includes landclearing debris in 1999 and 2000.
[40] Includes tires burned for energy.

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 2002, 20 municipal solid waste landfill accepted waste totaling 4,744,561 tons.[41] Of the 20 landfills, 14 were publicly owned, and six were privately owned.

Six of the 20 landfills received over 100,000 tons of waste in 2002. 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 939,487 tons, 685,572 and 1,947,240 tons, respectively. In 2002, three landfills received less than 10,000 tons, compared with 12 MSW landfills in 1994. Of those, one closed in 2002, one is located at

41 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.

Fort Lewis in Pierce County and the other is in Grant Counyt. 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)

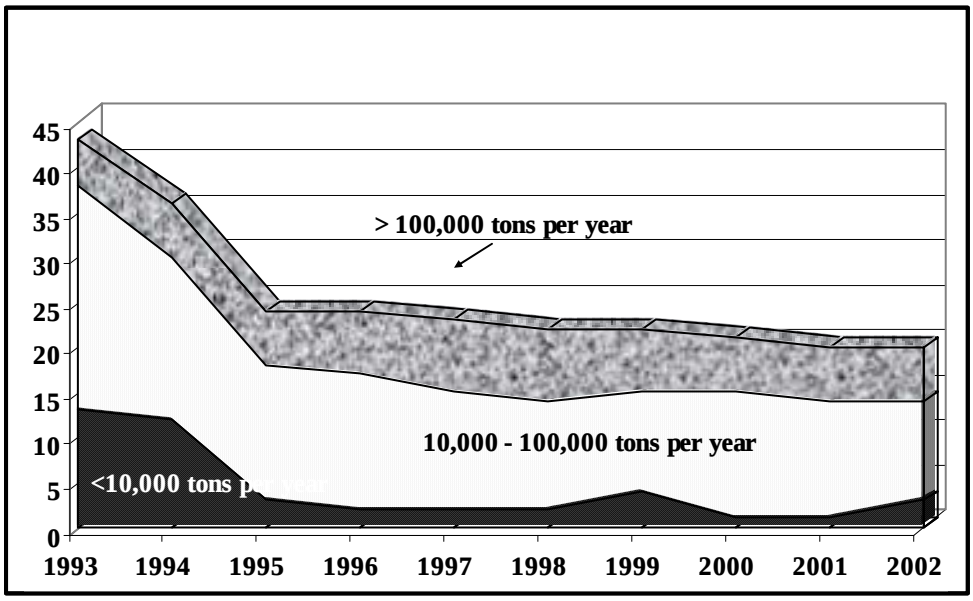


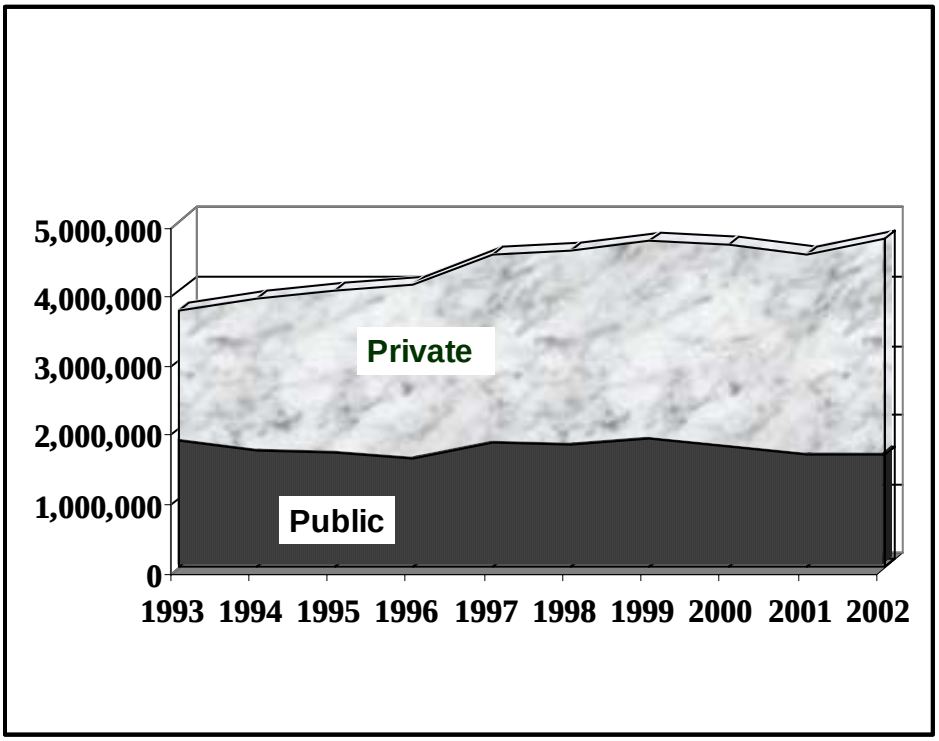
Table 6.1 shows the relationship of waste disposed to public/private ownership. As the table illustrates, 1,629,432 tons of solid waste disposed went to publicly owned facilities (34%), with the remaining 3,115,129 tons going to private facilities (66%).

Table 6.1
Waste Disposed in MSW Landfills – Public/Private

OWNERSHIP	NUMBER OF MSW LANDFILLS		AMOUNT OF WASTE DISPOSED (Tons)		% TOTAL WASTE DISPOSED	
	1991	2002	1991	2002	1991	2002
PUBLIC	36	14	2,696,885	1,629,432	69	34
PRIVATE	9	6	1,192,207	3,115,129	31	66
TOTAL	45	20	3,889,092	4,744,561	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 66% in 2002. 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.[42] Annual facility reports show that a much wider variety of waste is disposed of in the MSW landfills. These wastes need to be considered in terms of remaining available capacity. Fourteen of the 20 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 2002. (See Appendix C, Table C.1 for specific 2002 MSW facility data and Appendix D, Table D.1 for MSW landfill data from 1992-2002).

[42] "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)
Municipal Solid Waste*	2,807,998	3,083,286	3,222,639	3,421,415	3,336,745	3,432,359	3,440,727
Demolition Waste	375,412	385,412	446,172	437,005	569,239	373,254	379,405
Industrial Waste	145,617	163,431	159,781	232,905	88,841	201,198	179,058
Inert Waste	30,061	117,512	107,452	23,875	19,349	26,376	17,092
Commercial Waste	109,093	173,863	158,256	129,070	93,752	66,391	99,048
Woodwaste	57,667	57,128	60,383	68,889	47,087	34,254	55,149
Sewage Sludge	49,205	72,741	67,419	62,920	47,783	1,473	1,762
Asbestos	7,965	9,558	10,684	9,666	7,922	5,991	4,908
Petroleum Contaminated Soils	254,414	444,260	288,407	312,247	231,290	217,721	457,061
Tires	12,787	14,912	19,130	12,581	43,188	8,567	5,776
Special	10	6	904	0	437	917	567
	na	Na	na	na	239	387	372
Other**	233,526	10,809	40,880	28,235	173,711	156,131	103,636
TOTAL	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561

* 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 2002, increased amounts were reported for the categories of municipal solid waste, commercial, wood, petroleum contaminated soils, demolition waste and sewage sludge. All other categories showed a decrease.

Waste-to-Energy/Incineration

Three waste-to-energy facilities/incinerators statewide burned 311,474 tons of solid waste. Of that amount, 10,161 tons were identified as woodwaste at the Inland Empire Paper facility in Spokane and 26,807 tons of woodwaste at the Ponderay Newsprint Company in Pend Oreille County. These two incinerators do not burn municipal solid waste. In 2002, only 6% of solid waste was incinerated statewide. The highest percent of waste incinerated in the state was 12% in 1995. (See Appendix C, Table C.2 for facility specific 2002 energy recovery/incinerator data.)

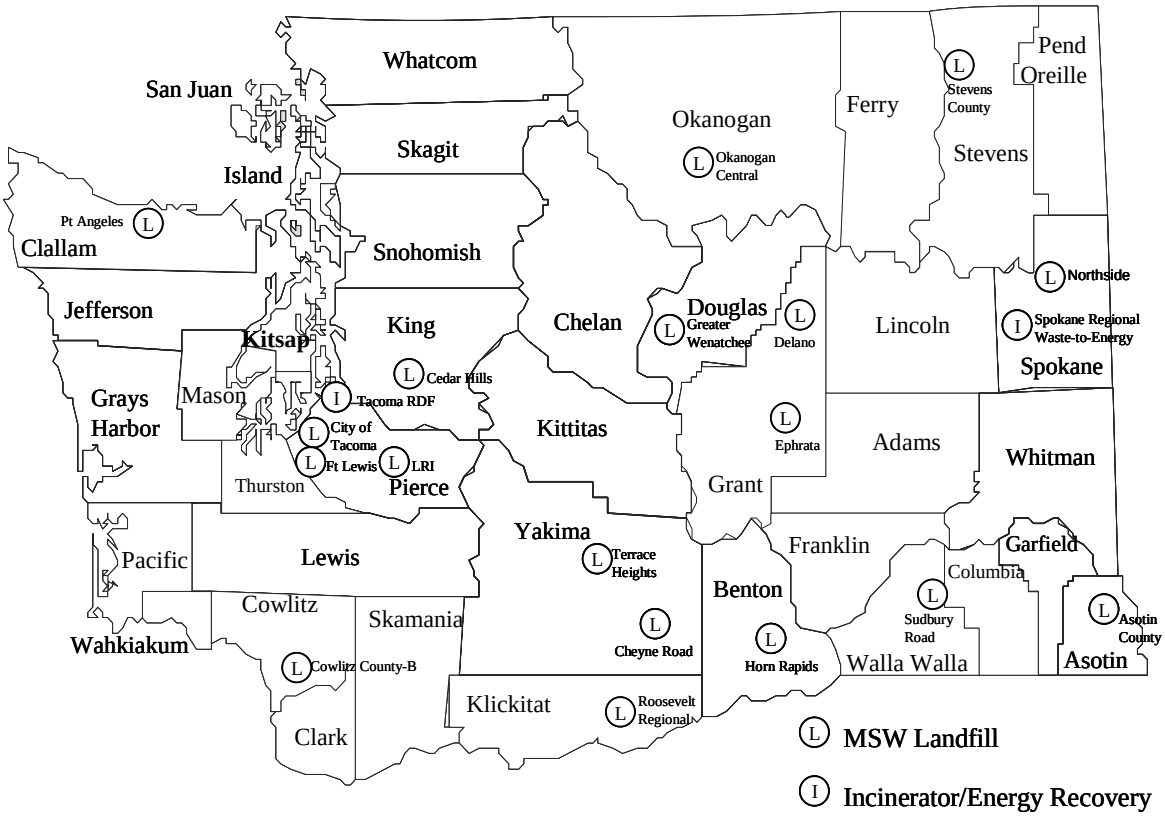
Ash Monofill

For waste-to-energy facilities or incinerators that are regulated by chapter 173-304 WAC, *the Minimum Functional Standards for Solid Waste Facilities*, 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 2002, there was one energy recovery/ incinerator that met this criteria. The municipal solid waste incinerator ash (78,121 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 2003)



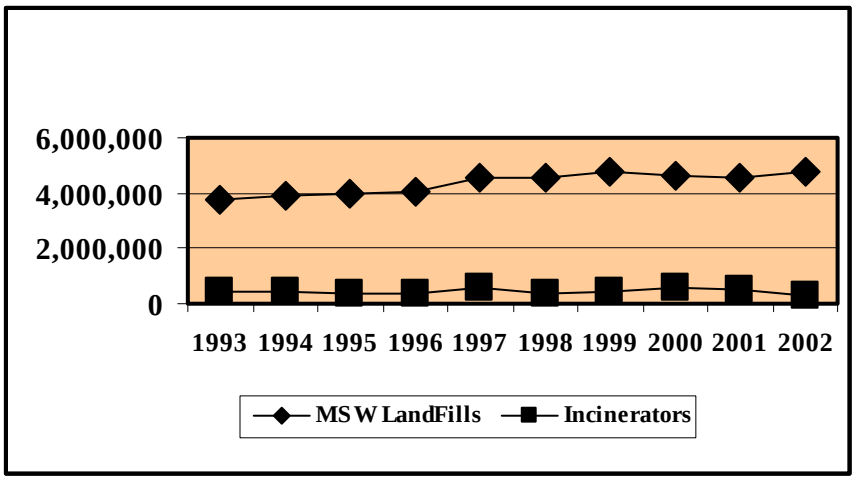
A comparison of the amount of solid waste disposed in municipal solid waste landfills and waste-to-energy facilities and incinerators in 2002 is shown in Table 6.3.

Table 6.3
Waste Disposed in MSW Landfills and Incinerators in 2002

FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	4,744,561	94%
Incinerators	311,474	6%
TOTAL	5,056,035	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 2002 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 2002 (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 are 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 January 2003, the classification and requirements for these types of landfills will change. There will 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. Landfill disposing of demolition or woodwaste will be permitted as limited purpose landfills. The limited purpose landfill category will remain with increased design and monitoring requirements.

For 2002, 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 28 inert/demolition landfills for 2002. There was an increase in demolition and wood waste, but an overall decrease

in other types of waste and the total amount disposed. 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 C, Table C.3 for 2002 facility specific inert/demolition landfill data and Appendix D Table D.2 for inert/demolition landfill data from 1992-2002).

Table 6.4
Waste Types and Amount Disposed at Inert/Demolition Landfills

WASTE TYPES	1996	1997	1998	1999	2000	2001	2002
Municipal	0	0	0	0	0	0	0
Demolition	133,469	262,793	180,268	173,088	259,255	211,901	243,593
Industrial	0	121	0	0	0	0	0
Inert	226,362	326,331	252,506	344,444	180,337	199,256	112,457
Commercial	0	0	0	0	0	0	0
Wood	39	0	156	336	536	167	445
Sludge	0	0	0	0	0	0	0
Asbestos	0	0	4	0	3	3	6
PCS	846	10,285	60,545	17,265	34,742	319,105	120,159
Tires	33	618	449	414	471	765	257
Other	58,953	1	600	605	2,039	2,646	0
TOTAL (tons)	419,702	600,149	494,528	536,155	477,383	733,843	476,917

Table 6.5 includes the types and amounts of waste reported disposed at 12 limited purpose landfills for 2002. There were increases in demolition and asbestos. All other waste types and the overall total were less. (See Appendix C, Table C.4 for 2002 facility specific limited purpose landfill information data and Appendix D Table D.3 for limited purpose landfill data from 1992-2002).

Table 6.5
Waste Types and Amount Disposed at Limited Purpose Landfills

WASTE TYPES	1996	1997	1998	1999	2000	2001	2002
Municipal	0	0	0	0	0	0	0
Demolition	180,529	85,916	98,072	84,140	71,203	71,817	98,827
Industrial	371,496	277,419	225,779	262,021	278,224	325,114	282,747
Inert	141,759	109,174	112,714	136,352	205,902	202,577	195,303
Commercial	0	0	0	0	0	0	0
Wood	22,660	14,589	7,700	8,853	3,205	6,841	2,747
Sludge	0	2,275	0	1,103	0	0	0
Asbestos	512	1,310	1,058	1,549	1,654	1,282	1,311
PCS	98,221	121,066	56,407	8,837	7,159	13,222	9,888
Tires	29,227	434	559	59	25	41	59
Other	65,675	83,600	124,607	66,833	79,291	24,698	14,402
TOTAL (tons)	910,078	695,783	628,896	569,747	646,662	645,592	605,284

Table 6.6 includes the waste types and amounts reported at one woodwaste landfill for 2002. 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 C, Table C.5 for 2002 facility specific

woodwaste landfill data and Appendix D Table D.4 for woodwaste landfill data from 1992-2002).

Table 6.6
Waste Types and Amount Disposed at Woodwaste Landfills

WASTE TYPES	1996	1997	1998	1999	2000	2001	2002
Municipal	0	0	0	0	0	0	0
Demolition	18,780	17,718	21,313	25,121	32,182	31,559	21,275
Industrial	0	0	0	0	15,120	0	0
Inert	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Wood	81,886	69,498	36,777	75,668	33,452	21,739	11,896
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	2,031	8,109	1,320	1,695	622	0	0
TOTAL (tons)	102,697	95,325	59,410	102,484	87,552	53,298	33,171

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. Nine of the 20 active MSW landfills reported receiving over 2 million tons of solid waste from other counties in 2002.

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.

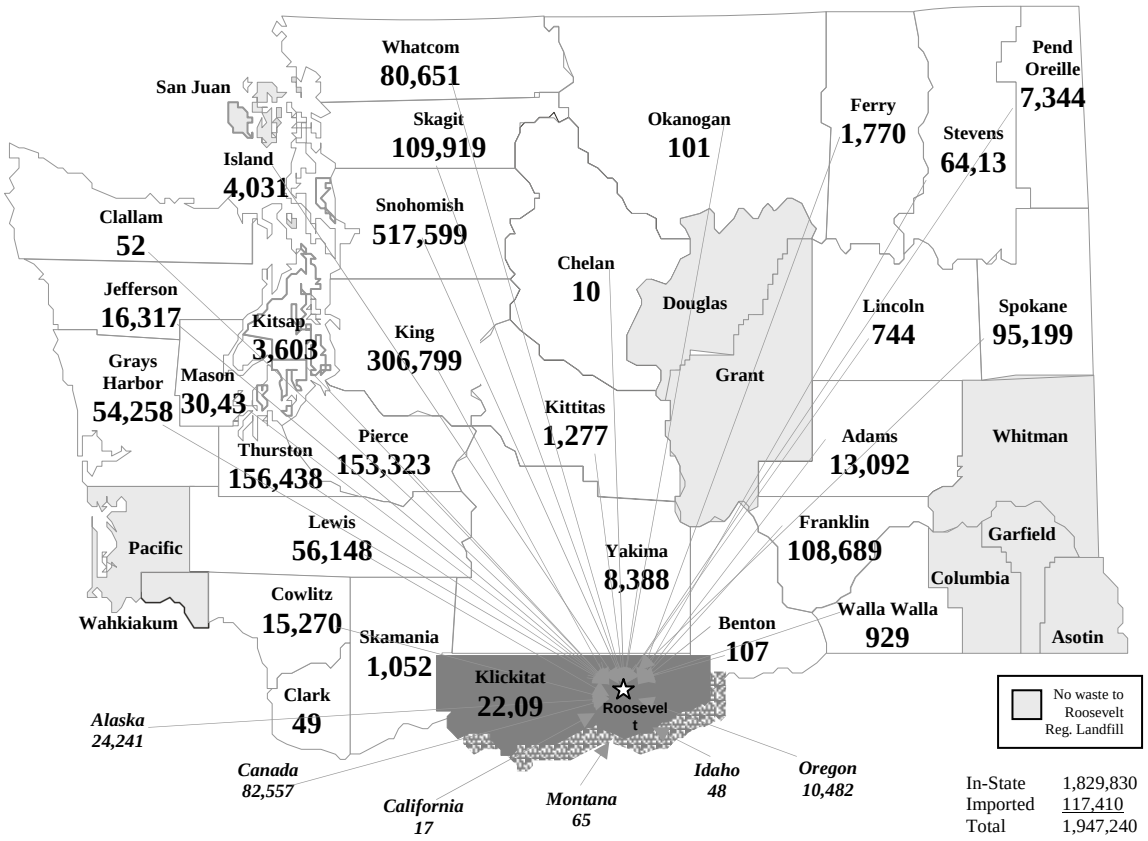
With the closure of many local landfills, Roosevelt Regional Landfill in Klickitat County, and to a lesser extent, Oregon's regional landfills, have become the chosen disposal option. The Roosevelt Regional Landfill received some type of solid waste from 29 of the 39 Washington counties and also from 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 29 counties rely on Roosevelt for the majority of their MSW waste disposal and three other counties send a significant portion of their MSW to Roosevelt. Six 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 1,316 tons of MSW waste from beyond its home county. Two inert/demolition landfills received 822 tons of waste (inert, demolition and PCS) and two

limited purpose landfills received 33,927 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 2002 and previous years information can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/ .

Map B: 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 2002, a total of 165,935 tons of solid waste, about 2.7% of the waste disposed and incinerated in Washington, was imported from beyond the state's boundaries for disposal at municipal solid waste landfills and energy recovery facilities. The amount of waste imported for disposal decreased from a high of 6% in 1996. Accounting for much of the drop in imported waste was the termination of a contract between Roosevelt Regional Landfill and a California entity.

The types of waste received from out-of-state for disposal are shown in Table 6.7. The majority of this waste (117,096 tons) went to Roosevelt Regional Landfill. Of that 82,557 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
Municipal Solid Waste	24,475	100,092	112,097
Demolition	1,412	4,370	6,104
Industrial	0	57,952	42,953
Inert	0	0	1,097
Woodwaste	208	2	35
Sludge	36	0	0
Asbestos	0	243	350
Petroleum Contaminated Soils	0	4,910	1,769
Tires	0	1,622	1.162
Medical	na	0	0
Other	0	33	359
TOTAL	26,131	172,696	165,935

Nez Perce County, Idaho, disposed of approximately 24,000 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. Two limited purpose landfills imported a total of 23,820 tons of waste from Oregon, Idaho and Montana. The Weyerhaeuser limited purpose landfill in Cowlitz County received most of this waste (21,754 tons). One inert/demolition landfill received 1,097 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 2002, a total of 1,425,248 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 Appendix D Table D.5 for imported totals for 1991-2002 and Table D.6 for exported totals 1993-2002.)

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

TYPE OF WASTE	IMPORTED		EXPORTED	
	2001	2002	2001	2002
Municipal Solid Waste	100,092	112,097	915,156	1,001,717
Demolition	4,370	6,104	62,791	99,501
Industrial	57,952	42,953	115,334	111,284
Inert	0	1,097	0	38
Woodwaste	2	35	0	0
Sludge	0	0	0	0
Asbestos	243	350	3,836	5,379
Petroleum Contaminated Soils	4,910	1,769	71,460	199,846
Tires	1,622	1,162	0	0
Medical Waste	0	0	4,868	2,045
Other	33	359	1,919	5,438
TOTAL	172,696	165,935	1,175,953	1,425,248

Major exporters of municipal solid waste in Washington included the City of Seattle (465,926 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.

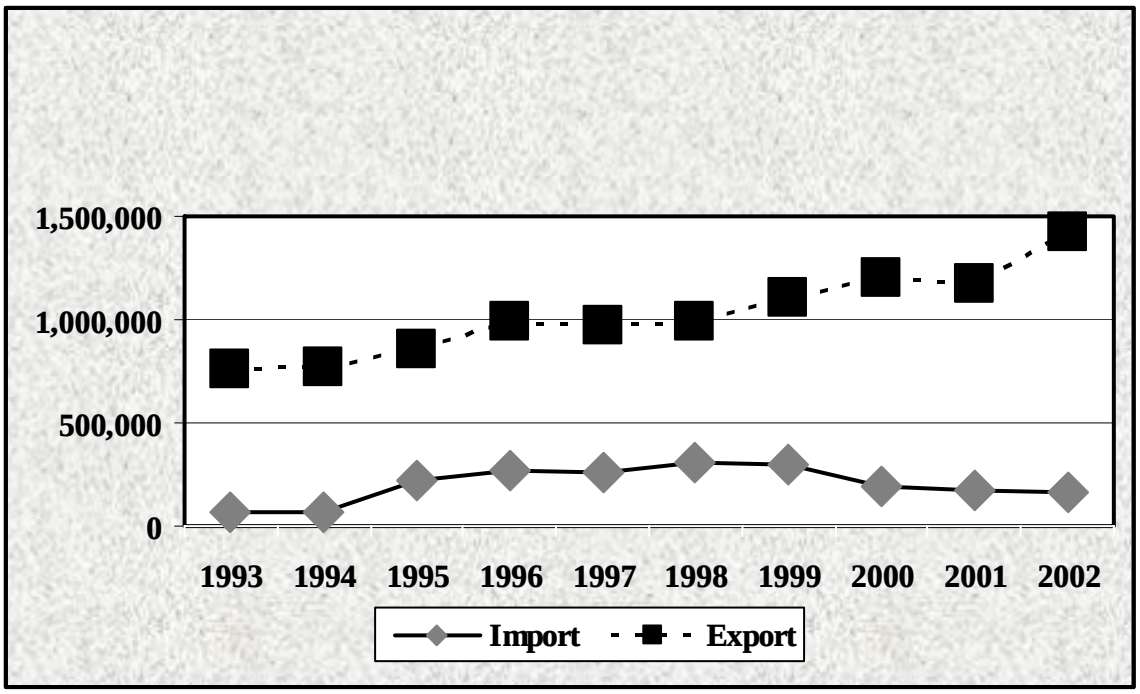
Trends in Interstate Waste Movement for Washington

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 2002.

Map C: Imported and Exported Waste (2002)

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 117,096 tons in 2002. Exported waste amounts increased in 2002, with almost nine times as much waste being exported to Oregon's landfills, Columbia Ridge, Wasco and Finley Buttes, than is imported to Washington for incineration or disposal.

Figure 6.4
Trend of Imported/Exported Solid Waste



Determining the Amount of Solid Waste Disposed

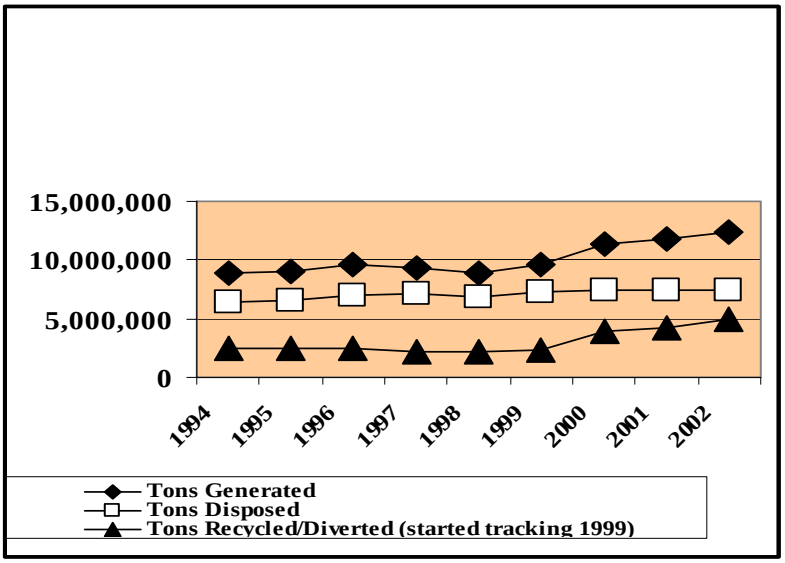
The figure arrived at for the amount of solid waste disposed varies depending upon the types of wastes included, the source of waste generation or the types of facilities included in the calculation. In 1999, Ecology started to track more waste that was diverted from disposal in addition to the traditional 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.

Waste Generated by Washington Citizens for Disposal at MSW Facilities

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[43]). 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 MSW 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, there is still an increase in the amount of waste generated.

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 6.9). The increased population has had a correlated increase

[43] 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.

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 1.23 tons/person/year in 2002). However the recycling/diversion rates has increased over that time from 0.41 tons/person/year in 1999 to 0.81 tons/person/year. While this may indicate less material reaching the landfills, it still shows an increase in the overall amount of waste generated (see Chapter 1 for further discussion).

Table 6.9
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

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 6.10 shows the per capita numbers (pounds/person/day) from 1995 through 2002.

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

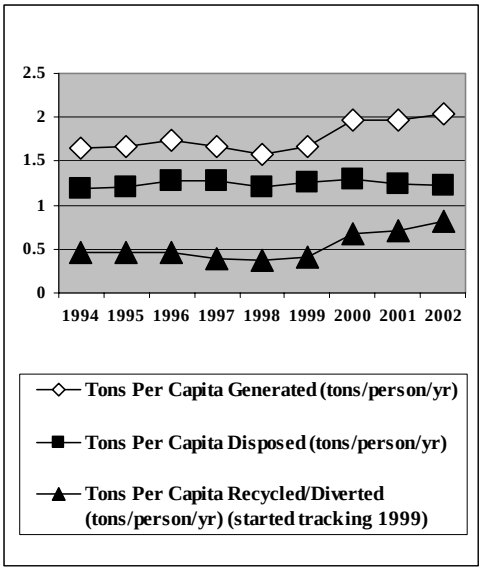


Table 6.10
Per Capita Disposed, Recycled/Diverted and Generated Numbers
(pounds/person/day)

Per Capita	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Disposed[44]	6.49	6.51	6.56	7.00	7.00	6.57	6.87	7.06	6.84	6.74
Recycled	2.58	2.56	2.56	2.51	2.10	2.05	2.25	3.69	3.91	4.46
Generated	9.08	9.07	9.12	9.51	9.10	8.61	9.12	10.75	10.75	11.20

While the overall total of waste has decreased, the municipal solid waste as well as the demolition and commercial portions of the waste stream have increased. Traditional recycling commodities (aluminum cans and glass, corrugated paper, etc.) have decreased while the recycling and diversion of wood waste, asphalt and concrete has shown an increase. There was a corresponding decrease in the amount of these materials reported disposed at the various landfill types. The revised state solid waste plan, Beyond Waste, to be completed in 2004, will provide 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.

Total Waste Disposed in Washington State

The 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). There is a significant amount of waste that is disposed of in-state that is not included in the disposal numbers discussed above.

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, 6,171,407 tons of waste were disposed of in all types of landfills and incinerators in Washington in 2002 (see Table 6.11). (See Appendix D Table D.8 for total solid waste disposed from 1993-2002.)

Table 6.11
Total Amounts of Solid Waste Disposed in Washington

DISPOSAL METHOD	1996	1997	1998	1999	2000	2001	2002
Municipal Solid Waste Landfills	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561
Incinerated Waste	365,464	551,006	369,778	461,684	554,780	496,152	311,474
Woodwaste Landfills	102,697	95,325	59,410	102,484	87,552	53,298	33,171
Inert/Demolition Landfills	873,195	600,149	494,528	536,155	477,383	733,843	476,917
Limited Purpose Landfills	910,078	695,783	628,896	569,747	646,662	645,592	605,284
TOTAL	6,335,189	6,475,181	6,134,719	6,408,878	6,425,959	6,453,904	6,171,407

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

Future Capacity at Municipal Solid Waste Landfills

There are currently 18 municipal solid waste landfills operating as of September 2003. (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 2003, the facilities estimated about 171 million tons, or about 39 years, of capacity at the current disposal rate.[45] In 1994, facilities reported approximately 181 million tons of remaining capacity, about 49 years of remaining capacity statewide.[46] 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 10 have greater than 10 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	0.5%	4	3	1
5 to 10 years	7.5%	3	3	0
Greater than 10 years	92%	11	8	3
TOTALS	100%	18	14	4

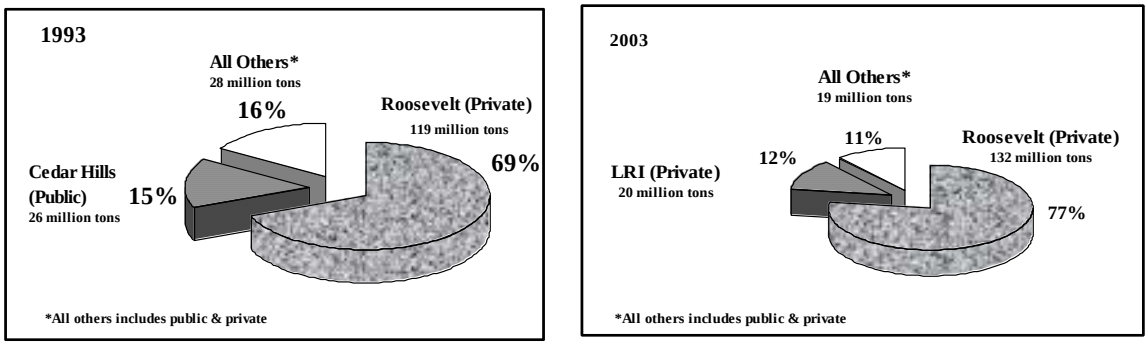
[45] This does not include a site in Adams County that has been permitted for 90,000,000 tons. Construction start of this facility is undecided at this time

[46] *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 2003)

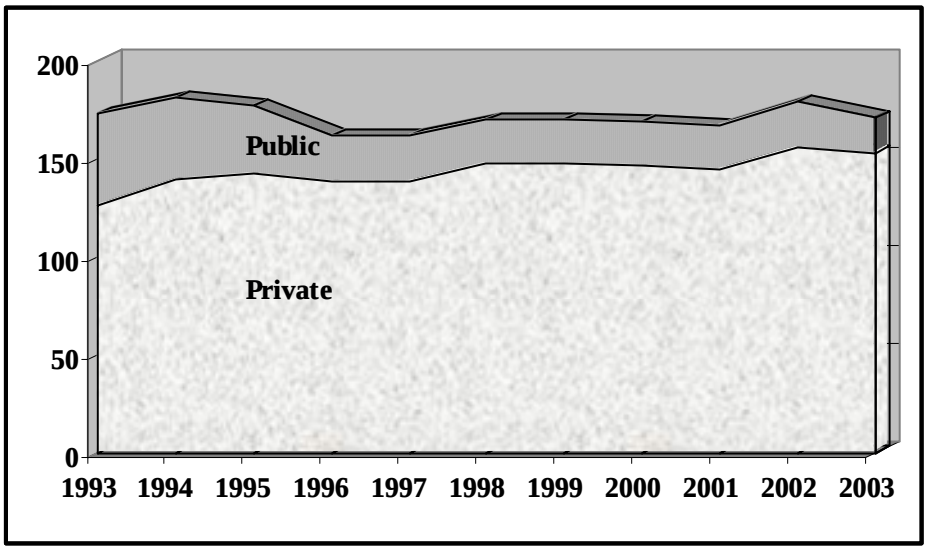
2003 capacity numbers indicated that 92% of the remaining capacity was at landfills with greater than 10 years to closure. Fourteen of the 18 operating MSW landfills are publicly owned with about 10% of the remaining capacity (18 million tons). About 90% of the remaining permitted capacity (153 million tons) is at the four privately-owned facilities, compared to 73% in 1993. The majority of the capacity, about 77% of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 12% of the statewide total capacity is at newly constructed, privately owned landfill in Pierce County, 6% at the publicly owned Cedar Hills landfill in King County, with the remaining 5% 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 2003



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

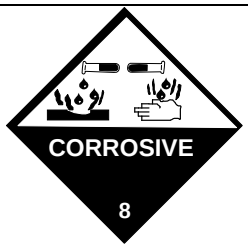
Figure 6.8
Remaining Capacity MSW Landfills
(public/private in million tons)



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 2002, the facility received some type of solid waste from 30 counties in Washington, including the majority of the solid waste from thirteen counties. Waste was also received from Alaska, Oregon, and British Columbia. 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 36 year estimate of total remaining permitted capacity is based on the amount of waste disposed in MSW landfills in 2002. 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 chapter 70.105 RCW, *Hazardous Waste Management Act*. MRW is a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is considered waste that was generated in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from hazardous waste regulations.

MRW FACTOIDS

- Total MRW collection in 2002 was over 24 million pounds.
- The average amount of HHW disposed by the 6% of all households that used a HHW collection event or fixed facility was 146 pounds.
- Kittitas, Yakima, and Skamania counties had the most CESQG waste per capita.
- Columbia, Adams, Stevens, Skamania, Pacific, and Kittitas counties collected the most used oil per Housing Unit.
- Island, Whatcom, San Juan, Yakima, and Skagit counties had the largest percentage of participation per housing unit at HHW events or facilities.
- The two categories of waste type that increased the most in amounts collected are Electronics 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 known as fixed facilities, began to replace the collection events in order to fulfill the need for year-round collection. In addition, collection facilities have further developed with mobile units, satellite facilities, and tailgate events.

These efforts resulted in a larger number of customers served, decreased costs, and increased reuse and recycling of MRW. While the bulk of material collected continues to be HHW, CESQG collection programs have increased. Currently there are 20 public MRW programs that collect CESQG waste, 14 at fixed facilities.

Funding

The 1988 *Model Toxics Control Act* (chapter 70.105D RCW) 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. (See Table 3.1 for the status of the county MRW plans.)

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 by collection events and fixed facilities. This data is translated into the information contained in this Chapter 7 of Ecology's Solid Waste Annual Status Report and is specifically designed to be useful to those who operate or work MRW programs within Washington State.

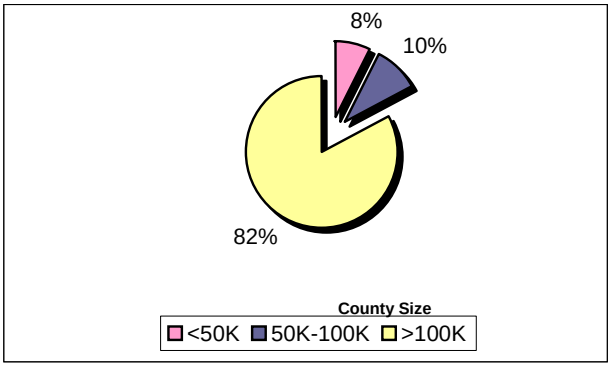
Although Ecology has created and does circulate a standard annual reporting form to all MRW programs, the reported data can vary depending on a program's collection process, how the data is reported, and how the reported data is interpreted.

For the 2002 reporting year only one county failed with submitting the required annual reports; and a couple counties had no activity. In addition, not every program reported all the required information. This report will note key areas where there is unusual data or anomalies.

Year 2002 Data

This year's report focuses on year 2002 data with some comparisons to the data published in last year's report. 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.

Figure 7.1
Percent of State Population by County Size



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 in the form of Seattle Solid Waste Utility, Port of Seattle, and Seattle City Light.

Many HHW collection systems are approaching stability. Most of the state is now serviced with permanent fixed facilities. Only Chelan, Clallam, Douglas, Ferry, Garfield, Grant, and Wahkiakum Counties do not have fixed facilities. Garfield residents use the facility in Asotin County; Cowlitz County conducts a mobile unit in Wahkiakum County; Ferry County usually conducts a collection event, however, did not conduct one during 2002. Clallam, Chelan, Douglas, Grant and Skamania counties also conduct collection events but may convert to fixed facilities in the future.

Collection services for CESQG's continue to expand statewide. For 2002, there are 14 fixed facilities accepting material from CESQG's and there were six collection events providing collection services for CESQG's.

Table 7.1
Individual County Population by Size

<50K		**50K-100K**		**>100K**	
Adams	16,600	Chelan	67,600	Benton	147,600
Asotin	20,700	Clallam	64,900	Clark	363,400
Columbia	4,100	Cowlitz	94,400	King*	1,203,510
Douglas	33,100	Grant	76,400	Kitsap	234,700
Ferry	7,300	Grays H	68,400	Pierce	725,000
Franklin	51,300	Island	73,100	Skagit	105,100
Garfield	2,400	Lewis	70,200	Snohomish	628,000
Jefferson	26,600	Walla Walla	55,400	Spokane	425,600
Kittitas	34,800			Thurston	212,300
Klickitat	19,300	**50K-100K total**	**570,400**	Whatcom	172,200
Lincoln	10,200			Yakima	225,000
Mason	49,800				
Okanogan	39,800			Seattle*	570,802
Pacific	21,000			**>100K total**	**5,063,212**
Pend Oreille	11,800				
San Juan	14,600				
Skamania	9,900				
Stevens	40,400				
Wahkiakum	3,800				
Whitman	40,600				
<50K total	**447,800**				

- **King excludes Seattle**

HHW (no UO sites) Pounds Per Participant by County Size

Figure 7.2 shows the total pounds of HHW (no UO sites) collected per participant by county size in 2001. The average pounds collected statewide per participant for HHW collections was 103.

Figure 7.2
Pounds Per Participant

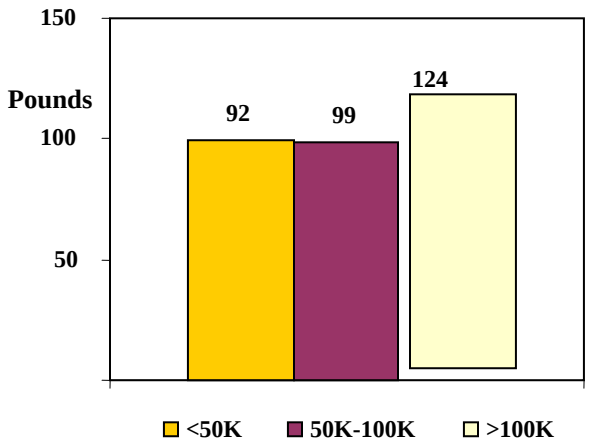


Table 7.2 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2000, 2001, and 2002.

Table 7.2
High Collections of HHW (no UO Sites) Pounds Per Capita by County in 2000-2002

HHW 2000			HHW 2001			HHW 2002		
County	**Size**	**Lbs./Capita**	**County**	**Size**	**Lbs./Capita**	**County**	**Size**	**Lbs./Capita**
Klickitat	<50K	5.96	Cowlitz	50K-100K	9.46	Island	50K-100K	6.04
Pend Oreille	<50K	4.78	Pend Oreille	<50K	7.16	Whatcom	>100K	5.25
Benton	>100K	3.97	Mason	<50K	6.26	San Juan	<50K	4.69
Yakima	>100K	3.82	King	>100K	4.65	Yakima	>100K	4.46
Kittitas	<50K	3.61	Whatcom	>100K	4.62	Skagit	>100K	4.24

MRW Collected

As shown in Table 7.3, Washington collected over 13.5 million pounds of HHW, almost 9.2 million pounds of used oil (UO) from collection sites, and over 1.4 million pounds of CESQG waste, for a total of over 24.3 million pounds of MRW collected during 2002. This is a decrease from 2001, however, CESQG collection has increased significantly.

Table 7.3
Total Pounds per Waste Category for Years 1998 - 2002

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

Collection by Waste Category and Type

As shown in Table 7.4, the dominant types of HHW collected in 2002 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 22.7 million pounds of HHW collected in 2002. These are the same top five HHW types as in 1998, 1999, 2000, and 2001.

Table 7.4
HHW Dominant Waste Types Collected in 2002

Waste Type	Total lbs.
Oil Non-Contaminated	11,019,344
Latex Paint	3,541,175
Oil Based Paint	2,593,203
Lead Acid Batteries	2,262,305
Flammable Liquids	1,232,511
Total	**20,648,538**

Table 7.5 provides summary information on total pounds collected in all three categories of MRW by waste types.

Table 7.5
Total Pounds of MRW Collected by Waste Category

Waste Type	HHW	CESQG	UO Sites
Acids	136,823	15,810	
Lead Acid Batteries	2,262,305	60,582	
Antifreeze	344,067	140,024	259,054
Bases	87,362	20,182	
Bases, aerosols	2,232	2	
Electronic	27,602	50	
CRT's	20,248	1,692	
Chlorinated Solvents	8,406	3,030	
N/NIMH. Lith	16,531	3,052	
Dry Cell Batteries	185,568	6,411	
Flammable Solids	25,953	4,970	
Flammable Liquids	1,232,511	203,898	
Flammable Liquids, aerosols	103,333	3,785	
Flammable Liquids Poison	62,833	7,800	
Flammable Liq. Pois., aerosols	18,217	545	
Flammable Gas	279,828	1,514	
Flammable Gas Poison	546	1	
Flammable Gas Pois., aerosols	14,686	489	
Latex Paint	2,684,987	113,057	
Latex Paint, Contaminated	856,188	2,845	
Oil-Based Paint	2,593,203	257,481	
Oil Contaminated	212,465	4,116	
Oil Filters	71,886	44,110	42,450
Oil Filters Crushed	7,600		
Oil Non-Contaminated	1,840,517	423,403	9,178,827
Oil with Chlorides	93	9,263	
Oil with PCBs	3,726	767	
Other Dangerous Waste	44,922	38,410	
Organic Peroxides	1,83	65	
Oxidizers	23,239	2,242	
Mercury.	908	488	
Pesticide/Poison Liq	276,801	9,244	
Pesticide/Poison Sol	77,071	4,050	
MRW TOTAL	**13,513,356**	**1,395,950**	**9,480,331**

Map E 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.

Map E: MRW Facilities as of 2002

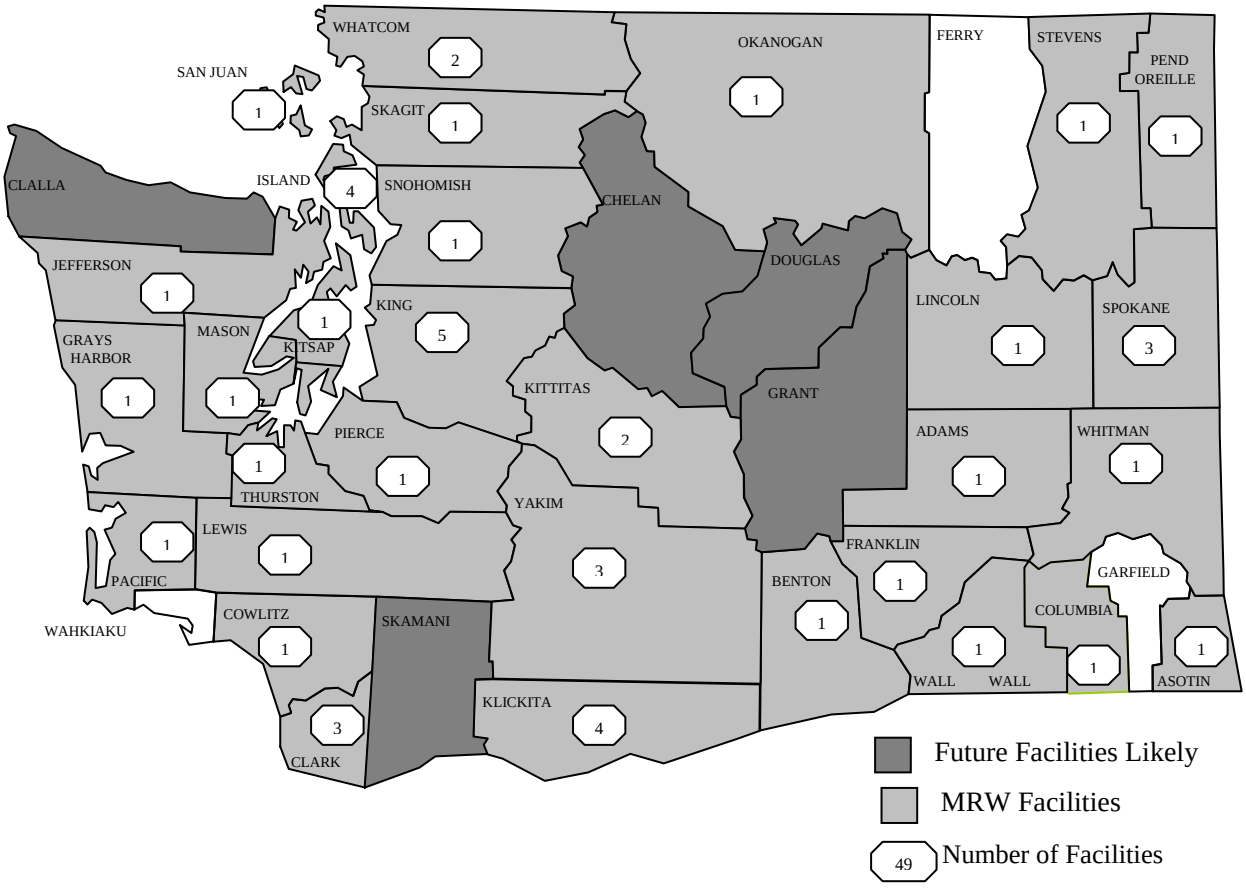


Table 7.6 (next page) shows various data by county. This information can be used to evaluate efficiencies within each county by comparing costs per participant and percentage of participants per housing units*.

Table 7.6
Various Data by County

COUNTY	HOUSING UNITS	HHW Participants	% Participant /Housing Unit	HHW Cost /Participant	HHW lbs. /Participant	HHW Total lbs.	MRW & Used Oil - Total lbs.
Adams	6,020	**P N R**		**C N R**		11,323	216,895
Asotin*	9,311	926	9.9%	$29.36	28.35	26,255	26,255
Benton	59,745	7,390	12.4%	$42.86	61.28	452,869	505,419
Chelan	31,429	735	2.3%	$16.29	103.57	76,126	130,681
Clallam	31,976	**P N R**		**C N R**		49,341	202,157
Clark	146,072	3,413	2.3%	$76.93	300.27	1,024,826	1,707,150
Columbia	2,096	285	13.6%	**C N R**	44.22	12,604	84,872
Cowlitz*	40,157	1,271	3.2%	$84.17	169.16	215,003	267,781
Douglas	13,517	476	3.5%	$53.97	76.95	36,628	128,920
Ferry	3,919	**P N R**		**C N R**		0	500
Franklin	17,776	**P N R**		**C N R**		5,627	153,183
Garfield	1,296	4	0.3%		31.25	125	125
Grant	30,418	509	1.7%	$113.69	116.37	59,234	114,549
Grays Harbor	33,211	1,430	4.3%	$109.50	74	105,829	256,978
Island	34,452	3,434	10%	$45.74	128.6	441,658	471,258
Jefferson	14,965	1,542	10.3%	$42.72	46.93	72,372	150,711
King*	494,530	22,525	4.6%	$160.60	92.57	2,085,136	4,514,889
Seattle	280,883	15,867	5.6%	$80.89	80.81	1,282,250	1,282,250
Kitsap	96,635	5,227	5.4%	$117.91	117.21	612,660	1,018,358
Kittitas	16,475	**P N R**		**C N R**		92,156	218,185
Klickitat	8,633	**P N R**		**C N R**		75,655	124,266
Lewis	29,585	1396	4.5%	$62.47	69.09	96,453	268,577
Lincoln	5,298	**P N R**		**C N R**		1,000	1,000
Mason	25,515	3,582	13.3%	$27.80	26.24	93,988	239,354
Okanogan	19,085	**P N R**		**C N R**			**Q N R**
Pacific	13,991	467	3.3%	**C N R**	90.7	42,358	122,352
Pend Oreille	6,608	1,674	24.1%	$29.69	28.48	47,682	84,801
Pierce	277,060	11,632	4%	$27.36	27.74	322,673	654,968
San Juan	9,752	150	1.4%	$196.57	456.28	68,411	115,751
Skagit	42,681	2098	4.7%	$36.62	212.23	445,265	633,225
Skamania	4,576	128	2.7%	**C N R**	96.19	12,312	51,352
Snohomish	236,205	1,426	0.6%	$528.58	1,617.51	2,306,816	3,716,271
Spokane	175,005	39,969	22.2%	$17.92	25.99	1,038,635	1,716,904
Stevens	17,599	557	3%	$61.92	113.23	63,068	227,237
Thurston	86,652	7,593	8.3%	$54.46	29.59	213,065	657,329
Wahkiakum	1,869	31	1.7	$25.55	75.45	2,339	4,747
Walla Walla*****	21,671	1,856	8.6%	$75.84	33.75	62,648	133,369
Whatcom	73,893	5,102	6.5%	$39.20	177.09	903,499	986,699
Whitman	16,676	492	8.6%	$76.38	106.12	52,209	72,137
Yakima	79,174	2,894	3.5%	$22.90	346.95	1,004,066	1,731,536
Statewide	N/A	155,473	N/A	N/A	N/A	13,514,196	22,693,023

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

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

CESQG

There are 20 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, and Yakima.

Also included in CESQG waste totals for year 2002 is data from Philip Services. Philip Services primarily serves CESQG's in three counties: King, Pierce and Clark. The top five counties that collected the most CESQG material per capita were Kittitas, Yakima, Skamania, Grays Harbor, and Whatcom Counties. Yakima County collected almost 44% of the total statewide volume of CESQG waste.

As shown in Table7.7 the three dominant types of CESQG waste collected in 2002 were non-contaminated oil, oil based paint and flammable liquids. These three specific waste types accounted for 65% of the 1.4 million pounds of CESQG waste collected in 2002.

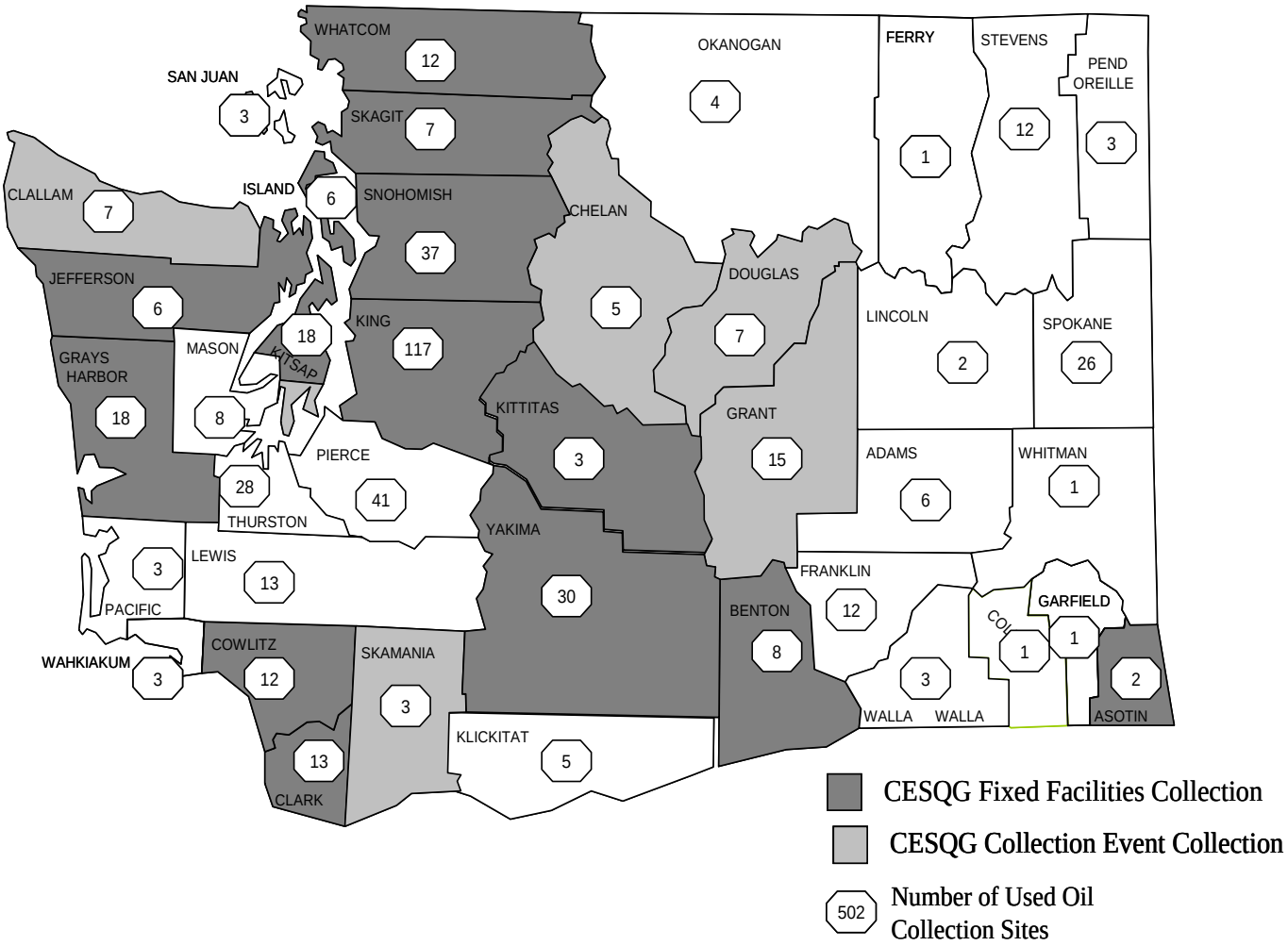
Table 7.7
CESQG by Waste Type Collected in 2002

Waste Type	Total lbs.
Oil Non-Contaminated	423,403
Oil based Paint	257,481
Flammable Liquids	203,898
Antifreeze	140,024
Latex Paint	115,902
Lead Acid Batteries	60,582
All other types	59,056
Oil Filters	44110
Bases	20,182
Acids	15,810
Oil w/Chlorides	9,263
Pesticide/Poison Liq.	9,244

Waste Type	Total lbs.
	7,800
Dry Cell Batteries	6,411
Used Oil, Contaminated	4,116
Pesticide/Poison Sol	4,050
Flam. Liq. Aerosols	3,785
N/NIMH/Lith Batteries	3,052
Chlorinated Solvents	3,030
Oxidizers	2,242
Electronic/CRT's	1,742
Oils, PCBs	767
TOTALS	**1,395,950**

Figure 7.4 shows counties that have fixed facilities for CESQG collection, counties that use collection events for CESQG collection, counties that have no CESQG collection program, and figure 8.5 also shows the number of used oil collection sites by county.

Figure 7.3
CESQG Waste Collection and Used Oil Collection Sites as of 2002



Used Oil Sites

In 2002, reported used oil collection sites yielded 9,178,827 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 (next page) for the six highest collections in pounds per capita by county size for 2000, 2001, and 2002.

Table 7.8
Used Oil Sites, High Collection Counties, and pounds per capita by county size

Used Oil Sites - 2000			Used Oil Sites - 2001			Used Oil Sites - 2002		
County	**Size**	**Lbs./Capita**	**County**	**Size**	**Lbs./Capita**	**County**	**Size**	**Lbs./Capita**
Stevens	<50K	3.9	Mason	<50K	4.0	Columbia	<50K	17.6
Cowlitz	50K-100K	3.7	Stevens	<50K	4.0	Adams	<50K	12.3
Pacific	<50K	3.6	King	>100K	3.9	Stevens	<50K	4.0
Douglas	<50K	2.9	Cowlitz	50K-100K	3.5	Skamania	<50K	3.9
Lewis	50K-100K	2.8	Skamania	<50K	3.2	Pacific	<50K	3.8
Franklin	<50K	2.7	San Juan	<50K	3.0	Kittitas	50K-100K	3.6

Statewide Level of Service

The US Census Bureau reports that as of 2002 there were an estimated 2,516,411 Housing Units47 in Washington State. MRW Annual Reports revealed there were 155,473 participants in HHW collection in 2002 excluding numbers for Okanogan County because this information was not provided. 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, the number of households served can be estimated by adding ten percent to the participant values for an estimated 171,020 households served in 2002. This number represents 6.8% of all households in Washington State. This is an increase from the 6.1% of 2001 but a slight decrease from 2000 and 2001 when an estimated 7.8% and 6.6% respectively of Washington households were served.

Trends in Collection

As fixed facilities continue to gain popularity, the 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. This supports an increase in the collection numbers for CESQG waste.

47 This information was downloaded from Website http://www.ofm.wa.gov/pop/poptrends/poptrends_03.pdf

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). Since this waste stream is just beginning in 2002, we expect this waste stream to more than double within the next three or four years.

References - Chapter 7

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APPENDIX A
STATE MAP WITH COUNTY NAMES

State Map with County Names

APPENDIX B
WASHINGTON STATE RECYCLING DATA
1986 – 2002

Table B.1
Washington State Recycling Rate 1986 to 2002

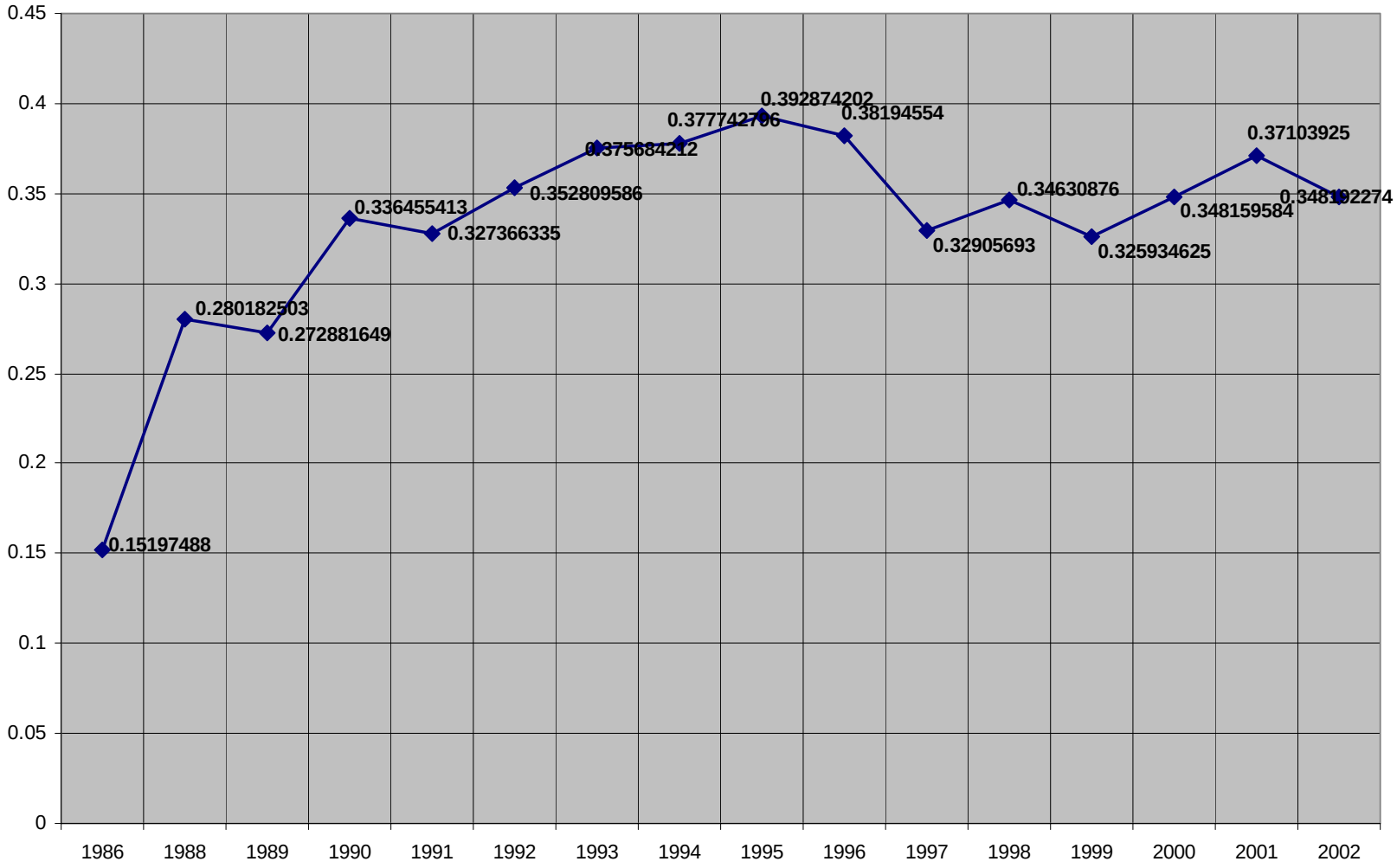

Table B.2
Commodity Summary

Commodity	1986	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Newspaper	97291	191100	160600	153427	169239	219227	208603	209415	286984	298616	187044	200447.6087	168832.4343	219715.57	176392.09	187585.08
Corrugated Paper	196451	302900	272820	272559	346657	468317	329670	382996	480198	639291	392314	344885.5756	478074.1927	495469.66	491230.43	417533.5
High Grade	59487	65300	53600	66758	100359	79574	81037	61931	50416	80203	56245	69435.55383	61212.09378	59976.24	58537.5	62311.64
Mixed Waste Paper	38765	65600	64100	77837	100473	160211	193386	173055	278371	260883	194201	207225.0813	253428.0466	273493.63	231302.4	206051.12
Aluminum Cans	8696	13900	18110	21506	24983	18732	18136	16375	21213	19064	19601	12716.00101	14357.17299	17944.5	12539.76	12718.21
Tin Cans	752	1600	2720	11895	13170	16720	17256	18519	13223	12786	15149	13003.37098	12339.60699	22631.93	11483.1	9417.13
Ferrous Metals	0	630900	672080	865358	627165	662818	756042	772295	691843	220667	300068	225372.5707	241367.0264	357220	254104.19	432778.25
Nonferrous Metals	80	54400	68590	77907	82536	57284	71079	99827	31559	75926	45568	55384.61807	30956.26005	51273.4	41615.18	61240.23
White Goods	0	7700	26720	55464	15375	126540	112418	10304	14051	14358	15126	12233.46998	28524.49003	35427	39180.28	43832.59
Refillable Beer Bottles	29480	19600	27530	2893	2927	492	432	573	3278	2579	633	261.199995	63	0	0	0
Container Glass	18533	25600	33290	42289	50659	55629	66283	64980	77108	73197	79566	113076.9031	58517.47743	84061.93	81632.35	64936.64
PET Bottles	0	200	220	606	1263	1762	1982	3502	4955	3853	4965	3031.486994	2910.513498	5099.51	4661.45	5885.91
LDPE Plastics	0	600	60	469	391	6210	1275	6087	634	2135	1693	1341.5	2225.489999	4032.17	6603.43	9775.15
HDPE Plastics	0	600	190	533	525	2437	3117	7827	5250	4033	3835	3889.095994	3253.432494	5491.07	4841.28	6029.43
Other Recyclable Plastics	349	600	120	3756	5256	396	5075	11693	2542	1642	13945	1608.605003	3971.240018	6512.3	4067.44	949.27
Vehicle Batteries	0	33100	33280	26381	28485	19604	14975	19128	18331	16365	15294	7738.330062	15142.13485	10756.6	16296.75	12158.08
Tires	0	20000	13400	1779	15448	12784	31248	53119	6575	7043	5520	2106.4	1514	12218.4	10305.89	27102.05
Used Oil	2.8	1731	1541	1140	40600	1845	1835	2050	961	6141	7299	41162.35509	6352	8353	38288.32	43367.24
Yard Waste	0	0	64090	96550	144511	157673	320821	319232	295915	337534	384848	608127.7411	525454.0732	450761.4	448221.53	380882.21
Food Waste	0	0	0	74077	53284	38624	69996	126409	78148	103073	75020	92391.51001	72646.2002	73894.9	193023.57	70903.79
Wood Waste	0	0	1320	18485	23956	30181	77116	93318	192056	223828	265887	115289.2908	142786.59	215211.3	538242.32	394261.28
Textiles (Rags, clothing, etc.)	0	0	6750	10366	8755	10061	15360	12440	13022	9186	11046	3979.497986	12524.57009	15961	10126.75	9440.01
Gypsum	0	0	0	7422	12681	3605	34177	27598	1216	50202	56373	31062.18002	29896.63	36692	29883.48	51089.03
Photographic Films	0	0	0	12	21	9	468	23	20	3	22	0	81	6	87.24	516.77
Computers & Parts	0	0	0	0	0	0	0	0	0	0	0	0	9	255	317.19	1414.37
Fluorescent light bulbs	0	0	0	0	0	0	0	0	0	0	0	0	167	160	345.98	417
Porcelain toilets	0	0	0	0	0	0	0	0	0	0	0	0	1.909999967	0	0	0
Other Rubber Materials	0	0	0	0	0	0	0	0	0	0	0	0	0	55	373.6	165.59
Asceptic Packaging	0	0	0	0	0	0	0	0	0	0	0	0	0	98	68.79	25.96
Total Tons Recycled	449886.8	1435431	1521131	1889469	1868719	2150735	2431787	2492696	2567869	2462608	2151262	2165769.946	2166607.586	2462771.51	2703772.29	2512787.53
Total Tons Disposed	2510384	3687769	4053194	3726339	3839623	3945287	4041168	4106228	3968241	3984929	4386397	4088100	4480761	4610914.3	4611406	4703879
Total Tons Generated	2960270.8	5123200	5574325	5615808	5708342	6096022	6472955	6598924	6536110	6447537	6537659	6253869.946	6647368.586	7073685.81	7315178.29	7216666.53
Recycling Rate	0.15197488	0.280182503	0.272881649	0.336455413	0.327366335	0.352809586	0.375684212	0.377742796	0.392874202	0.38194554	0.32905693	0.34630876	0.325934625	0.348159584	0.369611263	0.348192274
Population (rounded to nearest hundred)	4462200	4616900	4728100	4866700	5021300	5141200	5265700	5364300	5470100	5567800	5663800	5750000	5830800	5894100	5974900	6041700
Disposed pounds/day/person	3.082678671	4.376736214	4.69729536	4.195511515	4.189956811	4.204857029	4.20521228	4.194373814	3.975025375	3.92169751	4.24362655	3.895747469	4.210762686	4.286538036	4.229021085	4.266130303
Recycled pounds/day/person	0.552447929	1.703605307	1.762857043	2.127366551	2.039224138	2.292237088	2.53050122	2.546205138	2.572259203	2.423532179	2.081241743	2.063866536	2.036053781	2.289516366	2.479571312	2.278944468
Generation pounds/day/person	3.635126601	6.080341521	6.460152403	6.322878066	6.229180949	6.497094117	6.7357135	6.740578952	6.547284578	6.345229689	6.324868294	5.959614005	6.246816467	6.576054401	6.708592397	6.545074771

APPENDIX C
FACILITY SPECIFIC DISPOSAL DATA FOR 2002

Table C.1
2002 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	39,935	0	0	0	0	0	0	0	0	0	0.00	0	**39,935**
Cedar Hills	King	934,777	0	870	0	0	0	0	72	16	0	0.00	3185	**939,487**
Cheyne Road	Yakima	62,339	0	0	0	0	0	0	0	0	0	0.00	0	**62,339**
Cowlitz County - B	Cowlitz	48,029	4,140	4,962	0	25,669	0	0	6	0	0	0.00	0	**82,806**
Delano	Grant	3,786	1,500	0	813	525	0	0	0	0	1	0.00	0	**6,625**
Ephrata	Grant	72,656	0	2,604	0	0	0	0	3	0	78	0.00	190	**75,531**
Fort Lewis #5	Pierce	0	0	0	2,101	0	0	0	0	77	0	0.00	0	**2,178**
Greater Wenatchee Reg. Landfill	Douglas	123,093	0	0	0	0	0	961	77	4,055	267	0.00	2576	**131,029**
Horn Rapids Landfill	Benton	21,840	10,274	737	1,229	22,603	1,658	743	0	10	32	0.00	301	**59,427**
LRI Landfill (304th Street)	Pierce	388,092	14,320	0	0	36,581	4	0	340	151,477	0	316.00	94442	**685,572**
New Waste Inc. Landfill (closed 02)	Franklin	338	6	0	280	2,552	8	58	13	92	14	0.00	253	**3,614**
Northside	Spokane	5,695	10,167	0	0	0	0	0	0	0	0	0.00	0	**15,862**
Okanogan Central	Okanogan	22,579	6	0	0	0	9	0	1	0	6	0.00	44	**22,645**
Olympic View Landfill (stopped MSW 7/02)	Kitsap	103,451	56,329	0	12,669	0	0	0	576	169,814	12	0.00	2645	**345,496**
Port Angeles	Clallam	35,377	6,437	0	0	9,538	0	0	0	5,534	0	0.00	0	**56,886**
Roosevelt	Klickitat	1,319,987	275,485	164,566	0	0	53,361	0	3,032	125,986	4,823	0.00	0	**1,947,240**
Stevens County	Stevens	22,722	741	5,319	0	1,580	109	0	0	0	392	0.00	0	**30,863**
Sudbury Road	Walla Walla	56,391	0	0	0	0	0	0	122	0	34	56.00	0	**56,603**
Tacoma, City of	Pierce	22,451	0	0	0	0	0	0	30	0	117	0.00	0	**22,598**
Terrace Heights	Yakima	157,189	0	0	0	0	0	0	636	0	0	0.00	0	**157,825**
		3,440,727	**379,405**	**179,058**	**17,092**	**99,048**	**55,149**	**1,762**	**4,908**	**457,061**	**5,776**	**372**	**104,203**	**4,744,561**

Table C.2
2002 Total Waste Disposed Energy Recovery/Incinerators

Facility Name	MSW	Demo	Ind	Inert	Comm	Wood	Sludge	Biomedical	Tires	Special	Other	Total
City of Tacoma Steam Plant (inactive02)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
Inland Empire Paper	0.00	0.00	0.00	0.00	0.00	10,161.00	0.00	0.00	0.00			0.00
Ponderay Newsprint Co.	0.00	0.00	15,473.00	0.00	0.00	11,334.00	0.00	0.00	0.00			0.00
Spokane Regional Waste to Energy Facility	274,506.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
	274,506.00	**0.00**	**15,473.00**	**0.00**	**0.00**	**21,495.00**	**0.00**	**0.00**	**0.00**			**0.00**

Table C.3
2002 Total Waste Disposed Inert/Demolition Waste Landfills

Facility	Demo	Ind	Inert	Comm	Wood Wst	Sludge	Asbestos	PCS	Tires	Total Waste
Adams Street Inert Waste Disposal	0.00	0.00	1,294.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,294.00**
ALCOA Inert Waste/Demolition	0.00	0.00	472.00	0.00	0.00	0.00	6.00	0.00	0.00	**478.00**
Anderson Demolition Site	38,922.00	0.00	3,439.00	0.00	0.00	0.00	0.00	436.00	0.00	**42,797.00**
Asotin County I & D Landfill	2,194.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,194.00**
Asphalt & Gravel Products, Inc.	8,641.00	0.00	2,069.00	0.00	0.00	0.00	0.00	0.00	0.00	**10,710.00**
Box Canyon Site	0.00	0.00	10,975.00	0.00	0.00	0.00	0.00	0.00	0.00	**10,975.00**
Busy Bee Landfill	4,500.00	0.00	3,004.00	0.00	0.00	0.00	0.00	0.00	0.00	**7,504.00**
Caton Inert & Demo Landfill	6,070.00	0.00	2,483.00	0.00	445.00	0.00	0.00	0.00	0.00	**8,998.00**
Central Pre-Mix Site (Fort Wright)										
Chester Landfill	19,599.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**19,599.00**
Christian Inert Waste Landfill										
City of Kennewick Inert/Demo	0.00	0.00	2,513.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,513.00**
City of Palouse Inert/Demo										
Clark Inert Landfill	0.00	0.00	125.00	0.00	0.00	0.00	0.00	0.00	0.00	**125.00**
County Construction Recyclers,	45,764.00	0.00	695.00	0.00	0.00	0.00	0.00	0.00	0.00	**46,459.00**
Coupeville Demolition LF	0.00	0.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	**483.00**
Douglas County Lux	0.00	0.00	3,925.00	0.00	0.00	0.00	0.00	0.00	0.00	**3,925.00**
Fillion Inert/Demo Site	690.00	0.00	2,688.00	0.00	0.00	0.00	0.00	0.00	0.00	**3,378.00**
Humbert Demolition Landfill	0.00	0.00	2,893.00	0.00	0.00	0.00	0.00	0.00	0.00	**2,893.00**
Indian Island CDL Landfill	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**36.00**
Inland Asphalt Landfill	0.00	0.00	27,500.00	0.00	0.00	0.00	0.00	0.00	0.00	**27,500.00**
Inland Crestline Recycling	0.00	0.00	37,500.00	0.00	0.00	0.00	0.00	0.00	0.00	**37,500.00**
Kaiser-Mead Inert & Demolition	160.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**160.00**
Kittitas County Inert & Demo	1,559.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,559.00**
McChord Inert Waste Landfill	0.00	0.00	1,918.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,918.00**
Pipkin/Handley Landfill	2,768.00	0.00	6,268.00	0.00	0.00	0.00	0.00	0.00	0.00	**9,036.00**
Prosser Inert/Demo Landfill	8.00	0.00	453.00	0.00	0.00	0.00	0.00	0.00	0.00	**461.00**
Rinker Materials	98,285.00	0.00	0.00	0.00	0.00	0.00	0.00	119,723.00	0.00	**218,008.00**
TransAlta Centralia Mining LLC	0.00	0.00	354.00	0.00	0.00	0.00	0.00	0.00	257.00	**611.00**
Whitman College (Spokane Rock Pro)	14,397.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**14,397.00**
Yakima Training Center Inert/Demo	0.00	0.00	1,406.00	0.00	0.00	0.00	0.00	0.00	0.00	**1,406.00**
	243,593	**0.00**	**112,457**	**0.00**	**445**	**0.00**	**6**	**120,159**	**257**	**476,917**

Table C.4
2002 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											
Purpose Landfill											
Dickson - CDL - So 50th & Tyler St	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**900.00**
Dickson -East 48th & Waller Road	0.00	0.00	188,037.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**188,037.00**
Fill Site											
Graham Road Recycling & Disp	52,711.00	3,444.00	0.00	0.00	0.00	0.00	1,278.00	8,101.00	59.00	14402	**79,995.00**
Intalco Aluminum Corp	2,017.00	2,879.00	1,788.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**6,684.00**
Kettle Falls Generating Station Wood Ash	0.00	19,576.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**19,576.00**
Lady Island Limited Purpose Landfill	0.00	0.00	4,578.00	0.00	2,708.00	0.00	0.00	0.00	0.00	0	**7,286.00**
Lawson Limited Purpose Site	0.00	21,795.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**21,795.00**
Port Townsend Paper	0.00	9,078.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	**9,078.00**
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**
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	42,418.00	217,310.00	0.00	0.00	39.00	0.00	0.00	1,406.00	0.00	0	**261,173.00**
Whitman Co. Limited Purpose Landfill	1,681.00	0.00	0.00	0.00	0.00	0.00	33.00	0.00	0.00	0	**1,714.00**
	98,827	**275,348**	**195,303**	**0.00**	**2,747**	**0.00**	**1,311**	**9,507**	**59**	**14,402**	**597,504**

Table C.5
2002 Total Waste Disposed for Woodwaste Landfills

Facility Name	Demolition	Industrial	Inert Wst	Comm'l	Wood Wst	Sludge	Asbestos	PCS	Tires	Total Waste
Stafford Creek Woodwaste Landfill	21,275	0	0	0	11,896	0	0	0	0	**33,171**
	21,275	**0**	**0**	**0**	**11,896**	**0**	**0**	**0**	**0**	**33,171**

Table C.6
2002 Total Waste Composted

Company	*County*	*Yard waste*	*Wood*	*Sawdust*	*Biosolids*	*Vegetative*	*Manure*	*Post Consumer*	*Other*	*Total Waste*
Bailand Farms YW Composting	Snohomish	16,000.00	0.00	0.00	0.00	0.00	8,000.00	0.00	0.00	***24,000.00***
Cedar Grove Composting, Inc.	King	150,950.00	3,000.00	0.00	0.00	12,100.00	0.00	809.00	0.00	***166,859.00***
City of Cheney - Wastewater Division	Spokane	2,240.75	1,400.00	0.00	242.80	0.00	0.00	0.00	0.00	***3,883.55***
City of Port Townsend	Jefferson	4,198.06	0.00	0.00	213.72	0.00	0.00	0.00	0.00	***4,411.78***
City of Quincy	Grant	1,463.55	33.00	0.00	0.00	0.00	0.00	0.00	0.00	***1,496.55***
City of Spokane	Spokane	674.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***674.00***
Columbia Compost	Walla Walla	2,216.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***2,216.00***
Columbia Compost	Columbia	200.00	0.00	0.00	90.00	0.00	0.00	0.00	0.00	***290.00***
Cowlitz County Public Works	Cowlitz	1,786.00	4,284.00	0.00	2,000.00	0.00	0.00	0.00	0.00	***8,070.00***
Dykstra Composting Facility	Skagit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	485.00	***485.00***
GROCO	King	0.00	0.00	14,250.00	11,300.00	0.00	0.00	0.00	0.00	***25,550.00***
Hi Q Compost Facility	Skagit	0.00	0.00	0.00	0.00	0.00	1,282.90	0.00	0.00	***1,282.90***
Hilltop Emu Ranch	Kitsap	1.00	100.00	0.00	0.00	0.00	50.00	0.00	0.00	***151.00***
LaConner, Town of WWTP	Skagit	90.00	0.00	990.00	185.00	0.00	0.00	0.00	0.00	***1,265.00***
Lamb-Weston, Inc.	Franklin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	832.00	***832.00***
Langley City Water and Wastewater Srv.	Island	240.00	0.00	0.00	196.00	0.00	0.00	0.00	0.00	***436.00***
Lord Hill Compost Facility	Snohomish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***0.00***
LRI - Purdy Facility	Pierce	21,582.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***21,582.48***
Lynden, City of WWTP	Whatcom	130.00	875.00	787.50	312.00	0.00	0.00	0.00	0.00	***2,104.50***
Miller Creek Compost Facility	King	0.00	264.00	0.00	278.00	0.00	0.00	0.00	0.00	***542.00***
Natural Selection Farms, Inc.	Yakima	300.00	0.00	0.00	2,700.00	0.00	1,200.00	0.00	10,000.00	***14,200.00***
Pacific Topsoils	Snohomish	54,764.00	21,094.00	0.00	0.00	870.00	5,506.00	0.00	12,309.00	***94,543.00***
Pierce County Recycling Composting	Pierce	45,225.10	2,463.17	0.00	0.00	0.00	0.00	0.00	0.00	***47,688.27***
Skagit Soils	Skagit	11,814.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***11,814.00***
Soil Life Systems, Inc	Walla Walla	0.00	0.00	0.00	0.00	0.00	6,041.00	0.00	18,571.00	***24,612.00***

Company	*County*	*Yard waste*	*Wood*	*Sawdust*	*Biosolids*	*Vegetative*	*Manure*	*Post Consumer*	*Other*	*Total Waste*
Soos Creek Organics, Inc.	King	25,307.00	3,590.00	120.00	0.00	2,072.00	549.00	0.00	11,244.00	***42,882.00***
South Sound Soils, LLC	Thurston	0.00	12,036.00	560.00	9,294.00	0.00	60.00	0.00	0.00	***21,950.00***
Thurston County Water & Waste Management	Thurston	9,997.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***9,997.60***
WADOC	Jefferson	0.00	120.00	2.00	300.00	113.30	0.00	113.30	15.00	***663.60***
Washington State University	Whitman	25.00	270.50	0.00	0.00	33.03	7,484.50	132.12	3,993.90	***11,939.05***
West Van Materials Recovery Facility	Clark	3,470.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***3,470.88***
Wilcox Farms, Inc.	Pierce	0.00	27,007.00	0.00	0.00	0.00	10,803.00	0.00	0.00	***37,810.00***
Totals		***352,675.42***	***76,536.67***	***16,709.50***	***27,111.52***	***15,188.33***	***40,976.40***	***1,054.42***	***57,449.90***	***587,702.16***

APPENDIX D
DISPOSAL DATA SUMMARIES
1992 - 2002

Table D.1
Waste Types Reported Disposed in MSW Landfills 1992-2002

WASTE TYPES	1992 (Tons)	1993 (Tons)	1994 (Tons)	1995 (Tons)	1996 (Tons)	1997 (Tons)	1998 (Tons)	1999 (Tons)	2000 (Tons)	2001 (Tons)	2002 (Tons)
Municipal Solid Waste*	2,694,800	2,641,551	2,725,084	2,777,030	2,807,998	3,083,286	3,222,639	3,421,415	3,336,745	3,432,359	3,440,727
Demolition Waste	250,144	331,231	459,979	382,513	375,412	385,412	446,172	437,005	569,239	373,254	379,405
Industrial Waste	101,607	44,471	150,218	161,779	145,617	163,431	159,781	232,905	88,841	201,198	179,058
Inert Waste	1,027	0	31,248	5,154	30,061	117,512	107,452	23,875	19,349	26,376	17,092
Commercial Waste	143,466	180,691	92,498	142,258	109,093	173,863	158,256	129,070	93,752	66,391	99,048
Woodwaste	60,523	98,595	22,668	37,850	57,667	57,128	60,383	68,889	47,087	34,254	55,149
Sewage Sludge	64,311	33,854	64,364	66,728	49,205	72,741	67,419	62,920	47,783	1,473	1,762
Asbestos	8,247	7,076	11,819	7,859	7,965	9,558	10,684	9,666	7,922	5,991	4,908
Petroleum Contaminated Soils	224,560	273,429	249,552	255,288	254,414	444,260	288,407	312,247	231,290	217,721	457,061
Tires	na	1,288	1,815	28,712	12,787	14,912	19,130	12,581	43,188	8,567	5,776
Special	na	na	Na	na	10	6	904	0	437	917	567
	na	na	na	na	na	na	na	na	239	387	372
Other**	12,053	113,869	69,371	136,644	233,526	10,809	40,880	28,235	173,711	156,131	103,636
TOTAL	3,560,738	3,726,055	3,878,615	4,001,815	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561

* 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.

Table D.2
Waste Types and Amount Disposed at Inert/Demolition Landfills 1992-2002

WASTE TYPES	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Municipal	0	0	0	0	0	0	0	0	0	0	0
Demolition	750,627	168,066	157,758	103,903	133,469	262,793	180,268	173,088	259,255	211,901	243,593
Industrial	0	0	0	0	0	121	0	0	0	0	0
Inert	139,366	272,047	200,172	121,943	226,362	326,331	252,506	344,444	180,337	199,256	112,457
Commercial	0	0	0	0	0	0	0	0	0	0	0
Wood	609	120	0	167	39	0	156	336	536	167	445
Sludge	0	0	0	0	0	0	0	0	0	0	0
Asbestos	0	12	4	0	0	0	4	0	3	3	6
PCS	0	16,233	19,179	18,295	846	10,285	60,545	17,265	34,742	319,105	120,159
Tires	0	500	0	0	33	618	449	414	471	765	257
Other	14,486	2,260	740	33,125	58,953	1	600	605	2,039	2,646	0
TOTAL (tons)	905,088	459,238	377,853	277,433	419,702	600,149	494,528	536,155	477,383	733,843	476,917

Table D.3
Waste Types and Amount Disposed at Limited Purpose Landfills 1992-2002

WASTE TYPES	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Municipal	0	0	0	0	0	0	0	0	0	0	0
Demolition	13,698	12,894	95,568	151,230	180,529	85,916	98,072	84,140	71,203	71,817	98,827
Industrial	194,689	17,680	212,008	315,930	371,496	277,419	225,779	262,021	278,224	325,114	282,747
Inert	44,572	37,274	104,419	138,577	141,759	109,174	112,714	136,352	205,902	202,577	195,303
Commercial	0	25,019	0	0	0	0	0	0	0	0	0
Wood	94,541	156,261	86,088	58,628	22,660	14,589	7,700	8,853	3,205	6,841	2,747
Sludge	0	0	21	0	0	2,275	0	1,103	0	0	0
Asbestos	0	0	226	797	512	1,310	1,058	1,549	1,654	1,282	1,311
PCS	0	99,360	82,279	148,932	98,221	121,066	56,407	8,837	7,159	13,222	9,888
Tires	0	0	0	0	29,227	434	559	59	25	41	59
Other	35,615	59,259	60,642	40,797	65,675	83,600	124,607	66,833	79,291	24,698	14,402
TOTAL (tons)	383,115	407,747	642,251	874,116	910,078	695,783	628,896	569,747	646,662	645,592	605,284

Table D.4
Waste Types and Amount Disposed at Woodwaste Landfills 1992-2002

WASTE TYPES	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Municipal	0	0	0	0	0	0	0	0	0	0	0
Demolition	57,328	20,775	0	8,600	18,780	17,718	21,313	25,121	32,182	31,559	21,275
Industrial	0	0	0	0	0	0	0	0	15,120	0	0
Inert	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0
Wood	122,381	96,708	93,310	105,080	81,886	69,498	36,777	75,668	33,452	21,739	11,896
Sludge	0	0	0	0	0	0	0	0	0	0	0
Asbestos	0	0	0	0	0	0	0	0	0	0	0
PCS	0	0	0	0	0	0	0	0	0	0	0
Tires	0	0	0	0	0	0	0	0	0	0	0
Other	1,785	4,614	3,213	2,079	2,031	8,109	1,320	1,695	622	0	0
TOTAL (tons)	181,494	122,097	96,523	115,759	102,697	95,325	59,410	102,484	87,552	53,298	33,171

Table D.5
Per Capita Disposed, Recycled and Generated Numbers
(pounds/person/day)

Per Capita	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Disposed[48]	4.67	4.96	5.07	5.16	5.12	5.16	5.66	5.45	5.73	5.96	5.55	6.74
Recycled	2.05	2.30	2.58	2.56	2.56	2.51	2.10	2.05	2.05	2.33	2.48	4.46
Generated	6.72	7.26	7.65	7.72	7.68	7.67	7.76	7.50	7.78	8.28	8.03	11.20

Table D.6
Total Amounts of Solid Waste Disposed in Washington 1993-2002

DISPOSAL METHOD	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Municipal Solid Waste Landfills	3,726,055	3,878,615	4,001,815	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561
Incinerated Waste	431,928	421,626	397,588	365,464	551,006	369,778	461,684	554,780	496,152	311,474
Woodwaste Landfills	122,097	32,625	115,759	102,697	95,325	59,410	102,484	87,552	53,298	33,171
Inert/Demolition Landfills	834,238	657,614	479,638	873,195	600,149	494,528	536,155	477,383	733,843	476,917
Limited Purpose Landfills	407,747	642,251	874,116	910,078	695,783	628,896	569,747	646,662	645,592	605,284
TOTAL	5,522,065	5,632,731	5,868,916	6,335,189	6,475,181	6,134,719	6,408,878	6,425,959	6,453,904	6,171,407

[48] Disposed amounts include all waste generated from Washington disposed in MSW landfills and incinerators, both instate and exported.

Table D.7
Solid Waste Imported for Disposal 1991-2002

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Municipal Solid Waste	24,475	27,114	26,933	27,330	111,395	203,180	213,322	235,408	243,292	116,365	100,092	112,097
Demolition	1,412	0	147	1,095	6,643	9,904	12,264	14,245	11,529	25,322	4,370	6,104
Industrial	0	0	0	4,269	39,990	39,272	358	28,032	39,547	32,044	57,952	42,953
Inert	0	0	0	0	0	0	0	0	0	0	0	1,097
Woodwaste	208	27,492	24,486	120	1,897	71	0	207	21	21	2	35
Sludge	36	34,457	0	33	0	14	1,413	23	0	0	0	0
Asbestos	0	41	735	206	401	422	39,517	637	478	715	243	350
Petroleum Contaminated Soils	0	12,388	16,698	33,136	54,839	13,706	12,127	19,831	3,652	1,511	4,910	1,769
Tires	0	0	0	0	3,594	7,605	7,895	7,202	2.,228	2,296	1,622	1,162
Medical	na	na	Na	Na	Na	na	1,300	1,432	0	0	0	0
Other	0	0	0	924	210	941	0	828	0	3,131	33	359
TOTAL	26,131	101,492	69,059	67,113	218,970	275,115	288,196	307,850	300,747	191,405	172,696	165,935

Table D.8
Solid Waste Exported from Washington for Disposal 1993-2002

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Municipal Solid Waste	710,515	737,309	709,133	778,107	785,741	801,663	832,421	949,685	915,156	1,001,717
Demolition	2,245	11,130	113,097	137,314	94,905	94,546	92,768	93,540	62,791	99,501
Industrial	864	3,034	6,773	20,949	50,158	57,556	112,735	129,986	115,334	111,284
Inert	0	0	0	0	0	0	0	0	0	38
Woodwaste	0	0	0	0	0	0	0	0	0	0
Sludge	0	2,834	5,212	7,062	0	0	0	0	0	0
Asbestos	1,623	2,709	3,031	2,564	5,440	2,856	3,778	4,439	3,836	5,379
Petroleum Contaminated Soils	22,308	7,555	9,760	29,574	39,112	24,999	62,015	54,787	71,460	199,846
Tires	Na	Na	0	0	0	0	0	0	0	0
Medical	Na	Na	Na	5,209	0	5,204	5,474	6,109	4,868	2,045
Other	18,512	5,943	4,879	8,394	0	0	0	1,939	1,919	5,438
TOTAL	756,067	770,514	851,885	989,173	975,356	986,824	1,109,191	1,240,485	1,175,953	1,425,248