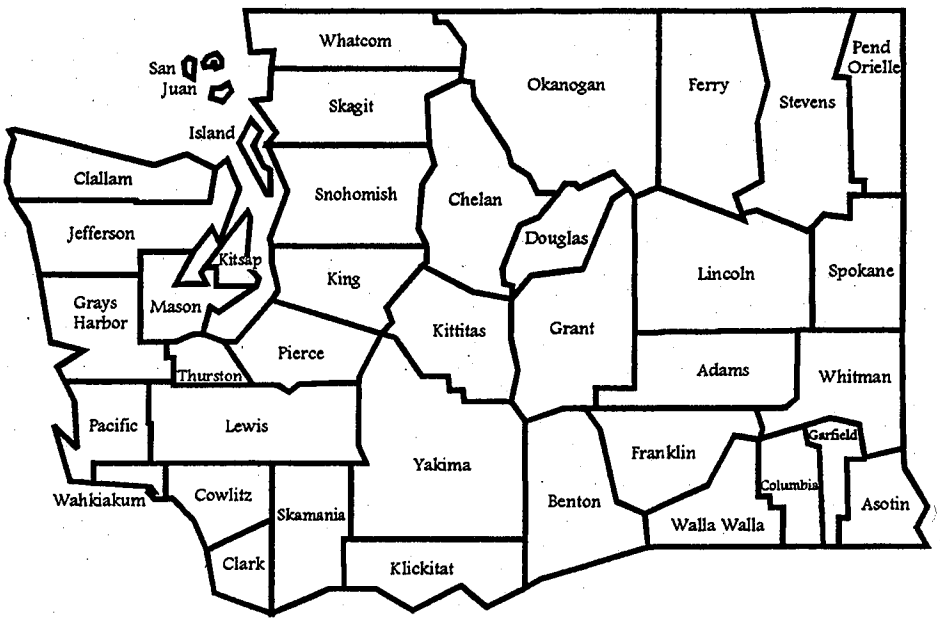

Solid Waste in Washington State

Fourth Annual Status Report
Including the 1994 Recycling Survey

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Solid Waste and Financial Assistance Program
February 1996
Publication #96-500

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Fourth Annual Status Report
Including the 1994 Recycling Survey

Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

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ACRONYMS

BOD	Biochemcial Oxygen Demand
CDL	Construction, Demolition and Landclearing
CESQG	Conditionally Exempt Small Quantity Generator
CPG	Coordinated Prevention Grants
EPA	Environmental Protection Agency
ESHB	Engrossed Substitute House Bill
EYC	Ecology Youth Corps
GA	Department of General Administration
GOLD	Government Options to Landfill Disposal
HDPE	High-density polyethylene
HHW	Household Hazardous Waste
LDPE	Low-density polyethylene
MFS	Minimum Functional Standards
MRW	Moderate Risk Waste
MSW	Municipal Solid Waste
NPDES	National Pollutant Discharge Elimination System
PCS	Petroleum Contaminated Soils
PPG	Public Participation Grants
RA	Remedial Action
RCRA	Resource Recovery and Conservation Act
RCW	Revised Code of Washington
SQG	Small Quantity Generator
WAC	Washington Administrative Code
WR/R	Waste Reduction/Recycling

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EXECUTIVE SUMMARY

This Fourth Annual Status Report updates the status of solid waste facilities, looks at recycling and disposal trends and discusses waste movement within the state, and waste movement in and out of the state In addition, the 1994 Recycling Survey is included in this status report and not as a separate report as in past years. Ecology's efforts in waste reduction, recycling and other solid waste management areas have been refocused because of budget reductions in 1995. Some of the redirections are discussed in this report.

This annual report was compiled from report forms provided by solid waste landfills and incinerators, from surveys completed by recyclers and from information provided by Ecology's headquarters and regional staff in coordination with local jurisdictional health departments. The key findings of this fourth annual report follow.

SUMMARY OF FINDINGS

❖ Solid Waste Handling Infrastructure

In 1994, there were 315 solid waste facilities statewide, including landfills (84), intermediate transfer and storage facilities (222), and incinerators (5). There are an additional 4 facilities classified as ancillary.

In 1994, 36 municipal solid waste (MSW) landfills accepted waste. Of those, 29 were publicly owned, 7 were privately owned. These landfills were in 26 of the 39 Washington counties, compared with 35 counties in 1991. At the end of 1995, only 23 MSW landfills, in 18 counties, remained operating. As MSW landfills continue to close, more counties will be relying on long-haul transport to facilities beyond their borders for disposal.

Of the remaining non-MSW facilities in the landfill classification in 1994, there was one ash monofill, 21 inert/demolition landfills, 15 limited purpose landfills and 11 woodwaste landfills.

❖ Waste Reduction/Recycling

Ecology began evaluating methodologies for local government, business and institutions to use for measuring waste reduction.

In 1994, waste reduction, as well as recycling efforts, continued to focus on the priority waste stream of construction, demolition and landclearing (CDL) debris:

- The Western Washington CDL Recycling Coordinators Group was formed to promote the reduction, recycling and use of recycled-content products in construction projects.

- A compost facility resource handbook is being developed to integrate the regulatory requirements, facility designs and best management practices for compost facilities.

❖ 1994 Recycling Survey

In 1994, 2,492,697 tons of the recyclable portion of the solid waste stream were recycled. This represents a measured 38% recycling rate for the recyclable waste stream generated in 1994.[1] This is the same as 1993. Although, this is still below the target goal of 50% recycling by 1995, several commodities had higher individual rates:

Corrugated Paper	74%	Newspaper	74%
Non-Ferrous Metals	74%	Ferrous Metals	73%
High Grade Paper	62%	Yard Waste	59%

The state has also made gains in recycling other commodities that are not adequately measured in the recycling survey. These include woodwaste, some organic materials, and construction and demolition debris. Future changes in the recycling survey will better measure these materials.

In 1995, the methodology for the recycling survey will change. Ecology, with the help of the Washington State Recycling Association (WSRA), convened a group of interested parties to assess the current survey and look at ways to improve it. The group was made up of representatives from recycling businesses, local government, WSRA, Clean Washington Center, and Ecology. The group recommended that Ecology survey only business that are the first point of collection for recyclable materials and not brokers, processors and end-users. This will make the processing of the survey less labor intensive and decrease the time necessary to publish recycling information.

❖ Disposal of Solid Waste

- **Municipal Solid Waste Landfills**

  In 1994, 3,878,615 tons of solid waste were disposed of in 36 MSW landfills. This amounts to 0.95 tons of waste per person each year. In 1993, a total of 3,726,055 tons was disposed of in 43 MSW landfills.

[1] Response to the recycling survey in 1994 decreased from 60% to only 47%. This likely resulted in a lower than actual measured recycling rate for 1994.

In 1994, public landfills accepted 44% of the waste (compared to 69% in 1991); 56% was disposed in private landfills (compared to 31% in 1991). This shows the increasing trend for the use of private landfills.

- **Energy Recovery/Incineration**

  In 1994, 90% of the waste disposed in Washington was disposed in landfills and 10% was incinerated. A total of 421,626 tons of municipal solid waste was incinerated. This is a slight decrease from the 431,928 tons incinerated in 1993. One incinerator ceased operation in May 1995. With no new incinerators planned, the amount of waste incinerated will likely remain stable.

  A total of 113,272 tons of ash produced by the MSW energy recovery facilities was disposed at the only permitted ash monofill in Washington at Roosevelt Regional Landfill in Klickitat County.

- **Solid Waste Importation/Exportation**

  In 1994, Washington's landfills and incinerators received 67,113 tons of waste from outside the state. This amounts to less than 2% of the waste disposed in the state. Washington exported 770,514 tons of waste to landfills in Oregon.

- **Remaining Capacity for Municipal Solid Waste Landfills**

  Of the 36 MSW landfills that received waste in 1994, 13 closed and 23 remained operating into 1996.

  Self-reporting by the 23 MSW landfills that will be operating into 1996, indicated about 177 million tons of permitted capacity remained, or approximately 45 years at the current disposal rate.[2] Of the remaining capacity, 75% is at one facility, the Roosevelt Regional Landfill in Klickitat County. The other capacity is at the other 22 landfills, most of which are operated to serve the citizens of the local area. The majority of the state's remaining capacity, located in one facility, is in eastern Washington.

- **Other Solid Waste Landfills**

  In 1994, 11 woodwaste landfills reported receiving 32,625 tons of waste, compared with 122,097 tons in 1993. A higher level of reuse and recycling

[2] Many factors can affect the amount of remaining capacity including population growth, the importing of waste from other states, and waste reduction and recycling activities.

probably accounts for the significant change in volumes of woodwaste disposed.

In 1994, 21 inert/demolition landfills reported receiving 657,614 tons of waste, compared with 834,238 tons at 22 facilities in 1993. Increased recycling of CDL materials may account for much of the decrease in the amount of waste disposed. In addition, on major facility was repermitted as a limited purpose landfill and the waste reported under that category for 1994.

In 1994, 15 limited purpose landfills reported receiving 642,251 tons of waste, compared with 407,747 tons in 1993.

- **Moderate Risk Waste**

In 1994, 11.8 million pounds of household hazardous waste were collected in Washington by either the 35 fixed moderate risk waste collection facilities or through the 129 collection events held by the counties. This compares with 14.4 million pounds collected in 1993.[3]

In 1994, 7.9 million gallons of used oil was collected from households at over 400 used oil collection depots, compared with 9 million gallons in 1993.[4]

[3] The decrease in the amount collected could be contributed to overestimates made in 1993 and also some counties were in the process of planning or building fixed facilities and did not hold collection events.

[4] The decrease in used oil collection was likely a result of Snohomish County moving their used oil collection sites either inside or having them attended. Some businesses may have been using the sites that were designated for household only, the sites may have been less accessible or the attended sites may have been more imposing for the public to use.

CHAPTER I

SOLID WASTE MANAGEMENT IN WASHINGTON

In each of the annual status reports prepared over the past three years, this chapter has been used to provide information to increase the understanding for the way in which solid waste is managed in Washington state. The information included in this chapter changes each year. A brief summary is provided about the contents of past reports. If additional information is required, please contact Ecology for the past reports.

The *First Annual Status Report* discussed some of the key roles, responsibilities and activities of local government and state government for solid waste management in Washington. These included roles for state and local solid waste planning, waste collection, facility permitting, enforcement, and data collection.

The *Second Annual Status Report* detailed the roles of both state and local government as identified in chapter 70.95 RCW, *the Solid Waste Management Act - Reduction and Recycling*.

The *Third Annual Status Report*, reviewed the statutory requirements for moderate risk waste management in Washington and detailed the roles of both state and local government for the management of moderate risk waste. A brief summary of the moderate risk waste management planning process was included.

In this *Fourth Annual Status Report*, changes, as a result of funding reductions, in Ecology's activities related to solid waste are discussed.

HISTORY OF SOLID WASTE MANAGEMENT IN WASHINGTON

Washington has been a leader in solid waste management since the passage of the first *Solid Waste Management Act* in 1969 (chapter 70.95 RCW). In 1989, the Legislature passed the *"Waste Not Washington Act"* (ESHB 1671), which in part amended chapter 70.95 RCW. It established the following priorities for solid waste management:

1. Waste reduction.
2. Recycling, with source separation of recyclable materials as the preferred method.
3. Energy recovery, incineration or landfilling of separated wastes.
4. Energy recovery, incineration or landfilling of mixed wastes.

The Act also set a goal of recycling 50% of the state's waste by 1995.

Ecology was directed to develop a state solid waste management plan, study problem wastes, develop a waste characterization plan, develop statewide outreach campaigns to educate citizens about waste reduction and recycling, assist local governments in the development of revised local comprehensive solid waste management plans and other specific studies and activities.

This Act also created the Solid Waste Management Account, funded by a 1% tax on solid waste collection services. This account funded much of Ecology's solid waste activities as well as provided grants to local governments for their solid waste plan preparation and implementation. This account sunset in July 1995. The immediate result was a loss of staff resources at Ecology. Local government grants were continued using other short-term fund sources. Some of the changes to Ecology activities as a result of decreased funding are discussed below.

CHANGES TO ECOLOGY ACTIVITIES

Although there was a significant loss of staff to Ecology, many Legislative mandates were successfully completed. Others were developed and are being implemented. Some of the key activities include:

- Developing a State Solid Waste Management Plan completed in January 1991. In 1996, Ecology will be evaluating specific aspects of solid waste management in Washington.

- Updating the Solid Waste Planning Guidelines to incorporate waste reduction and recycling element which was completed in March 1990.

- Reviewing and approving all new local solid waste management plans that included the new waste reduction and recycling elements. By the end of 1995, most counties in Washington had completed their revised plans. Ecology has significantly reduced the number of staff providing planing assistance. A planner in each regional office continues to review updated plans and to provide technical assistance for plan implementation.

- Assisting local governments with citizen information programs for waste reduction and recycling. Ecology undertook two major Waste Reduction and Recycling Public Information and Education grant programs (WRRPIE). Materials were developed and distributed by Ecology. Ecology now coordinates two statewide campaigns but provides only master copies of campaign materials. Local governments have the responsibility to duplicate and distribute the materials to citizens.

- Developing an operator certification program for landfill and incinerator operators. This program was initiated in 1991. As of August 1995, 240 landfill certificates and

146 incinerator certificates had been renewed, with over 60 enrolled in the home study landfill course and over 30 enrolled in the incinerator course

- Providing waste stream analysis, a recycling survey and additional information management. Two major waste stream analyses were completed, the *Best Management Practices Study* (1989) and the *1992 Waste Characterization Study.* Since 1989, Ecology has also prepared an annual recycling survey. For the past three years, an annual status report including solid waste disposal and facility information has been prepared. Although no funding continues for waste characterization studies, Ecology will continue the annual recycling survey and the annual status report. These two will be published as one document.

PLANNED FUTURE ACTIVITIES

With reduced resources, Ecology is focusing efforts on waste reduction, specific waste streams for recycling, and disposal. Less effort will be directed to general household recycling which is now being implemented by local governments. Efforts will be made to provide technical assistance, especially to the smaller local governments, and to complement work being undertaken by other state agencies, such as the Clean Washington Center. Some of these activities will include:

Waste Reduction and Recycling

- Waste reduction (pollution prevention) and recycling activities will focus on wastes that still make up a large portion of the waste stream - organics, and construction, demolition and landclearing (CDL) debris.

- A compost facility resource handbook, yard waste composting focus sheets and working with the food processing industry will be the major focus for the organics strategy.

- Waste reduction in new construction, as well as gypsum wallboard and woodwaste recycling, will be the centerpiece for the CDL strategy.

- Regulatory clarification for gypsum wallboard and woodwaste recycling will complement the activities of the Clean Washington Center as they focus on market development for these two wastes.

Technical Assistance

- Technical assistance, through engineering and hydrogeology staff in the regions, will be directed mainly at the large complex landfills, at new disposal/recycling operations, such as composting and biosolids, and providing assistance to the smaller jurisdictional health departments.

- A new regulation, chapter 173-308 WAC, *Biosolids Recycling*, will be completed to meet federal and state requirements.

State Grant Investments

Both the Coordinated Prevention Grants and the Remedial Action Grants programs will be reevaluated prior to the FY97-99 funding cycle. These two grant programs provide over $40 million biennially to local governments. Program modifications are necessary to respond to changing needs at the local government level and new priorities at the state level to insure that these programs continue to improve the state's environment.

CHAPTER II

SOLID WASTE HANDLING INFRASTRUCTURE

This chapter describes the basic facilities, equipment and installations making up the solid waste infrastructure for the management of solid and moderate risk wastes within Washington state.

Once solid waste is generated, its handling can be categorized into three distinct classifications that describe what can happen to it. Solid waste can either be: (1) landfilled; (2) intermediately handled - stored, transferred, processed; or, (3) incinerated. A fourth category, Ancillary-Other, explains anomalies to the three basic classifications of solid waste handling.

Moderate risk waste is, by definition, excluded from regulation as dangerous waste, even though it has the characteristic of dangerous waste. Moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Regulated solid waste facilities in the state are covered by three rules developed by Ecology. The first rule, chapter 173-304 WAC, *the Minimum Functional Standards (MFS)* identified 18 distinct solid waste facility types, each with its own set of permitting criteria. (Two of the 18 types identified in the MFS, sludge and septage utilization facilities, are in the process of being re-defined by federal criteria[5] and are being tracked separately from this annual status report.)

Table 2.1
State Solid Waste Infrastructure

CLASSIFICATION	STATEWIDE TOTAL	
	1993	1994
Landfill	92	84
Intermediate	207	222
Incineration	6	5
Ancillary - Others	27	4*
Total Solid Waste Infrastructure	332	315

*Compost facilities were added to the intermediate classification.

The second rule pertains to municipal solid waste landfills, chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*. The third rule regulating solid waste handling facilities is chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, which sets permitting, construction and operating standards for MSW incinerator ash monofills.

In this report, Ecology has identified 315 solid waste handling facilities in Table 2.1. Facility ownership is categorized as either PUBLIC for those facilities owned by a

[5] Federal Criteria, once adopted in rule, will no longer consider sludge or septage as solid waste materials; they will be considered biosolids. Ecology's Solid Waste and Financial Assistance Program is responsible for state rule development.

recognized jurisdiction of government - a city, county or special purpose district - or as PRIVATE, for those facilities owned by corporations, partnerships or private individuals.

For a greater understanding of Washington's solid waste infrastructure, a closer examination of each solid waste infrastructure classification and applicable "type" sub-category follows.

LANDFILL CLASSIFICATION

The regulated permanent disposal of solid wastes in landfills in Washington occurs in five types of facilities: (1) ash monofills; (2) inert/demolition landfills; (3) limited purpose landfills; (4) municipal solid waste landfills; and (5) woodwaste landfills. (See Table 2.2.) A short discussion of each landfill classification "facility type" and its relationship to the state's overall infrastructure follows. A more detailed discussion of waste types and amount disposed and incinerated, movement of waste into and out of state, as well as trends in waste management, is found in Chapter VI.

Table 2.2
Landfill Classification

FACILITY TYPE	TOTAL # STATEWIDE		TOTAL BY OWNERSHIP DESIGNATION			
	Active	Active	Public		Private	
	1993	1994	1993	1994	1993	1994
Ash Monofill	1	1	0	0	1	1
Inert/ demolition	22	21	6	5	16	16
Limited Purpose	15	15	1	1	14	14
Municipal solid waste	43	36	35	29	8	7
Woodwaste	11	11	1	1	10	10
TOTAL	92	84	43	35	49	34

Ash Monofills

Ash monofills are landfill units that receive ash residue generated by municipal solid waste incinerator/energy-recovery facilities. The *Incinerator Ash Residue 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 than 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 ash monofills to be used for ash disposal.

The only permitted ash monofill in Washington is located at the Roosevelt Regional Landfill in Klickitat County. The monofill operates under a permit issued by Ecology, and received 113,272 tons of special incinerator ash in 1994.

Inert/Demolition Waste Landfills

Inert/Demolition Waste landfills are facilities which receive "more than two thousand cubic yards of inert wastes and demolition wastes."[6] These facilities are regulated under WAC 173-304-461.

Table 2.3
Inert/Demolition Landfills

OWNERSHIP	TOTAL	
	1993	1994
Public	6	5
Private	16	16
TOTAL	22	21

Ecology identified 21 inert/demolition landfills that took 657,614 tons of waste in 1994. Table 2.3 illustrates the profile of inert/demolition facilities statewide over the past two years. Most (76%) of the inert/demolition landfills are privately owned and operated. Public inert/ demolition landfills make up 24% of this facility type.

Limited Purpose Waste Landfills

Limited purpose landfills are facilities that receive "solid wastes of limited types, known and consistent composition, other than woodwastes, garbage, inert waste and demolition waste."[7] These facilities are regulated under WAC 173-304-460(5). Limited purpose landfills are identified by the type of waste. In other words, the waste associated with a limited purpose landfill is unique to that facility.

Ecology identified 16 limited purpose landfills statewide that accepted 642,251 tons of waste in 1994. Table 2.4 illustrates the profile of limited purpose facilities statewide. All but one of the regulated limited purpose landfills are private. The waste disposed in these facilities is usually generated by the owner of the landfill.

Table 2.4
Limited Purpose Landfill

OWNERSHIP	TOTAL	
	1993	1994
Public	1	1
Private	14	15
TOTAL	15	16

[6] WAC 173-304-461(1)

[7] WAC 173-304-100(98)

Municipal Solid Waste Landfills

Chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*, effective November 1993, incorporated the new federal Subtitle D rules. It was the first major revision of landfill regulations since 1985. The new rule strengthens engineering, siting, operational, closure/post-closure and ground water monitoring standards for existing and new municipal solid waste landfills. It set a deadline of October 9, 1994, for existing landfills to close or be subject to the new rules. The new standards also address the need for corrective action financial assurance for landfills that may fall under cleanup requirements of federal and state Superfund laws.

Facilities that stopped accepting waste prior to October 9, 1993, closed under the MFS, chapter 173-304 WAC. Those facilities that received waste after October 9, 1993, were required to close under chapter 173-351 WAC. (The EPA did allow an extension of the closure date to April 9, 1994, for MSW facilities that receive less than 100 tons of waste per day. At least 10 landfills opted to close between October 1993 and April 1994 in Washington.) Of the 43 active MSW landfills in 1993, 19 closed rather than operate under the new requirements. After April 1994, 24 MSW landfills continued to receive waste.[8]

Table 2.5
Municipal Solid Waste Landfills

OWNERSHIP	TOTAL	
	1993	1994
Public	35	29
Private	8	7
TOTAL	43	36

Thirty-six (36) MSW landfills accepted 3,878,615 tons of waste in 1994. (See Chapter VI for additional discussion of waste types, amounts and sources.) Table 2.5 identifies the statewide infrastructure profile for 1993 and 1994.

The majority, 81%, of MSW landfills are operated by public entities. This has historically been true in Washington. Private MSW landfills constitute only 19% of this facility type. Even though most of the landfills are owned by public entities, the majority of landfill capacity (80%) is under the control of the private sector. (See the discussion on landfill capacity, in Chapter VI.)

[8] One additional landfill closed at the end of 1995, leaving only 23 operating MSW landfills in Washington at the end of 1995. See Chapter VI for a discussion of remaining capacity.

Woodwaste Landfills

Woodwaste landfills are those facilities which landfill "more than 2,000 cubic yards of woodwaste, including facilities that use woodwaste as a component of fill."[9] These facilities are regulated under WAC 173-304-462.

Table 2.6
Woodwaste Landfills

OWNERSHIP	TOTAL	
	1993	1994
Public	1	1
Private	10	10
TOTAL	11	11

The MFS defines woodwaste as "solid waste consisting of wood pieces or particles generated as a by-product or waste from the manufacturing of wood products, handling and storage of raw materials and trees and stumps. This includes, but is not limited to, sawdust, chips, shavings, bark, pulp, hog fuel, and log sort yard waste, but does not include wood pieces or particles containing chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenate."[10]

Ecology identified 11 woodwaste landfills that accepted 32,625 tons of waste in 1994. Only one woodwaste landfill is publicly owned.

INTERMEDIATE CLASSIFICATION

Solid waste, prior to its final disposal or incineration, is often accumulated at a storage facility, consolidated at a transfer station, converted into a useful product, or prepared for recycling or disposal at a processing center. The storage, transfer or processing of solid wastes are regulated by the MFS and fall under the interim[11] or intermediate classification of solid waste handling facilities. Moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Specifically, a storage facility primarily holds "solid waste materials for a temporary period"[12] while a processing center is in the operation of converting "solid waste into a useful product or to prepare it for disposal."[13] A transfer station, on the other hand, is a "permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility."[14]

[9] WAC 173-304-462(1)

[10] WAC 173-304-100(91)

[11] WAC 173-304-100(38)

[12] WAC 173-304-100(76)

[13] WAC 173-304-100(62)

[14] WAC 173-304-100(82)

The distinguishing characteristic of all interim or intermediate classification solid waste handling facilities is that they are not designed for final disposal. There are 10 types of intermediate facilities: (1) baling stations; (2) compacting stations; (3) composting facilities; (4) drop boxes; (5) moderate risk waste fixed facilities; (6) piles; (7) recycling centers; (8) surface impoundments; (9) transfer stations; and (10) tire piles.

Bale Station

A bale station is a facility that processes loose solid waste into large bound bundles. The purpose of binding waste in this fashion is to place the bundles into lifts at a landfill. These facilities are regulated under WAC 173-304-410. Because this technology is often confused with compacting stations, and since bale stations are regulated under the same section of the MFS, to date no bale stations have been permitted as separate facilities.

Compacting Station

A compacting station is a facility which employs mechanical compactors to compress solid wastes into dense packets of material for shipment. These facilities are regulated under WAC 173-304-410.

Ecology identified seven compacting stations statewide in 1994. All compacting facilities are under public ownership and are affiliated with recycling operations. Compacting stations are located in the more urban, northwestern counties of the state. Larger urban centers are more inclined to use this technology to process large amounts of recyclables for shipment. Compactors are also used at transfer stations, though they are not permitted separately.

Compost Facilities

A compost facility is a facility which promotes the biological decomposition of organic solid waste, and other organic material, yielding a product for use as a soil conditioner. Composting is considered a key element of the state's strategy of reaching the statewide 50% recycling goal.

The MFS regulates compost facilities under the non-containerized solid waste standards for recycling facilities in WAC 173-304-300 (1)(a)(i) and under WAC 173-304-420, depending upon the "condition specific" nature of the waste e.g., whether or not the waste produces, or has the potential to produce, leachate. In 1994, 18 compost facilities permitted under the MFS were identified.

Table 2.7
Compost Facilities

OWNERSHIP	TOTAL	
	1993	1994
Public	7	7
Private	9	11
TOTAL	16	18

Ecology is developing a resource handbook for compost facilities. This handbook will address facility designs and operating procedures to protect human health and the environment. (See Chapter IV for additional discussion.)

Ecology issued *Interim Guidelines for Compost Quality*[15] in April 1994 and revised them in November 1994. The guidelines focus on the finished compost product. One of the primary objectives of these guidelines was to promote consumer acceptance of composted products by creating statewide standards and enhanced consumer confidence in the safety of these products.

Drop Boxes

A drop box is defined in the MFS as "a facility used for the placement of a detachable container including the area adjacent for necessary entrance and exit roads, unloading and turn-around areas."[16] It is regulated under WAC 173-304-410.

Table 2.8
Drop Boxes

OWNERSHIP	TOTAL	
	1993	1994
Public	64	61
Private	5	4
TOTAL	69	65

Drop boxes normally serve the general public by receiving loose loads of waste that are transported to the site by an individual for later disposal or recycling. Typically drop boxes for household waste are located in the more rural areas of the state.

Ecology identified 65 operating drop boxes in 1994. Table 2.8 depicts the profile of regulated drop boxes statewide. The majority, over 94%, are public and are primarily operated by county public works departments.

Piles

A solid waste pile is described in the MFS as any "noncontainerized accumulation of solid waste that is used for treatment or storage."[17] Pile storage/treatment areas are usually associated with the storage and processing of wastes requiring remedial actions, such as petroleum-contaminated soils. (Compost facilities can also be regulated under this section as discussed above.) Pile facilities or areas used for storage and treatment are regulated by WAC 173-304-420.

[15] *Interim Guidelines for Compost Quality*, Solid Waste Services Program, Department of Ecology, Publication #94-38, April 1994.

[16] WAC 173-304-100(25)

[17] WAC 173-304-100(56)

Only four of these piles (non-composting) were identified in 1994. Three of the four identified regulated piles were publicly owned and operated by county public works departments.

Recycling Facilities

A regulated recycling facility refers to an operation engaged in the collection and utilization of solid waste for the purpose of transforming or remanufacturing the waste materials into usable or marketable materials for use other than landfill disposal or incineration. Chapter 70.95 RCW, the *Solid Waste Management Act* refers to "recyclable materials" as "those solid wastes that are separated for recycling or reuse, such as papers, metals, and glass, that are identified as recyclable material pursuant to a local comprehensive solid waste plan."[18] Recycling facilities are regulated under WAC 173-304-300.

It is important to note that many types of recycling facilities are not regulated by the MFS. For example, the regulations do not apply to single family residences and single family farms engaged in composting of their own wastes (exempt from any other regulations); facilities engaged in the recycling of solid waste containing garbage, such as garbage composting; facilities engaged in the storage of tires; problem wastes; facilities engaged in recycling solid waste stored in surface impoundments, which are otherwise regulated in the MFS (WAC 173-304-400); woodwaste or hog fuel piles to be used as fuel or raw materials stored temporarily in piles being actively used; nor do they apply to any facility that recycles or uses solid wastes in containers, tanks, vessels, or in any enclosed building, including buy-back recycling centers. Composting and land application of materials are regulated under other portions of chapter 173-304 WAC.

Because of the distinction between regulated recycling facilities and non-regulated activities that promote recycling, only 12 regulated recycling facilities were identified in 1994. The majority (80%) of the regulated recycling facilities were private facilities and public recycling facilities constituted 20% of this facility type.

Surface Impoundments

A surface impoundment refers to "a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), and which is designed to hold an accumulation of liquids or sludges. The term includes holding, storage, settling, and aeration pits, ponds, or lagoons, but does not include injection wells."[19]

[18] RCW 70.95.030(14)
[19] WAC 173-304-100(80)

Some surface impoundments are regulated under WAC 173-304-430.[20] Ecology identified seven such regulated facilities in 1994. All seven of these surface impoundment facilities were septage lagoons. The category remains in the intermediate classification pending interpretation or clarification in the forthcoming biosolids rule. The majority of the regulated surface impoundment facilities were publicly-owned, and one is privately-owned.

Transfer Stations

A transfer station is defined as "permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility."[21] The regulations applicable to transfer stations are contained in WAC 173-304-410.

Typically, transfer stations are areas where individual collection vehicles can be off-loaded, the waste stored for a short period of time and reloaded onto larger vehicles for transfer to the disposal facility.

In the past, transfer stations were generally located in larger, urban areas; however, with the new federal regulations applicable to municipal solid waste landfills, jurisdictions are now viewing transfer stations as an option to operating a landfill. Wastes can be collected at these centers for long-hauling to regional MSW landfills.

Table 2.9
Transfer Stations

OWNERSHIP	TOTAL	
	1993	1994
Public	44	44
Private	22	23
TOTAL	66	67

Transfer stations often have areas where the public can bring waste for disposal. Many also have recycling facilities and/or household hazardous waste collection areas. There were 67 regulated transfer stations operating in 1994. This does not include those facilities that handled only moderate risk waste.

The profile (Table 2.9) shows that the majority of the transfer stations continue to be publicly operated entities, 66%.

[20] Surface impoundment facilities permitted under federal, state or local water pollution control laws are excluded from regulation under WAC 173-304-430.

[21] WAC 173-304-100(82)

Moderate Risk Waste Facilities

Moderate risk waste is, by definition, excluded from regulation as dangerous waste, even though it has the characteristic of dangerous waste. Moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Fixed facilities typically have a hazardous management plan pursuant to article 80 of the *Uniform Fire Code*, as well as a solid waste handling permit issued by the jurisdictional health district. There are currently over three dozen fixed facilities in Washington, with 15 more in the planning or design stages.

Generally, used oil collection facilities are not required to have solid waste handling permits in accordance with the MRW Fixed Facility Guidelines[22], but often carry a Fire permit. There are about 500 used oil collection facilities in the state.

Household hazardous waste collection events require no permit under state law. However, Ecology has provided guidelines[23] which are widely used.

Despite the large volumes of hazardous waste now entering the moderate risk waste collection and management system, there have been no major releases to the environment to date at any facility or event. (See Chapter VI for additional discussion of materials collected.)

Tire Piles

In Washington state, about four million tires are discarded each year. The discarded tires often are taken to tire pile storage facilities. A regulated tire pile facility in Washington is any tire pile that temporarily stores or accumulates more than 800 tires. Tire pile standards are contained in WAC 173-304-420.

A major component of tire disposal in the state has been illegal tire dumping. This section, however, deals specifically with regulated tire piles. (See Chapter III for additional information about the cleanup of illegal tire piles.) Ecology identified seven tire piles in the state in 1994. Each regulated tire pile was privately owned.

INCINERATION CLASSIFICATION

An energy recovery facility is considered a combustion plant which specializes in the "recovery of energy in a useable form from mass burning or refuse-derived fuel incineration, pyrolysis or any other means of using the heat of combustion of solid waste that involves high temperature (above twelve hundred degrees Fahrenheit) processing."[24]

[22] *Moderate Risk Waste Fixed Facility Guidelines*, Department of Ecology, Publication No. 92-13, March 1992 (revised May 1993).
[23] *Household Hazardous Waste Guidelines for Conducting Collection Events*, Department of Ecology, Publication #88-6, February 1989.

[24] WAC 173-304-100(26)

By definition, incineration as it applies to solid waste materials, means "reducing the volume of solid wastes by use of an enclosed device using controlled flame combustion."[25]

Energy recovery and incinerator facilities are regulated under WAC 173-304-440 applies to "all facilities designed to burn more than twelve tons of solid waste per day, except for facilities burning woodwaste or gases recovered at a landfill."[26]

Ecology identified five regulated solid waste incinerator facilities that burned a total of 421,626 tons of waste. One of the incinerators, Inland Empire Paper in Spokane, falls under the *Minimum Functional Standards* as a solid waste incinerator because they burn more than 12 tons of solid waste per day. At this facility, the waste is composed of the paper sludge from the pulp and papermaking process. The other four incinerators burn municipal solid waste.

Table 2.10
Incinerator Classification

OWNERSHIP	TOTAL	
	1993	1994
Public	3	2
Private	3	3
TOTAL	6	5

In addition to solid waste handling permit requirements under the MFS, solid waste incinerators may be subject to regulations under chapter 70.138 RCW, the *Incinerator Ash Residue Act*. The rules implementing this, chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, require certain solid waste incinerators to prepare generator (ash) management plans. These rules do 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. They also do not apply to facilities which burn less than 12 tons of municipal solid waste per day

Of the five solid waste incinerators operating during 1993, four of these facilities are subject to both the requirements of chapter 173-304 WAC and chapter 173-306 WAC. These four facilities are required to have a generator ash management plan, approved by Ecology, which discusses the handling, storage, transportation and disposal of the incinerator ash. All four facilities, three public and one private, have approved generator ash management plans and solid waste handling permits.[27]

[25] WAC 273-304-100(37)

[26] WAC 173-304-440(1)

[27] One of the public municipal solid waste incinerators ceased operations in May 1994.

ANCILLARY - OTHER CLASSIFICATION

The classification of Ancillary - Other, is not covered or spelled out in regulation but is included here to explain certain anomalies discovered in the reporting process that may have an effect in subsequent reporting years. To qualify for inclusion in this category, a facility type must be either under regulatory modification, be exempted from regulation, or determined to be an obscure facility type needing reclassification or elimination outright. This classification includes: (1) Biosolids; (2) Exempted-Tribal Facilities; (3) Landspreading; and (4) Other.

Biosolids Regulation Development

In 1992, the Legislature passed ESHB 2640, an *Act Relating to Municipal Sewage Sludge.* The new chapter 70.95J RCW, *Municipal Sewage Sludge - Biosolids*, defines biosolids as "municipal sewage sludge that is primarily organic, semisolid product resulting from the waste water treatment process, that can be beneficially recycled and meets all requirements under this chapter. Biosolids includes septic tank sludge, also known as septage, that can be beneficially recycled and can meet all requirements of chapter 70.95J RCW." Ecology was directed to revise the existing program for biosolids management and develop a new regulation.

Ecology is currently developing chapter 173-308 WAC, *Biosolids Recycling.* The regulation is being developed with the assistance of an advisory committee of approximately forty persons from within and without the agency. A final regulation is not expected before late 1996. The rule development process included public workshops in September and October 1995, and will include formal public hearings in 1996.

Municipal sewage sludge and septage are presently classified as solid wastes under chapter 70.95 RCW, the *Solid Waste Management Act*, and chapter 173-304 WAC, the *Minimum Functional Standards*. The new regulation will create standards for municipal sewage sludge and domestic septage which allow each to be classified as biosolids. Biosolids will not be solid waste, and will be regulated under chapter 70.95J RCW and chapter 173-308 WAC. Ecology will have primacy in permitting the final use of biosolids, but will be able to delegate authority to local jurisdictional health departments on request.

In November 1993, chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills* went into effect. WAC 173-351-220(10) restricts the disposal of municipal sewage sludge or biosolids in municipal solid waste landfills. Impetus for the restriction on disposal came from two statutes. RCW 70.95.255 gave Ecology the authority to ban the disposal of municipal sewage sludge in landfills. Chapter 70.95J RCW directs Ecology to maximize the beneficial use of municipal sewage sludge.

In 1993, acting on the solid waste management authority of chapter 70.95 RCW and the mandate of chapter 70.95J RCW for biosolids management, Ecology restricted, but did not ban the disposal of municipal sewage sludge and biosolids in landfills.

Jurisdictional health departments are allowed to make a finding that available management options other than landfill disposal would pose a potentially unhealthful circumstance. They may grant temporary permission to a generator to dispose of municipal sewage sludge or biosolids in a landfill while unfavorable characteristics of the sludge are addressed or better management options are developed. Ecology may allow disposal by granting authority under a facility's NPDES permit or a permit issued under chapter 70.95J RCW.

Ecology prefers beneficial use as a management option, and long-term disposal by permit would generally be granted only in cases of economic unfeasibility. Ecology has, and will continue, to work with generators and local jurisdictional health departments to allow disposal for a period of time while a generator works on developing a viable beneficial use option.

Exempted Facilities

Exempted facilities, for the purpose of this report, are those solid waste handling facility types that are identified under Washington statute or rule but are either (1) not under the jurisdiction of state or local governments, such as Tribal solid waste facilities; or (2) are exempted for consideration by other federal, state or local laws, such as woodwaste facilities which fall under Department of Natural Resources rules. Three such facilities were identified in 1994.

Landspreading Disposal Facilities

A landspreading disposal facility under the MFS is a facility that applies sludges or other solid wastes onto or incorporates solid waste into the soil surface at greater than agronomic rates and soil conditioners/immobilization rates. Landspreading disposal facilities are regulated under WAC 173-304-450. Only one permit was issued in this category. (Many sites using biosolids for land application will be permitted under the new biosolids regulation discussed above.)

Other Facilities

The "other" category of facility types is an actual category of the MFS and applies to "other methods of solid waste handling such as a material resource recovery system for municipal waste not specifically" identified elsewhere in the MFS. The specific regulations for "other" facilities are in WAC 173-304-470. This type of facility is basically a miscellaneous category which is designed to cover new solid waste technologies that are developed between MFS revisions. The incinerator at Friday Harbor has been included under this category because it does not meet the MFS definition

of an incinerator. One other permit was issued in this category, to a medical waste recycling facility.

CHAPTER III

IMPLEMENTING SOLID WASTE ACTIVITIES

Ecology helps local governments fulfill their role as waste managers by providing financial assistance in the form of grants. These grants cover some of the costs of planning for solid and moderate risk waste management, for implementing those plans, and for enforcing regulations. Some grant are provided to private contractors for cleaning up some illegal tire piles. Small grants are also provided to citizen groups to help implement the state's priorities of waste reduction and recycling.

GRANTS TO LOCAL GOVERNMENTS

Various grants programs fund local government activities including:

- inspecting facilities and pursuing illegal dumpers
- collecting and disposing of household hazardous waste
- working with businesses to find ways to reduce and recycle their moderate risk waste
- teaching people how to prevent waste and to recycle
- providing curbside and drop box collection for recyclables
- providing yard waste composting
- drilling ground water monitoring wells at active landfills
- training staff
- undertaking special projects, such as closing landfills or demonstration projects

Ecology awarded $29,299,697 in grants for waste management from April 24, 1993, through June 30, 1994. The grants, in combination with local matching funds, supported $45,468,686 worth of solid and moderate risk waste projects. An additional $794,929 in amendments went to existing grants. Ecology also supports efforts to clean up contaminated sites through the remedial action grants program, which awarded over $17.8 million from April 24, 1993, through June 30, 1994.

Coordinated Prevention Grants (CPG)

Most of the solid and moderate risk waste projects are funded through the Coordinated Prevention Grants program. Ecology launched this consolidated program of grants for waste management in 1992. It combines funds from all sources and reduces the oversight needed to properly administer the programs (see next page for a listing of fund sources for grants).

This structure encourages local governments within a county 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 county-wide areas, using a formula

based on a set amount per county plus a certain amount per capita. Grant recipients must provide a cash match of 25 to 40 percent, based on the economic viability of the county, of the total eligible costs of their projects.

For example, in Adams County the county and the health district received $80,128 in grant funding, which they matched with $43,146 in local dollars. The health district has the responsibility to enforce solid waste regulations and ordinances, inspect facilities, and review and issue permits. The county is responsible for all other waste management activities. They used the grant funding to:

- Review, update and write solid waste permits for various facilities and sites
- Investigate 47 cases of illegal dumping
- Conduct six inspections of landfills and ten inspections of other permitted facilities
- Work on the issue of biosolids application, including conducting sampling and developing rules, regulations and guidelines
- Hire a waste reduction and recycling coordinator to develop solid waste programs, and train that person in hazardous materials and safety
- Develop and distribute a quarterly waste reduction and recycling newsletter
- Buy equipment to recover chlorofluorocarbons (CFCs) from appliances brought to the Bruce Landfill
- Buy and install five used oil collection tanks and five waste oil-burning furnaces for the county maintenance shops and the Bruce Landfill
- Conduct four household hazardous waste collection events
- Set up a vehicle battery collection station at the Bruce Landfill

SOURCES OF GRANT FUNDING

- **Local Toxics Control Account**, established by the Model Toxics Control Act and funded by state taxes on toxic substances.
- **Hazardous Waste Assistance Account**, funded by fees paid by businesses that may generate hazardous wastes.
- **Solid Waste Management Account**, funded by a surcharge on garbage collection (sunset July 1995).
- **Referenda 26 and 39** account, funded by the sale of general obligation bonds authorized in 1971 and 1980.
- **Vehicle Tire Recycling** Account, funded by a fee on new replacement tires (sunset October 1994).

In most cases cities and counties are working together well to assess their needs and apply for funding for the projects that best meet those needs. Some cities have grant agreements separate from that for the county-wide area, while still coordinating their approach to waste challenges with the county government.

The City of Tacoma, for example, received $1,384,062, which they matched with $982,187 in local funds. Tacoma used these funds to:

- Build a recycling center and household hazardous waste collection facility at the City of Tacoma Landfill
- Buy equipment for the waste reduction and recycling and household hazardous waste collection programs
- Operate the used motor oil collection program, which received an Environmental Excellence Award from the Washington State Environmental Commission
- Assist small businesses with technical help on disposal and recycling problems (number of business visits varied from 13 to 100 per month)
- Educate and inform people about waste reduction and recycling, with an environmental curriculum in the Tacoma School District, tours of the recycling center, presentations to community and school groups, and a brochure mailed to 56,000 Tacoma residents
- Educate and inform people about household hazardous waste, with an informational newsletter distributed to approximately 65,000 Tacoma households, a display for the Tacoma Home and Garden Show, newspaper ads, flyers, and targeted mailing advertising the mobile collection facility
- Collect and dispose of household hazardous waste from the fixed and mobile facilities, and the collection event held in conjunction with Pierce County at the Tacoma Home and Garden Show ,
- Recover CFCs from over 1,000 refrigerators

Capital Investment in Waste Reduction and Recycling

Capital purchases for waste reduction and recycling equipment and facilities increased this last year as more local governments started implementing the waste reduction and recycling updates to their solid waste management plans. From April 1993 through June 1994, 25 local governments signed agreements to build or expand collection and processing facilities, purchase balers, tub grinders, used oil collection tanks and other equipment, and provide drop boxes and recycling bins for their residents.

One reason for this increased activity is the $12 million Ecology set aside for waste reduction and recycling capital costs from the funds remaining in the Referenda 26 and 39 accounts. This money is available through Coordinated Prevention Grants until the end of 1997.

Landfill Closures

Landfill closures also increased activity, with 13 counties and cities using grants to close 15 municipal solid waste landfills in accordance with state environmental regulations. Properly closing landfills prevents future contamination, but it is costly, especially for local governments with old landfills that are no longer bringing in revenue through tipping fees. Active landfills are required to have funds set aside for closure and post-

closure monitoring, so this part of the coordinated prevention grants program will end in 1995.

An example of landfill closure is Island County, which used a $500,000 grant (the maximum amount available) and $750,000 in local match to close the Coupeville Landfill. Closing the landfill will help protect the county's sole source aquifer area. The landfill closure involved engineering design, testing materials to make sure they met the minimum functional standards set by the state, and final construction with a multiple layer cap and control systems for surface water and landfill gas.

GRANTS TO CITIZENS

Public Participation Grants

Ecology also provides small grants, with no matching funds required, to citizen groups whose projects help implement the state's priorities of waste reduction and recycling. This Public Participation Grants program is mandated by the *Model Toxics Control Act*, chapter 70.105D RCW and is funded from the Hazardous Waste Assistance Account. All projects must include an education element directed at an audience beyond the group's members.

From April 1993 through June 1994, Ecology awarded 28 Public Participation Grants. They covered a wide range of approaches to preventing and recycling waste. One example was the Sustainable Building Collaborative which used a $26,908 grant for the "Building With Value Conference" to teach people in the building industry how to reduce waste and recycle materials. The conference also introduced the more than 500 attendees to a wide array of recycled building products. The Collaborative produced a "Guide to Resource Efficient Building" and a set of fact sheets to reach a wider audience.

Another grant went to the Pomegranate Center which used a $23,460 grant for a project to raise people's awareness of the amount of waste they generate. The Center recruited 750 middle and high school students and 50 teachers and other adults to commit to save all the garbage they produced in one week. Midway through the week they weighed their trash and learned about waste prevention and recycling opportunities. At the end of the week they weighed the trash again, to see if they had put their knowledge of waste prevention and recycling into practice. The Center provided written materials and a videotape about the project and its results.

CONTRACTS TO THE PRIVATE SECTOR

Tire Pile Cleanup Contracts

In 1989, the legislature established a one-dollar-per-tire fee on the retail sale of new vehicle tires. This funding source was to be used to cleanup existing unauthorized tire piles around the state. Ecology, in conjunction with local jurisdictional health departments, created a prioritized cleanup list containing 25 sites located in seven counties.

Table 3.1
Unauthorized Tire Sites Cleaned-Up

County	Number of Sites	Number of Tires
Asotin	1	52,210
Clark	1	172,500
Kittitas	1	28,355
Pierce	10	1,686,674
Spokane	3	3,298,998
Stevens	2	3,781
Thurston	7	2,101,749
TOTAL	25	7,344,267

The first cleanup contracts were executed in May of 1991. Cleanup of a major tire pile site in Pierce County (1.0 million tires) that began in the spring of 1994 was completed in 1995. In 1995, three tire piles in Spokane County, one of 2.2 million tires and two of 1.1 million tires were also cleanup in 1995. With the completion of those sites, Ecology completed the cleanups at all of 25 originally identified sites.

Some of the tires removed during the cleanups became fuel for cement kilns or pulp mills. Others were retreaded, made into marine bumpers or pulverized for use in road projects. The remaining tires were shredded and landfilled.

During the process of cleaning up the original 25 piles, costs per site decreased. There were some funds from the original allotment remaining so in 1996, Ecology will begin the cleanup of over 2 million tires located in Lewis County at a formerly permitted storage and recycling center.

Ecology estimates there are 10 additional sites, with approximately 3.2 million tires statewide, that need to be cleaned up from unpermitted tire piles. Even though the tire fee sunset October 1, 1994, there are sufficient funds left in the tire account to cleanup most of the remaining tire piles. Ecology is seeking authorization from the Legislature in 1996 to spend these remaining funds for these cleanups.

OTHER INNOVATIONS

Ecology is continually working to make grants more efficient and effective in producing benefits to the environment. One result is the "outcome funding" approach to grant projects, which ties the grant agreement to specific, measurable environmental benefits. Grant projects have always been intended to improve and protect the environment, but the projects have not always been structured so that details of that improvement could be

captured. The outcome funding approach will help Ecology determine how to get the best return on the investment of grant dollars.

Ecology is a member of the Infrastructure Assistance Coordinating Council, an ad hoc committee of state and federal agencies that assist local governments with their infrastructure needs. In late 1993, and the first part of 1994, the Council experimented with a direct consultation service to match funding programs to a local government's needs. The higher than expected number of requests from over 50 communities and jurisdictions has prompted the Council to analyze the program to develop a more manageable service.

FUTURE OF THE GRANT PROGRAM

Millions of dollars have been provided to local governments for solid waste related activities over the past several years. Many of the changes in the solid waste management system have been a result of programs funded by grant funds. Some of the changes that have occurred include:

- Local governments revising their solid waste management plans to include recycling and waste reduction and preparing moderate risk waste plans.
- Curbside recycling availability to over 70% of the state's population.
- A recycling rate approaching 40%
- Moderate risk waste collection and disposal through a network of fixed facilities and household collection events.
- Municipal solid waste landfills not meeting new standards being closed and landfills that were hazardous waste cleanup sites have been dealt with.

With the sunsetting of the Solid Waste Management Account in 1995, and reduced resources available in the Toxics Fund, fewer funds are available for all grant activities.

It is time for an evaluation of the activities that were grant funded. How effective have those activities been? Where is there a continuing need for funding? What other activities should be funded? What happens to existing programs if grant funds are not continued?

Continued funding of activities at the current levels into the future is unlikely. The task now is to determine what areas would benefit from grant funds.

Ecology will be looking at several areas of past state grant investment programs and at how successful those program have been. Determination as to what future activities

should be funded through grants will result from this evaluation. Grant activities to be evaluated include:

- *Moderate risk waste* - an infrastructure of fixed moderate risk waste collection facilities exists in the state. Household collection events are held on a regular basis. Materials collected are recycled or disposed of. What role should grant funding play in maintaining the existing system?

- *Enforcement grants* - grants are provided to local jurisdictional health departments to assist in enforcement activities at solid waste facilities, for illegal dumping and for permit reviews. Many counties no longer operate municipal solid waste landfills, however, new waste management issues are increasing. These include composting facilities, biosolids management and the change in the waste stream managed because of "delisting" of hazardous/dangerous wastes by the federal/state government and through "special designation" of hazardous waste from cleanups. Local governments are becoming directly responsible for waste that was the direct responsibility of the state. How and what type of assistance should local health departments receive through grant funding?

- *Solid waste landfill closures* - Grant funds allowed local governments to add appropriate covers and monitoring to close the facilities to the state's minimum functional standards. The long-term adequacy of these closures needs to be evaluated. Do some grant funds need to be maintained for future problems at "closed" sites?

- *Recycling and solid waste planning* - all counties have completed their solid waste plans. Curbside recycling programs are available in over 100 communities and counties. Over 70% of the population has curbside recycling available. Grants funds were provided to help get the infrastructure to this point. What will happen if that financial support is no longer there? Is the commitment to recycling strong enough to continue without grant support?

- *Remedial action grants* - many hazardous waste sites have been cleaned up using grant funds. Many more sites remain around the state. How can the grant funds be directed to local governments to assist in some of these cleanups?

CHAPTER IV

WASTE REDUCTION/RECYCLING

Washington state has established priorities for solid waste management in the *Solid Waste Management Act*, chapter 70.95 RCW (see sidebar). Waste reduction is the highest priority for solid waste management in Washington. "Waste reduction" means reducing the amount or toxicity of waste generated or reusing materials. Waste reduction can also be thought of as "source reduction" and "waste prevention".

SOLID WASTE MANAGEMENT PRIORITIES
Chapter 70.95 RCW

1. Waste reduction.
2. Recycling, with source separation of recyclable materials as the preferred method.
3. Energy recovery, incineration, or landfilling of separated waste.
4. Energy recovery, incineration, or landfilling of mixed waste.

The continued increase in solid waste generation and disposal rates requires more focus on the first priority of waste reduction. In addition, focusing efforts on major waste streams such as construction, demolition and landclearing (CDL) debris and organic materials, for both waste reduction and recycling are essential to minimizing the waste disposed.

STATE GOVERNMENT EFFORTS FOR WASTE REDUCTION/RECYCLING

Waste Reduction Measurement Methodologies

Waste reduction is the top solid waste management priority. However, it is inherently difficult to measure, and as a result few waste reduction programs have been implemented. Until waste reduction can be effectively measured it will not get the attention that it deserves. Ecology undertook a literature review to determine the various types of waste reduction measurement methodologies that are being used around the state and country. A step-by-step guidance book on measuring waste reduction, based on existing models, will be prepared in 1996. This will provide a set of methodologies for local government, business, and institutions to use for measuring waste reduction. A variety of methodologies will be provided with the uses and benefits for particular situations identified. Training for local governments, business and institutions will be provided in the appropriate use of methodologies.

Organics

Organics including food, yard waste, and other organic materials were estimated to make up 24.3% of solid waste disposed of in Washington State in 1992. Specific aspects of composting, including yard waste and food processing waste, will be addressed in the coming biennium.

Composting

Composting is considered a key element of the state's strategy of reaching the statewide 50% recycling goal. Operators expanding or developing compost facilities face unclear and potentially inconsistent regulation from various regulating entities. The Solid Waste and Financial Assistance Program is committed to clarifying existing regulations and recommending best management practice guidance to compost facility operators, health departments, municipalities and entrepreneurs. Yard waste is a significant part of the waste stream and specific technical information needs to be available.

In 1995, efforts were begun to develop a compost facility resource handbook to interpret the regulation of compost facilities under chapter 173-304 WAC, *Minimum Functional Standards for Solid Waste Handling.* The resource handbook will integrate, to the extent possible, the regulatory interpretation of solid waste, water quality and air quality rules as they apply to compost facilities, and promote baseline compost facility designs and best management practices to protect human health and the environment, referencing existing publications when appropriate. Ecology will work with and provide technical assistance to local governments and the private sector in the interpretation and use of the handbook.

In 1996, technical information will be prepared for specific aspects of yard waste composting, including handling woody yard waste via chipper days, vendor demonstrations, and coordination with power companies; land application of yard waste; yard waste processing equipment; and composting in arid climates.

Food Processing

The food processing industry primarily deals with canning, freezing and concentrating. These processes produce solid wastes in the form of pumice and sludge. The amount of this material produced is on average 2% of the material entering the plant for processing. These materials are good clean carbon sources with very little, if any, contaminants. However, these materials are potentially high in nitrogen and have a high BOD, and if mismanaged can generate groundwater pollution. In addition, if these materials are land applied too thickly, they become anaerobic and generate foul odors, in turn prompting public complaints.

The regulations and guidelines pertaining to this material are confusing and contradictory. The current regulatory posture discourages land application (beneficial use) and encourages disposal. The cost of disposal, in turn, encourages illegal handling and disposal of the

material. Some is being disposed in landfills, some is being applied to agricultural land, some is being given away as a soil amendment, a minimal amount is composted, and a large quantity is being piled illegally. Some health departments have noticed an increase of illegal handling of this material.

Some generators of this waste stream are getting it registered as a fertilizer through the Department of Agriculture fertilizer registration program. Once these materials are registered as fertilizers, the generators claim that the material is no longer a solid waste and should not be regulated as a solid waste.

In 1996, Ecology will determine the characteristics of the organic waste material from the food processing industry by using existing data from Water Quality permits and land application permits to determine the quality and quantity of material generated. In addition, Ecology will work with the food processing association to develop a survey that will help gather better data on quality and quantity of organic sludges being generated by this industry.

A guidance document will be developed to explain economical ways to manage organic wastes generated by the food processing industry (land application and composting). It will clearly spell out how this material should be handled focusing on pollution prevention, but also providing information on disposal methods. How to use the biosolids management guidelines for organic food processing wastes will either be included in the guidance document or included as a section in the compost facility resource handbook on how food sludges should be land applied.[28]

Ecology will work with the Department of Agriculture's Fertilizer Registration Program to develop a process which will inform organic waste generators that registration as a fertilizer does not always cause a material to drop out of the solid waste regulatory environment. Ecology will draft criteria to evaluate whether these registered organic wastes should be regulated as a solid waste. This criteria will address the quality of the organic material and potential environmental and human health impacts of not regulating it as a solid waste.

Working closely with the Northwest Food Processors Association and the jurisdictional health departments, Ecology will establish a guidance document on how to permit the land application of these organic waste materials.

Waste Reduction/Recycling in State Government

Under the 1989 "Government Options to Landfill Disposal" (G.O.L.D.) mandate, Ecology and the Department of General Administration (GA) worked together to assist

[28] Guidelines and regulations for biosolids deal only with material produced at municipal wastewater treatment plants. The food processors, fearing more stringent regulations, lobbied not to be included in any of the biosolids statute (chapter 70.95J RCW). Therefore, the only place in the regulations which pertain to this waste material is the land disposal section (WAC 173-304-450) which was designed for municipal solid waste compost and is too onerous for this material.

state facilities in implementing waste reduction and recycling programs. State facilities were required to reach a 50% recycling rate by 1995.

Ecology helped state facilities write and implement their G.O.L.D. plans. GA tracked the progress state facilities made in waste reduction and recycling. Sixty-two (62) of the 90 state facilities submitted G.O.L.D. plans to Ecology. During the reporting period of July 1, 1994, to June 30, 1995, half of the state agencies reported a recycling rate of 50% or above. The statewide recycling rate for state agencies was 37%. Because of budget reductions, Ecology and GA have discontinued the G.O.L.D. program. Individual agencies have been encouraged to continue their waste reduction and recycling program.

In the next biennium, Ecology will continue assisting state agencies in the implementation of waste reduction, recycling and procurement activities. Past efforts at providing assistance to state agencies have been difficult because Ecology had not thoroughly developed its own waste reduction, recycling and procurement program.

Ecology's first priority will be to improve its own waste reduction, recycling and procurement methods. As Ecology continues to improve and find success in its own program, it will provide assistance to other state agencies in the form of information sharing and providing some technical assistance as requested. It is anticipated that tracking and reporting what has and has not worked at Ecology will assist us in developing a future plan with significantly more outreach to other state agencies.

Ecology will be identifying barriers to waste reduction and recycling in our agency by using surveys developed by other states and modified for Ecology's use. Waste reduction and recycling will be measured by conducting waste characterization studies. Ecology will be tracking and reporting waste reduction, recycling and procurement information. Costs associated with recycling will be evaluated.

Specific waste reduction techniques, such as installing equipment to reduce the volume of foodwaste from the headquarters building cafeteria, will be investigated. Agency-wide policies emphasizing electronic information transfer will be instituted to encourage paper reduction.

Ecology is a charter member of the Green Seal Organization and has adopted Green Seal policies to improve the agencies procurement of recycled and environmentally friendly products. Ecology will be encouraging other agencies to also procure environmentally friendly products.

Activities, successes and failures at Ecology will be shared by giving presentations at local government recycling coordinator meetings and issuing a regular newsletter to other state agencies. Ecology's bi-monthly newsletter to all state agencies will describe our activities and encourage other state agencies to improve their own waste reduction, recycling and procurement programs. Ecology will provide outreach to those agencies who call for

assistance. Outreach will be limited to helping agencies use methods developed by Ecology and modified to their own needs.

Construction, Demolition, and Landclearing Waste

In 1993, Ecology proposed to develop and implement a strategic waste management program to target construction, demolition, and landclearing debris (CDL) reduction and recycling opportunities. CDL is the term commonly used to define the waste stream generated from various site preparation, building, and demolition activities. The *1992 Washington State Waste Characterization Study* estimated CDL to comprise approximately 13-17% of the total disposed waste stream. More recent studies estimate the actual amount disposed in Washington State landfills could exceed 30%; however, generation figures could range from 50 -70% of the total waste stream accounting for on- and off-site recycling, reuse including commercial salvage, burning, burying and illegal disposal.

Generally, CDL includes clean and treated wood waste, dimensional lumber, gypsum board, roofing shingles and associated waste, asphalt, concrete, brick and other aggregates, metals, plastics and tree stumps. The waste from construction sites may also include a significant amount of packaging waste including cardboard, plastic wrap and wood pallets from materials supplies.

The Strategic Plan, released in January 1994, for CDL was developed in consultation with local governments and other interested stakeholders, and in cooperation with the Clean Washington Center. The following is a brief summary of the proposed tasks and highlights of the program's success.

- **Formed the Western Washington CDL Regional Coordinators Group** - comprised of representatives from Ecology, the Energy Office, the Clean Washington Center, and cities and counties with a common mission to reduce and recycle waste and use recycled-content products in construction.

- **Information Gathering Forums** - focus groups for major builders, developers, trade associations, and architectural firms. Topics included identifying programs or services which were planned or already available to the industry, and a description of programs, products or services which could be provided. Discussions identified activities most useful to this audience, barriers to waste reduction or pollution prevention strategies and/or recycling program development, and the best approach to solicit participation from the industry in sustainable construction.

- **Resource Center** - ***Environmental Works Sustainable Building Resource Center and Database Specifier*** - a database for architects and contractors standard Construction Specifications Institute numbers which allows quick access to alternative building product information and specifications. Following the

investigation and database review, a collection of specifications can be printed for direct project application.

The information can also be displayed using graphic "building components" familiar to homeowners and remodelers. The various displays take the user through a standard home and through the use of a computer mouse allows the user to "click" on building components of particular interest. The database automatically calls up the product information and specifications data relevant to that particular component. The database also includes information on organizations involved in sustainable building and publications relevant to this field.

- **Waste Reduction/Recycling Directory Database** - A dedicated subsection of the 1-800-RECYCLE database was developed for CDL information files. Callers can now receive information about CDL material recyclers and reuse/salvage vendors operating in the state.

- **Education and Outreach** - The CDL Regional Coordinators Group train each other on new techniques and practices promoting waste minimization and recycling and plan to target select trade associations to introduce the information collected and provide a source of referrals and references to the industry.

- **Technical Assistance** - a comprehensive regulatory guidance document for construction contractors will be prepared. Outreach by the CDL Regional Coordinators Group will focus on areas in the state where local efforts to reduce and recycle CDL are minimal. Ecology focuses technical assistance on trade association and construction companies such as the Northwest EcoBuilding Guild.

- **Fact Sheets for Technical Information** -Two guidance fact sheets were developed in June 1994 to clarify the *Minimum Functional Standards for Solid Waste Handling* (chapter 173-304 WAC) related to CDL material disposal at inert-demolition waste landfills, and at woodwaste landfills. Each fact sheet defines the acceptable materials allowed in these landfill-types, which of the MFS requirements apply to these landfills, operation and closure requirements, and record keeping and reporting requirements. These fact sheets have been distributed to local health and solid waste departments. In addition, a third fact sheet was prepared which outlines the MFS requirements for waste recycling facilities. A fact sheet for proper gypsum (sheetrock) disposal is planned for 1996.

- **Sustainable Construction Demonstration Project** - ***SmartScape*** - a three year project to replace the water-intensive landscape at Ecology's Northwest Regional Office building was completed in 1994. The new landscape demonstrates a sustainable alternative for commercial building complexes. The landscape conserves water, is low-maintenance and requires no chemical fertilizers or insecticides for maintenance.

Recycling Information Line

Ecology operates 1-800-RECYCLE to help citizens find ways to reduce waste and recycle. Information includes: backyard composting techniques, disposal options for household toxic materials, and suggestions about alternative products posing less of a threat to human health and the environment. The most frequently asked questions by households are about plastics, construction demolition wastes, metals, paper, and household toxic material.

In 1994, the Information Line answered 44,271 calls, compared to 86,196 in 1993. Factors contributing to this decline include: more curbside collection programs, more drop box locations, education efforts and the existence of local recycling hotlines in about 15 cities and counties. Based on the number of days the Information Line was opened for business, the average calls answered per day was 175. During Christmas Tree Disposal Season, the Information Line answered 1,327 calls for December 1994, and 1,597 calls for January 1995, for a total of 2,924 calls regarding Tree-cycling for a two-month period. The highest number of calls answered in one day was 894 during Christmas Tree Disposal Season.

Budget reductions to Ecology from the Litter Account Funds have resulted in reduced staffing of the 1-800-RECYCLE Information Line for 1996.

Ecology also operated a 1-800-LITTERS Hotline for citizens to obtain information about the litter program or to report litter violators. Litter violators were identified by the license number and vehicle description. An information letter explaining that littering is against the law, and a litter bag, were sent to those individuals. In 1994, the Information Line took 1,746 reports of the litter violations for that year. Because of the budget reductions in Litter Account Fund to Ecology, the Litter Hotline was terminated July 1, 1995.

Ecology Youth Corps

Ecology Youth Corps (EYC) cleaned up and recycled over 2,552 miles of Washington roadways in 1995, it's 19th year of operation under chapter 70.93 RCW, *the Waste Reduction, Recycling and Model Litter Control Act.*

Most of EYC's efforts occurred during the summer sweep in July and August. Twenty seven crews of youngster 14 to 17 years of age bagged 156 tons of litter. They turned in 4.16 tons of aluminum cans, 5.8 tons of glass and bottles, 1.7 tons of plastic and cardboard, and 2.4 tons of scrap metal to recycling centers in Washington.

Another 22.6 tons of litter were collected from state parks, rest areas, wildlife and recreation areas, city streets, beaches, and illegal dump sites. EYC has been working with other state agencies, such as the Department of Fish and Wildlife, and county public works offices around the state to help in the effort to maintain areas of heavy public use.

A-Way With Waste Curriculum

The *A-Way With Waste* curriculum, first developed in 1985, is a K-12 multi-disciplinary classroom activity guide that includes lessons on waste reduction, recycling, landfilling, incineration, litter control, hazardous waste management and household hazardous wastes. Teachers can attend a one day training session on the use of the curriculum. Over 10,000 Washington teachers have attended A-Way With Waste workshops since 1985. Because of budget reductions at Ecology this program is no longer being conducted through the Solid Waste and Financial Assistance Program.

RECOGNIZING WASTE REDUCTION AND RECYCLING EFFORTS

School Awards Program

The School Awards Program provides cash awards to public schools for their waste reduction and recycling programs. Ecology also provides technical assistance to schools and school districts to help them develop and implement waste reduction and recycling programs.

The awards program has three categories: Best Waste Reduction Program, Best Recycling Program, and Outstanding Waste reduction and Recycling Programs.

All 1,760 public schools in Washington state are eligible to apply for the school awards program. Schools win cash awards for their outstanding waste reduction and recycling activities. Seventeen schools won awards presented at the Capitol Rotunda in Olympia on May 8, 1995.

The Best Waste Reduction Program Winner: Trout Lake Middle School $2,500

Trout Lake Middle School in Klickitat County practices a variety of waste reduction and toxicity reduction techniques. They reuse cardboard boxes for stage play scenery, artwork, and storage; write assignments and lessons on blackboards instead of using paper, use scratch paper for classwork; photocopy on both sides of the paper; reuse cloth backdrop for costumes and props; reuse mailer envelopes; take food wastes, old newsprint and sawdust from shop class as bedding and food in the worm composting bins. Their five bin composting project reduces cafeteria food wastes by 25 pounds per day. The custodian practices toxicity reduction by purchasing less toxic or non-toxic cleansers, and shampoos. The septic system is designed with several tanks, pumps, and a sand filtering system so that the water is almost potable when released into the environment.

The Best Recycling Program Winner: Riverside Middle School $2,500

At ***Riverside Middle School in Spokane County***, students and staff recycled white paper, cardboard, mixed paper, aluminum, tin cans, three types of plastics, yard wastes, and motor oil, for a total of 44,378 pounds of materials between September 1, 1994 and March 1, 1995. This included over 4,000 pounds of white and computer paper, 20,000 pounds of cardboard, 10,120 pounds of mixed paper, and 330 gallons of motor oil

Outstanding Waste Reduction and Recycling Awards

In the "Outstanding Waste Reduction and Recycling Awards" category, fifteen schools won awards. Five awards each were presented to senior high schools, to middle/junior high schools, and to elementary schools. A team of judges scored the applications, and finalist schools were visited. Awards were provided on the basis of waste reduction and recycling methods, education, training, purchasing practices and innovative features. Table 4.1 lists the 1994-1995 school award winners.

Table 4.1
1994 - 1995 School Awards

Award	School	Location
Best Waste Reduction $2,500	Trout Lake Middle School	Klickitat County
Best Recycling Program $2,500	Riverside Middle School	Spokane County
Outstanding Waste Reduction and Recycling Programs ($1,000 each)	Hillcrest Elementary School	Oak Harbor
	Packwood Elementary School	Lewis County
	Onion Creek School	Stevens County
	Riverside Elementary School	Spokane County
	Friday Harbor Elementary School	San Juan County
	Shumway Middle School	Vancouver
	Jason Lee Middle School	Vancouver
	Morris Schott Middle School	Mattawa, Grant County
	Waldron Island School	San Juan County
	Lewis and Clark Middle School	Yakima
	Liberty Bell High School	Twisp, Okanogan County
	Puget Sound High School	Lacey
	Ocosta High School	Westport
	Stevenson High School	Skamania County
	Wilson Creek High School	Grant County

WASTE REDUCTION AND RECYCLING AWARDS

Each year, Ecology presents "Waste Reduction and Recycling Awards" at the Washington State Recycling Association Conference. These awards recognize a wide variety of programs being instituted by state and local governments, the private sector, non-profit groups and individuals, that show a commitment to finding ways to reduce waste or recycle material. Table 4.2 lists the award winners for 1995.

Table 4.2
1995 Waste Reduction & Recycling Awards for Local Government and Businesses

1995 WINNERS		
CATEGORY	**BUSINESS/ENTITY**	**ACCOMPLISHMENT**
Best Western Washington Waste Reduction and Recycling Government Program	Kitsap County Public Works	The county has undertaken toxicity reduction of moderate risk wastes, promoted market development by producing a directory which lists those local stores that sell recycled content products. Educational efforts target youth, consumers and those who use household hazardous products.
Best Eastern Washington Waste Reduction & Recycling Government Program	Franklin County Solid Waste	This county has initiated programs for inter-office recycling, school recycling, county-wide drop boxes, used oil collection, back yard composting, worm bin composting and household hazardous waste collection.
Best Pubic Information/Education on Waste Reduction and Recycling	Snohomish County's Recycle Week 94	A waste prevention family contract was sent to newspapers with 300 families sending back competed contracts. Radio spots were aired.
Most Innovative Waste Reduction and Recycling Approach or Program	Northwest Medical Plastics Recycling Project All-Star Recycling	The program reduces hospital wastes, develops sustainable markets for plastics, provides a cost-effective system for collecting, processing and marketing hospital recyclables.
Best Media Coverage of a Waste Reduction and/or Recycling Event	Recycled Treasure Hunt Kitsap County Public Works	A multi-media campaign reached 74,000 households in a 23 week period. Treasure hunters were directed to 20 different stores.
Special Recognition Award for an Individual	Ms. Candy S. Cox King County Commission for Marketing Recyclable Materials	Serves clients in the areas of recycling, waste reduction, and composting. Developed special projects targeting used oil and moderate risk wastes.

1995 WINNERS		
CATEGORY	**BUSINESS/ENTITY**	**ACCOMPLISHMENT**
Best Business/Commercial Waste Reduction and/or Recycling Program	Boeing commercial airplane group Boeing of Everett	The company recycles twenty different commodities including paper, aluminum, titanium, magnesium, and steel. Monies received from newspaper recycling and aluminum are donated to the Special Olympics.
Best Multi-Family Recycling Program	Navy Whidbey Recycle Naval Air Station, Whidbey Island Public Works Department	This multi-family facility, which began in 1989, serves a population of 12,000 people; including a housing project for 1,444 housing units. In 1994, 22 different commodities were recycled including cooking grease, tires, antifreeze, oil filters, paper and metal products.
Best G.O.L.D. Program	University of Washington	This G.O.L.D. program has five major elements: procurement, waste reduction, recycling, waste collection, and disposal. They presently spend 50 percent of their purchasing budget for paper products to buy recycled content paper products.
Best State or Local Government Agency Waste Reduction Program	Pollution Prevention and Industrial Recycling Program Naval Undersea Warfare Center Division	The winner uses an integrated, multi-media approach to pollution prevention. teams work on hazardous waste minimization, total air quality, total water quality, hazardous materials tracking, and hazardous material substitution and eliminated the use of all vapor degreasers.
Best Recycling or Buy Back Center	Washington Recycling	Since 1974, they have recycled 155,000 tons of materials. The company has worked with an estimated 120+ businesses, including Boeing, and the State Reformatory, General Hospital and McDonalds.

CHAPTER V

THE 1994 RECYCLING SURVEY FOR WASHINGTON

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

In response, local governments began offering its citizens various forms of recycling ranging from drop boxes to curbside collection of variety of recyclable materials. In 1994, more that 100 cities and counties offered curbside collection, while an increasing number are offering curbside collection of yard waste.

RECYCLING RATES

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

From 1987 to 1993, the measured statewide recycling rate increased from 23% to 38%. This increase had been fairly steady, with a slight dip in 1991. In 1994 the measured recycling rate remained steady at 38%. While this statewide measured recycling rate of 38% is still below the 1995 target of 50% recycling, several specific commodities have exceeded 50%:

Estimated Recycling Rate

Corrugated Paper	74%	Newspaper	74%
Non-Ferrous Metals	74%	Ferrous Metals	73%
High Grade Paper	62%	Yard Waste	59%

Concerns with the Current Methodology

Table 5.1 shows the recycling tonnage's for commodities included in the recycling survey from 1992 to 1994. The footnotes explain some of the discrepancies with individual commodities. There are several problems in obtaining all of the information needed to prepare a complete and accurate recycling survey.

Recycling survey forms are sent to recycling firms and haulers to obtain information about types, quantities, sources, and destinations of recyclable materials. However, since reporting is not mandatory and there is no penalty for not returning the information, some

firms do not respond. Others, because they want to protect the confidentiality of who purchases their materials, do not complete the entire survey which leads to difficulties in eliminating double counting. These factors make it very difficult to allocate materials correctly to counties for their recycling rates.

The response rate for the 1992 and the 1993 recycling surveys was 60%. In 1994 it fell to 47%. Included in the list of non-respondents were some very large handlers of paper and metal. Also, because of reduced funding to Ecology, the number of personnel available to conduct follow up work to increase the response rate and accuracy of reporting was reduced by 50%.

Because of the lower response rate and the reduction in personnel available to process survey information, Ecology is changing the methodology for the survey in 1995. Also, there has been increased recycling of various materials such as woodwaste, some organic materials, and construction and demolition debris that have not been included in the recycling survey in the past. While the list of commodities will not expand in the 1995 survey to include some of the new recyclable materials, Ecology will be considering new categories of materials for the 1996 survey. Changes in the survey methodology, as discussed later, will seek to improve all aspects of the survey.

Table 5.1
State Tonnage By Commodity:
1992, 1993 and 1994 Washington State Recycling Surveys

Commodity	1992	1993	1994
Response Rate	**60%**	**60%**	**47%**
Newspaper	219,227	208,603	209,415
Corrugated Paper	468,317	329,670	382,996
High Grade Paper[1]	79,574	81,037	61,931
Mixed Waste Paper[1]	160,211	193,386	173,055
Aluminum Cans	18,732	18,132	16,375
Tin Cans	16,720	17,256	18,519
Ferrous Metals[2]	662,824	796,042	772,295
Nonferrous Metals	57,284	71,079	99,827
White Goods[3]	126,540	112,418	10,304
Refillable Beer Bottles	492	432	573
Container Glass	55,629	66,283	64,980
PET Bottles[4]	1,762	1,982	3,502
HDPE Containers[4]	2,437	3,117	7,827
LDPE Plastics[4]	1,860	1,275	6,087
Other Recyclable Plastics[4]	4,746	5,075	11,693
Vehicle Batteries	19,604	14,975	19,128
Tires	12,784	31,248	53,119
Used Oil	1,845	1,835	2,050
Yard Waste[5]	157,673	320,821	319,232
Food Waste[5]	38,624	69,996	126,409
Wood Waste[5]	30,181	77,116	93,318
Textiles (Rags, Clothing, Etc.)	10,061	15,360	12,440
Gypsum	3,605	34,177	27,598
Photographic films	9	468	23.62
Other rubber materials	20	0	0
Total recycled	2,150,761	2,471,783	2,492,697
Total disposed[6]	3,945,287	4,041,168	4,106,228
Total generated	6,096,048	6,512,951	7,078,404
Recycling rate	35.28%	37.95%	37.77%

[1]Mixed Waste Paper and High Grade Paper fell significantly because two very large handlers of these commodities did not report.

[2]Ferrous Metals fell somewhat from last year because several large handlers of these materials did not report.

[3]White Goods numbers fell because many handlers are now reporting them with Ferrous Metals.

[4]All the Plastics categories increased this year with high reporting rates. This appears to be because of good markets, aggressive marketing of materials, and the promise of curbside collection for some materials. In addition, the handlers of these materials report at a better rate.

[5]Organic materials are increasingly being processed in composting or for other soil amendments. Ecology is also seeing a significant reduction of wood wastes at landfills. The actual number of tons of wood waste is likely higher, however, the current methodology did not survey all possible recyclers in this area.

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

CHANGES IN RECYCLING SURVEY METHODOLOGY FOR 1995

Their have been problems in the recycling survey for some years. The methodology used from 1989 until 1994 would work very well if every business responded with very accurate information. This has never been the case. Returned forms often are incomplete or inaccurate. Ecology staff would need to make follow-up phone calls to get non-respondents to send in forms as well as call the respondents to correct inconsistencies and to complete data. Since the response rate has never been above 60% and the workload associated with the existing survey can not be sustained with the reduced staffing, Ecology sought to find solutions to make the survey more accurate and timely.

Process and Participants

Ecology staff, with assistance from the Washington State Recycling Association (WSRA), convened a group of recycling representatives to assess the recycling survey. A group of WSRA board members met to discuss the need for survey improvements, WSRA's involvement, and the process. Together, WSRA and Ecology organized the group and conducted four meetings to develop methods to improve the survey.

Committee participants were chosen to represent both data providers and report users. The diverse group of nearly 20 stakeholders came from local jurisdictions across the state, affected industry groups, companies handling surveyed commodities, and other users, such as the Clean Washington Center

Other interested parties were kept informed and involved throughout the process. Mailings of agendas and minutes were sent to counties and cities throughout the state, and to processors, brokers, and end users. The WSRA newsletter also provided a forum for updates.

Identifications of Problems with the Current Survey

The committee first identified problems with the current survey. Problems identified by survey users included inaccuracies of the data reported, lack of confidence in the numbers, low response rate (50-60%), and long lag time from data collection to the year that the report is published (up to 2 years). Problems identified by suppliers of data included confidentiality about sellers and buyers, and the burden of reporting either as a result of disclosing proprietary information or specific data not kept in a format required on the survey form.

New Methodology for Survey

Through the efforts of the committee, a new methodology for the survey has been designed. This methodology was developed by examining how materials move and are tracked, and where data can be collected. Private businesses and public sector entities that collect surveyed materials from residential or commercial sector *generators* will be surveyed, along with end users of materials. Brokers and processors will only be asked to fill out the survey if they collect material directly from generators. The end-user information will be used to calculate a statewide figure. The generator based figures will be used to calculate more detailed county numbers. Entities that collect from generators will be asked to identify percentages of material for each county, and to identify the percentages that are residential vs. commercial

This methodology should improve the ability to determine both statewide and county recycling rates, and preserves information about commercial and residential recycling for a variety of materials. It also simplifies the approach. It focuses the number of businesses required to respond and allows respondents to make estimates when actual numbers are unavailable. It should decrease data reporters' concern about confidentiality, since the survey no longer asks specific questions about sources or buyers.

One last aspect of the new methodology will be to assess the materials list and revise as necessary. The list will remain the same for the 1995 report. This is to maintain consistency for measuring the 50% recycling goal in the Waste Not Washington Act. In the future, materials may be combined into one reporting category, some single materials may be split into two or more, and some new materials may be added. All changes will be made to more accurately characterize the waste stream and to provide information to local government and business for solid waste planing and market development.

Local Assistance

Local government staff will be recruited to work with local companies to help them understand the methodology changes, and to improve the response rate in their areas. It is hoped that with local jurisdictions and Ecology working in partnership on this new methodology, that the response rate to the survey and the accuracy of numbers will increase.

A number of jurisdictions, including Spokane and Pierce County, currently conduct their own survey because of discrepancies between state and local information and the long lag time in receiving the state survey report. The response rate for these local surveys is often higher than for the state survey. However, it can be a burden for businesses to respond to multiple forms asking for similar (but not identical) information at different times of the year. It is hoped that the new methodology and process will eliminate the need for jurisdictions to conduct their own survey.

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. Waste exported for disposal to Oregon is also included in this discussion.

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 the MFS, in January 1995, forms were sent to the various types of landfills[29] 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 and other. The facilities were also asked to report the source of their waste, by county, out-of-state or out-of-country. The information provided below is from the landfill reports.

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

Some waste generated in Washington is disposed of in landfills in Oregon. Information obtained from two regional landfills in Oregon is included in the following discussion.

MUNICIPAL SOLID WASTE LANDFILLS

Amount of Waste Disposed in Municipal Solid Waste Landfills

In 1994, 36 municipal solid waste landfill accepted waste totaling 3,878,615 tons. Of the 36 landfills, 29 were publicly owned, and seven were privately owned.

In analyzing the size of the MSW landfills it was found that of the 36, six received over 100,000 tons of waste in 1994, while 12 received less than 10,000 tons. Three of the

[29] Only one ash monofill is located Roosevelt Regional Landfill. Information about the special incinerator ash disposed is provided in their annual report for their municipal solid waste landfill at the same site.

largest landfills and all of the smaller landfills are publicly owned. Some of the facilities received lesser amounts of waste in 1994 than in previous years because they closed during 1994 in response to the new, more stringent state/federal regulations.

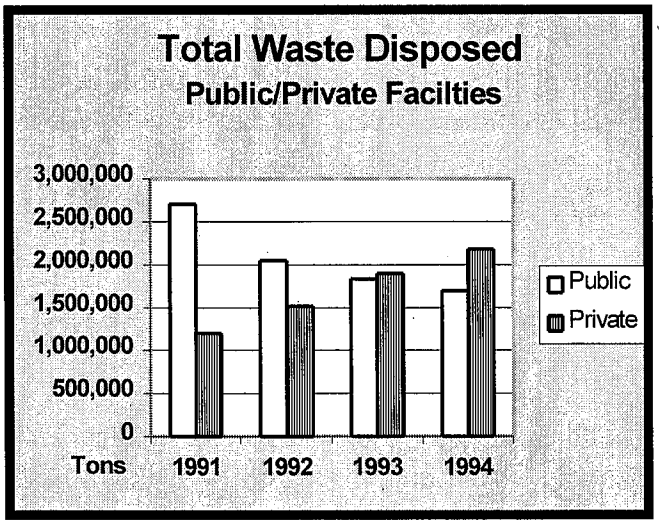
Table 6.1 depicts the relationship of waste disposed to public/private ownership. As the table illustrates, 1,696,439 tons of solid waste disposed went to publicly owned facilities (44%), with the remaining 2,182,176 tons going to private facilities (56%).

Table 6.1
Total Waste Disposed in MSW Landfills

OWNERSHIP	NUMBER OF MSW LANDFILLS		AMOUNT OF WASTE DISPOSED (Tons)		% TOTAL WASTE DISPOSED	
	1993	1994	1993	1994	1993	1994
PUBLIC	35	29	1,832,928	1,696,439	49	44
PRIVATE	8	7	1,893,127	2,182,176	51	56
TOTAL	43	36	3,726,055	3,878,615	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 6.1). 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 56% in 1994. The majority of this increased amount can be accounted for by the Roosevelt Regional Landfill in Klickitat County.

Figure 6.1
Total Waste Disposed — Public & Private Facilities



Types of Waste Disposed in Municipal Solid Waste Landfills

Traditionally, many people think of the waste disposed of in MSW landfills as being mostly household waste.[30] Annual facility reports show that a much wider variety of waste is disposed of in the MSW landfills. These wastes need to be considered in terms of remaining available capacity. Thirteen of the 36 landfills reported a significant amount of solid waste disposed, other than municipal solid waste. Demolition, industrial, commercial, woodwaste and petroleum contaminated soils (PCS) were the major waste streams. Table 6.2 summarizes the types and amounts of waste disposed of in 1991 through 1994 in MSW landfills.

Table 6.2
Waste Types Reported Disposed in MSW Landfills

WASTE TYPES	1991 (Tons)	1992 (Tons)	1993 (Tons)	1994(Tons)
Municipal Solid Waste*	3,211,857	2,694,800	2,641,551	2,725,084
Demolition Waste	191,518	250,144	331,231	459,979
Industrial Waste	189,908	101,607	44,471	150,218
Inert Waste	2,023	1,027	0	31,248
Commercial Waste	157,862	143,466	180,691	92,498
Woodwaste	39,184	60,523	98,595	22,668
Sewage Sludge	42,618	64,311	33,854	64,364
Asbestos	3,931	8,247	7,076	11,819
Petroleum Contaminated Soils	66,879	224,560	273,429	249,552
Tires	na	na	1,288	1,815
Other**	4,357	12,053	113,869	69,371
TOTAL	3,910,137	3,560,738	3,726,055	3,878,615

* 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 yard waste, auto fluff, ash, medical waste, and white goods.

In examining the types of waste that were disposed in the MSW landfills in 1994, there was a decrease in commercial, woodwaste, petroleum contaminated soils and the "other" category. Increased amounts were reported for all other waste types.

The significant decrease in woodwaste is likely a result of recycling of wood materials. Much of the increase in demolition waste was attributed to the Ft. Lewis landfill. The Ft. Lewis Military base has been demolishing old barracks and other unneeded structures as part of the military downsizing.

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

WASTE-TO-ENERGY/INCINERATION

In 1994, five waste-to-energy facilities/incinerators burned 421,626 tons of solid waste. Of that amount, 7,134 tons was identified as woodwaste at the Inland Empire Paper facility in Spokane. This is the only incinerator that does not burn municipal solid waste. The amount of solid waste statewide that was incinerated has remained stable (10%) for the past three years. One of the MSW incinerators in Skagit County closed in 1994.

ASH MONOFILL

For waste-to-energy facilities or incinerators that meet both the chapter 173-304 WAC and chapter 173-306 WAC (see in Chapter II), the ash generated from the facilities must be disposed in a properly constructed ash monofill. There are four remaining energy recovery/incinerators that meet these criteria. All of the ash (113,271 tons) from those facilities is 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. A comparison of the amount of solid waste disposed in municipal solid waste landfills and waste-to-energy facilities and incinerators in 1994 is shown in Table 6.3.

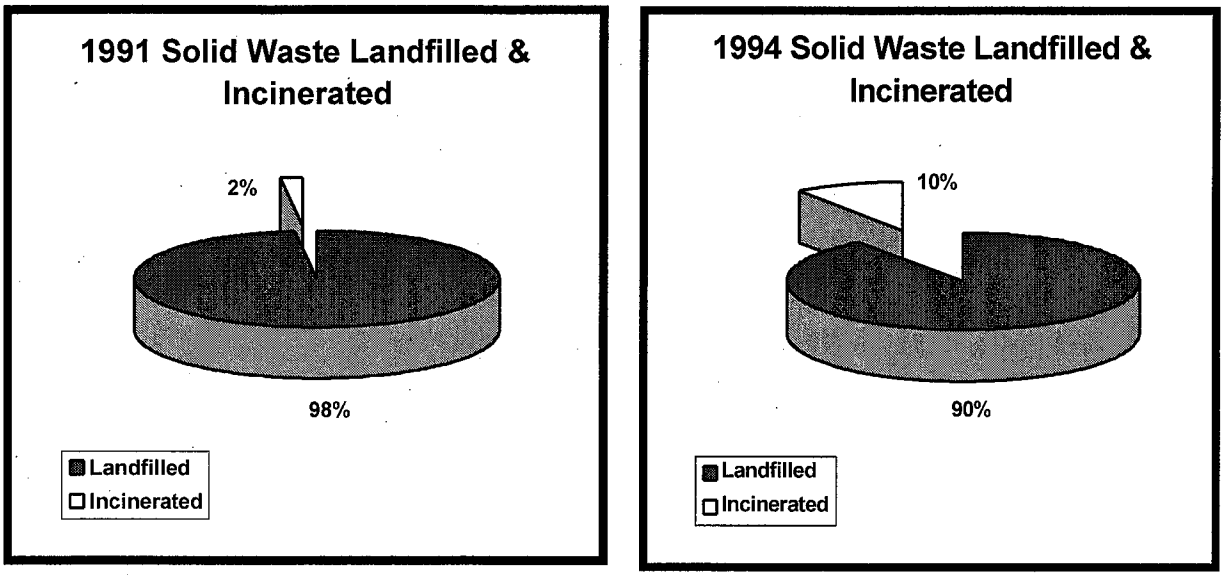
Table 6.3
Waste Disposed in MSW Landfills and Incinerators in 1994

FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	3,878,615	90
Incinerators	421,626	10
TOTAL	4,300,241	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. In 1994, the split was 90% landfilled and 10% incinerated (see Figure 6.2).

This split between waste landfilled and incinerated will likely remain stable over the next few years because no new large waste-to-energy facilities or incinerators, or expansions of existing facilities, are currently planned.

Figure 6.2
Comparison of Solid Waste Landfilled & Incinerated 1991-1994



INERT/DEMOLITION, LIMITED PURPOSE AND WOODWASTE LANDFILLS

In addition to municipal solid waste landfills, there are three other major types of landfills in the state: inert/demolition, limited purpose, and woodwaste. These three types of landfills are defined in the MFS as discussed in Chapter II. Annual report forms received from these types of landfills show a variety of waste types disposed, as seen in Table 6.4.

Table 6.4
Waste Types and Amount Disposed at Other Types of Landfills

	LANDFILL TYPE					
WASTE TYPES	WOODWASTE		INERT/DEMO		LIMITED PURPOSE	
	1993	1994	1993	1994	1993	1994
Municipal	0	0	0	0	0	0
Demolition	20,775	0	168,066	157,758	12,894	95,568
Industrial	0	0	0	0	17,680	212,008
Inert	0	0	272,047	200,172	37,274	104,419
Commercial	0	0	0	0	25,019	0
Wood	96,708	29,412	120	0	156,261	86,088
Sludge	0	0	0	0	0	21
Asbestos	0	0	12	4	0	226
PCS	0	0	16,233	19,179	99,360	82,279
Tires	0	0	500	0	0	0
Other	4,614	3,213	377,260	280,501	59,259	60,642
TOTAL (tons)	122,097	32,625	834,238	657,614	407,747	642,251

A high demand for wood products has increased the reuse and recycling of woodwastes that had been disposed in the past. This is shown in the decrease in woodwaste disposed at both municipal landfills and at the woodwaste landfills. Reduced amounts of woodwaste were also reported at inert/demolition and limited purpose landfills.

The decrease of total waste reported for inert/demolition landfills and the increase for limited purpose landfills is partially attributed to the change in classification of a major landfill. In addition, a limited purpose landfill that opened late 1993 was in full operation in 1994.

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, if they received any. Fourteen of the 36 active MSW landfills reported receiving waste from other counties in 1994.

Some of this waste movement was because of closer proximity to neighboring landfill, although some counties are looking to other locations for their waste disposal. Some of the waste disposed from other counties was "specialty" waste such as PCS.

With the closure of many local landfills because of the new state/federal regulations, Roosevelt Regional Landfill, and to a lesser extent Oregon regional landfills, have become the chosen disposal option. The Roosevelt Regional Landfill in Klickitat County, received some types of solid waste from 26 of the 39 Washington counties, six additional counties since 1992, and also from out-of-state and out-of-country. 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 future local landfill capacity. Eleven of the 26 counties currently rely on Roosevelt for their solid waste disposal. Four other counties and the City of Seattle send all of their solid waste to Oregon facilities.

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 1994, a total of 67,113 tons of solid waste was imported from beyond the state's boundaries for disposal. This is less than 1% of the waste disposed and incinerated in Washington.

The majority of this waste went to two municipal landfills and a small amount of MSW went to a waste-to-energy facility. Some of the waste, such as woodwaste, asbestos, PCS and demolition waste was also imported to limited purpose, woodwaste and inert-demolition landfills in 1994.

The types of waste received from out-of-state for disposal are included in Table 6.5. The largest changes were an increase in PCS, mostly due to cleanups, and a decrease in woodwaste, likely because of recycling. Both of these were mainly attributed to the Roosevelt Regional Landfill.

Some of this waste, 26,265 tons from Nez Perce County, Idaho, was disposed of in the Asotin County Landfill. This type of waste disposal is considered incidental movement because of the closer proximity of Washington state landfills. In addition, 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.

Table 6.5
Out-of-State Waste Disposed in Washington

TYPE OF WASTE	QUANTITY-IN TONS			
	1991	1992	1993	1994
Municipal Solid Waste	24,475	27,114	26,993	27,330
Demolition	1.412	0	147	1,095
Petroleum Contaminated Soils	0	12,388	16,698	33,136
Industrial	0	0	0	4,269
Asbestos	0	41	735	206
Sludge	36	34,457	0	33
Woodwaste	208	27,492	24,486	120
Other	0	0	0	924
TOTAL	26,131	101,492	69,059	67,113

While the amount of waste imported for disposal has decreased in 1992, this trend will not continue. Under the "Guidelines for Reporting Imported Solid Waste"[31] disposal facilities receiving waste from out-of-state are required to notify Ecology if the amount from one generator will exceed 10,000 tons per year. An equivalency determination for the state or province is required. In addition, the facility must submit quarterly reports on all solid waste received from out-of-state.

Roosevelt Regional Landfill is currently the only disposal facility falling under the reporting guidelines. They have reported for each quarter since the guidelines have been in place.

Based on the reports for the first three quarters of 1995, 92,599 tons of waste had been received form out-of-state. A portion of this MSW waste, 38,348 tons, was the initial quarterly receipt of waste from major California long-term contracts, estimated to average 250,000 tons per year. Other long-term contracts for MSW waste are in place, or being negotiated for two Alaskan communities and communities in British Columbia. Other short-term or less amount contracts are also in place or are being sought by the facility.

[31] *Guidelines for Reporting Imported Solid Waste*, Department of Ecology, Publication #94-140, September 1994.

Waste Exported from the State

Another aspect of waste disposed is the amount that is exported from Washington to another state for disposal. In 1994, 770,514 tons of waste generated in Washington was disposed in Oregon landfills, an increase from 705,608 tons in 1992. Table 6.6 shows a comparison of the waste amounts and types exported, compared with that imported.

Major exporters of municipal solid waste in Washington included the city of Seattle (446,182 tons), Clark County, Pacific County, Island County, Benton County and Whitman County. Reasons for exportation out-of-state are related to the closure of local landfills, and negotiation of favorable long-haul contracts with Oregon facilities.

Table 6.6
Comparison of Imported-to-Exported Waste to all SW Facilities

TYPE OF WASTE	IMPORTED		EXPORTED	
	93	94	93	94
Municipal Solid Waste	26,993	27,330	710,515	737,309
Demolition	147	1,095	2,245	11,130
Petroleum Contaminated Soils	16,698	33,136	22,308	7,555
Asbestos	735	206	1,623	2,709
Indusrial	0	4,269	864	3,034
Woodwaste	24,486	120	0	0
Sludge	0	33	0	2,834
Other	0	924	18,512	5,943
TOTAL	69,059	67,113	756,067	770,514

DETERMINING THE AMOUNT OF SOLID WASTE DISPOSED

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.

Waste Generated by Washington Citizens for Disposal at MSW Facilities

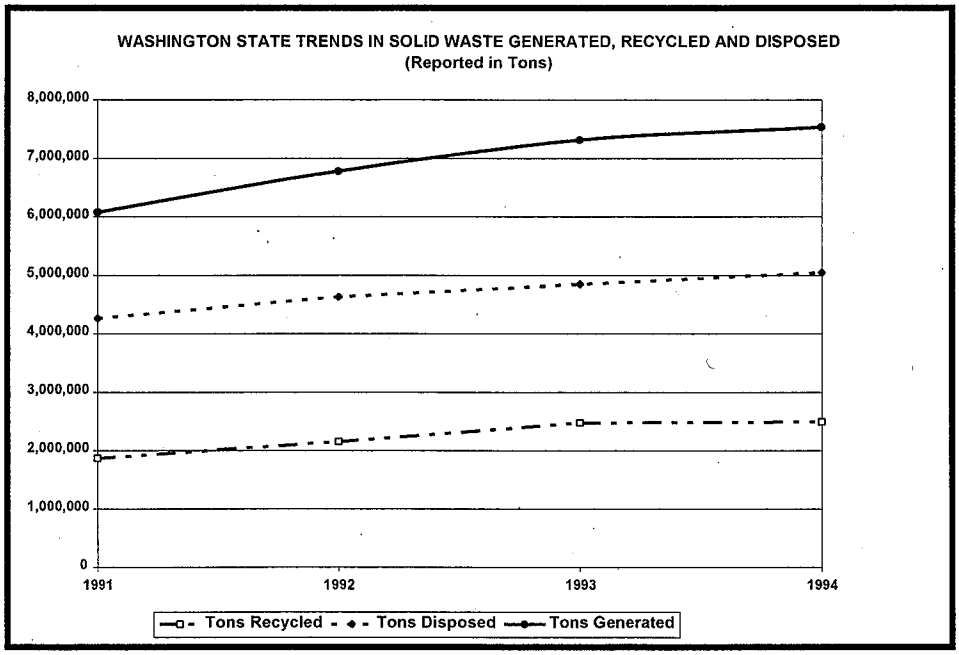
Since 1987, Ecology has conducted a recycling survey that has reported the amount of waste generated, recycled and disposed each year. This waste stream was the "recyclable waste stream" made up of waste types included in the recycling categories, but not including sludge, asbestos, petroleum contaminated soils, construction and demolition, or industrial waste (when it could be specifically identified[32]). It was also typically the waste stream generated and reported by municipalities (cities and counties). The report

[32] 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 waste.

for the recycling survey included waste that was disposed of outside of Washington and excluded imported waste.

Figure 6.3 shows the amount of waste recycled, disposed and generated in Washington. It is based on waste disposed at Washington MSW landfills and incinerators, including Washington waste disposed of in Oregon, but excluding imported waste. All types of waste are included in the disposal numbers. The trend seen is an increase in all of the amounts generated, recycled, and disposed.[33]

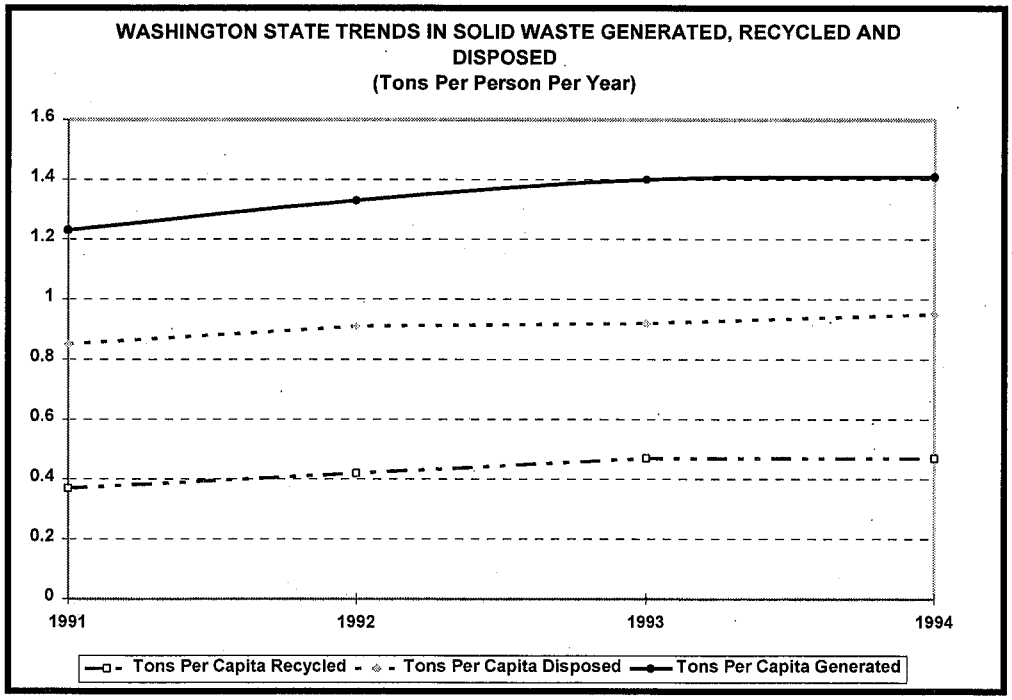
Figure 6.3
Washington State Trends in Solid Waste Generated, Recycled and Disposed
(Reported in Tons)



[33] The amount recycled in 1994 is likely low because of a poor response rate (47.9%) to the recycling survey.

Figure 6.4 is an analysis of 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. All categories are increasing. It needs to be remembered that this 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.

Figure 6.4
Washington State Trends in Solid Waste Generated, Recycled and Disposed
(Tons Per Person Per Year)



As the population continues to increase, waste generation will continue to increase. That is why the current emphasis on household recycling should continue and an increasing emphasis on waste reduction by the residential sector and waste reduction and recycling by the commercial and industrial sector needs to become a priority.

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, 5,632,731 tons of waste was disposed of in all types of landfills and incinerators in Washington in 1994 (see Table 6.7).

Table 6.7
Total Amounts of Solid Waste Disposed in Washington, 1993

	AMOUNT OF WASTE (TONS)		
DISPOSAL METHOD	1992	1993	1994
Municipal Solid Waste Landfills	3,560,738	3,726,055	3,878,615
Incinerated MSW Waste	424,387	431,928	421,626
Woodwaste Landfills	181,494	122,097	32,625
Inert/Demolition Landfills	905,088	834,238	657,614
Limited Purpose Landfills	383,115	407,747	642,251
TOTAL	5,454,822	5,522,065	5,632,731

REMAINING CAPACITY

Future Capacity at Municipal Solid Waste Landfills

Increased standards required by chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*, resulted in the closure of 22 municipal solid waste landfills since 1991. Those that had little or no remaining capacity determined not to expand because of the expense in meeting the new requirements. Others, although they had some remaining capacity, decided to close rather than upgrade to meet the new requirements. Those facilities accounted for less than 1% of the estimated remaining permitted capacity reported in 1994. Only 23 MSW landfills remained operating at the end of 1995. (See Map A for the location of operating MSW landfills and incinerators.)

The amount of remaining capacity for the 23 MSW landfills was determined by asking the facilities to report remaining permitted capacity, as well as the expected closure date. In 1995, the facilities estimated about 177 million tons, or 45 years, of capacity at the current disposal rate. Last year, facilities reported approximately 181 million tons of remaining capacity, about 49 years of remaining capacity statewide.[34] Of the 23 currently operating landfills, only 14 have an estimated 10 years of remaining capacity. (See Table 6.8 for an estimated number of facilities with specified remaining years of life.) Map B shows the counties and the remaining years of capacity of their MSW landfills.

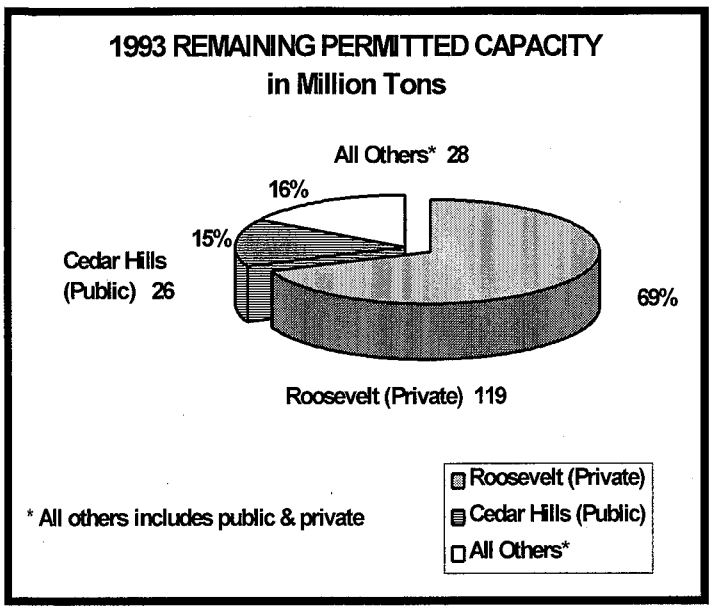
Table 6.8
Estimate Years to Closure for MSW Landfills

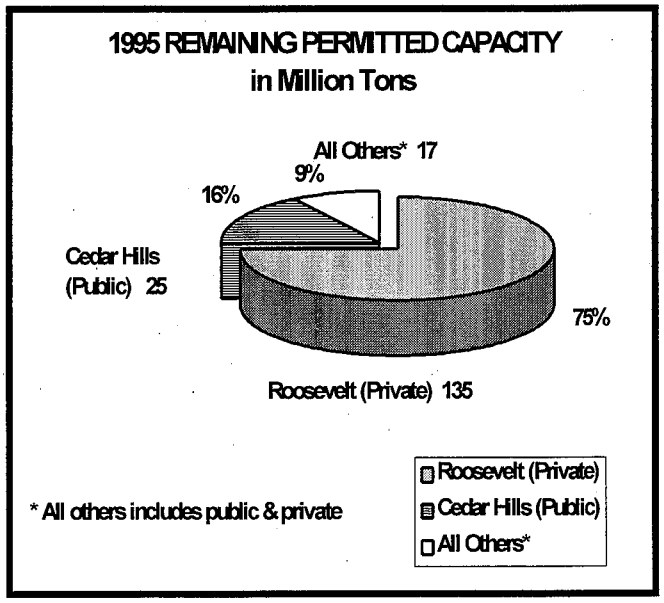
YEARS TO CLOSURE	NUMBER OF FACILITIES	PUBLIC	PRIVATE
Less than 5 years	4	2	2
5 to 10 years	5	5	0
Greater than 10 years	14	10	4
TOTALS	23	17	6

Seventeen of the 23 operating MSW landfills are publicly owned. However, 80% of the remaining permitted capacity is at the six privately-owned facilities, compared to 73% in 1993. The majority of the capacity, about 75% of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 16% of the statewide total capacity is at the publicly-owned Cedar Hills Landfill in King County, with the remaining 9% of capacity spread among the remaining 21 landfills in the state (see Figure 6.5).

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

Figure 6.5
Comparison of Remaining Permitted Capacity
1993-1995



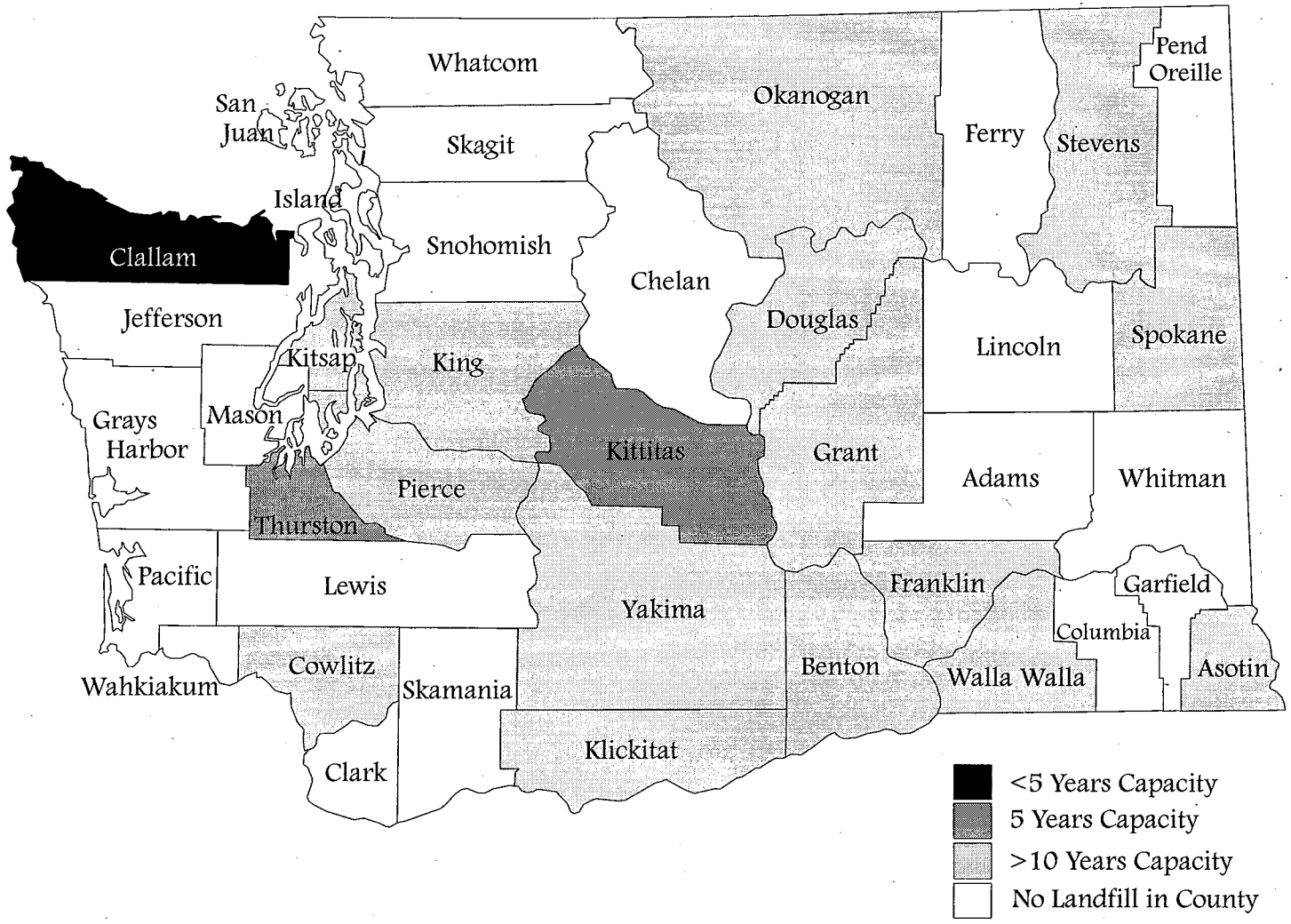


Besides the amount of remaining capacity, availability of that capacity needs to be considered. The Roosevelt Regional Landfill is operated to be a landfill that accepts waste from a wide variety of locations. In 1994, the facility received some type of solid waste from 32 counties in Washington, including all of the solid waste from 11 counties, five other states and British Columbia, Antarctica and Guam. 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 45 years of total capacity is based on the amount of waste disposed in MSW landfills in 1994. 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 that is currently being 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). If requirements for other types of landfills (woodwaste, inert/demolition, and limited purpose) become more stringent in the future, some of those facilities may close and there may be an additional shift of the types of solid waste moving to the MSW landfills for disposal.

MAP A: Location of MSW Landfills and Energy Recovery Facilities

MAP B: Remaining Permitted Capacity in MSW Landfills



Changes in the state *Model Toxics Control Act* and in Federal and State hazardous waste regulations are also adding to waste volumes ending up in MSW landfills. These changes are as follows:

- Some cleanup wastes that otherwise would qualify as "state-only" dangerous waste may be allowed to be disposed of in a solid waste landfill meeting the new standards of Chapter 173-351 WAC. These wastes would have to be the subject of a consent decree and their disposal or treatment approved by Ecology as protective of human health and the environment.

- In addition, the U.S. Environmental Protection Agency is currently evaluating their definition of hazardous waste. It is very likely that in the coming years, some wastes formerly listed as hazardous will be "de-listed" and will be moved into the solid waste area. This includes contaminated media (soil or groundwater) associated with corrective action under hazardous waste regulations.

- Additional sources of waste for disposal in the solid waste infrastructure will occur from the regulatory reform process for the state *Dangerous Waste Regulations*, chapter 173-303 WAC. This process evaluated dangerous wastes that are regulated at a level beyond the federal definition of hazardous wastes. For these "state-only" wastes it was determined that, because of the more stringent requirements of the new state/federal regulations for municipal solid waste landfills, and with the proper handling, these waste could be disposed of safely in MSW landfills and some ground water and soil (media) associated with hazardous waste.

MODERATE RISK WASTE

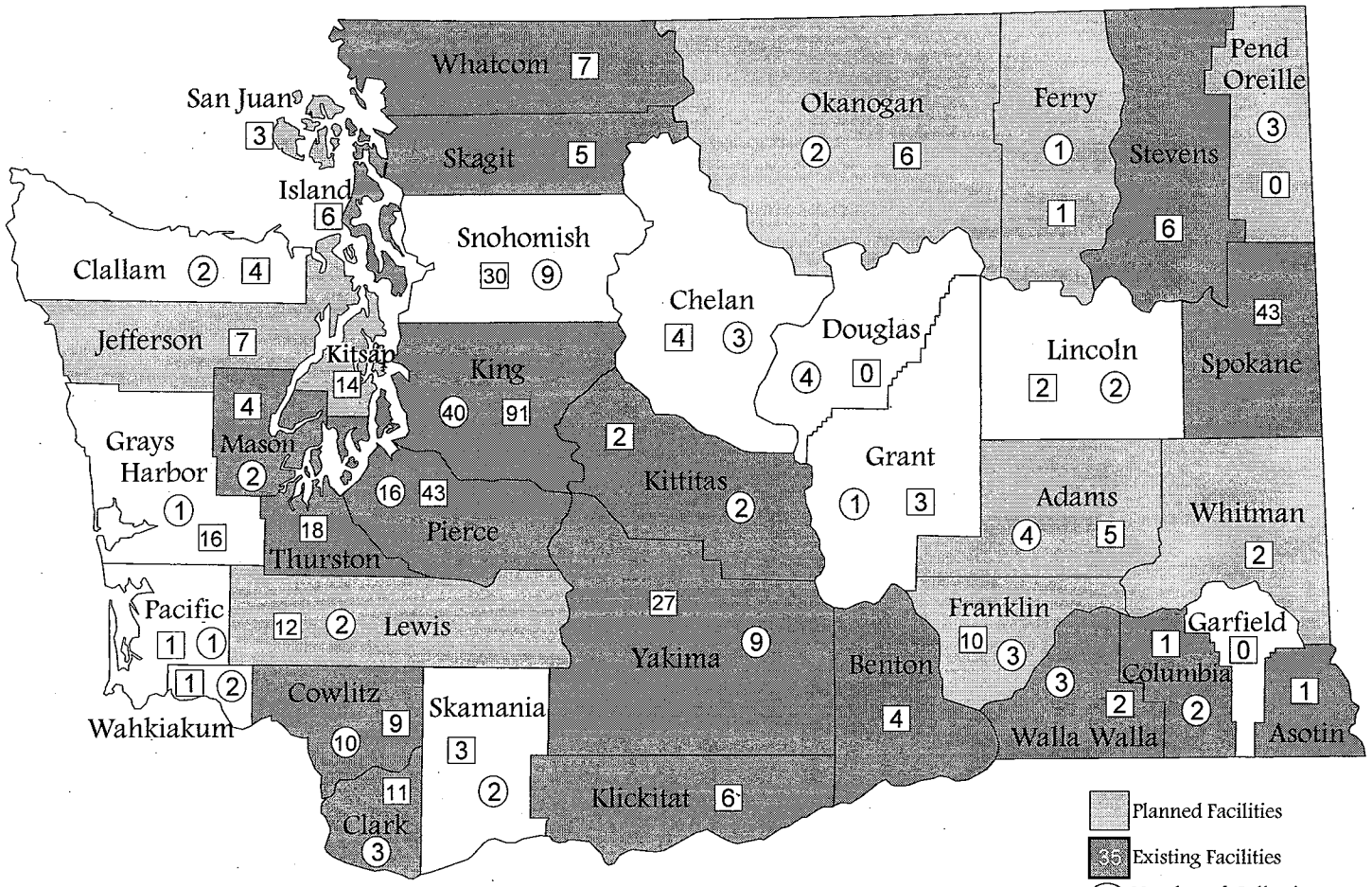
Statewide Summary of MRW Collection System as of the end of 1994

Map C summarizes the moderate risk waste (MRW) collection system in Washington as it existed at the end of 1994. This includes the number of MRW collection events held per county, including mobile MRW collection activities, as well as planned and existing MRW and used oil collection facilities.

In 1994, there were 129 collection events, including mobile collections.[35] For comparison, in 1993, there were 70 collection events reported, and an additional 53 collection events for mobile facilities, for an equivalent total of 123 collection events. In 1994, some counties curtailed their collection events in anticipation of fixed facilities that had not yet begun operations.

[35] In 1994, the collection event count per county included mobile collection activities, which were formerly counted as a separate kind of collection activity.

MAP C: 1994 MRW Collection Systems



MRW facility is defined as a location where MRW is collected at least monthly.
Portions of Whatcom, Clark, Benton, and Snohomish counties have curbside oil collection.

At the end of 1994, 18 counties had operating MRW fixed facilities, with seven of these counties having more than one per county. Some accept only household hazardous waste (HHW) while others accept HHW and Conditionally Exempt Small Quality Generator (CESQG) wastes. Most also accept used oil. This includes public and private operations.

At the end of 1994, there were 35 fixed facilities accepting MRW, which is more than the number of landfills accepting MSW. This is an increase from 1993, when there were 33 MRW fixed facilities operating. Facilities in Pend Oreille, Franklin, Whitman, and Jefferson Counties opened in 1995. Lincoln, Adams, Lewis, Yakima and Kitsap Counties expect to have MRW fixed facilities operating in 1996.

The used oil collection system dramatically expanded in 1994, to 410 sites from the 1992 estimate of 280 sites. As shown on Map C, the used oil collection sites are well distributed across the state. It is estimated that to meet the legislative goal of 80% used oil recycling that there is a need for approximately 1,000 sites statewide.

Estimated Moderate Risk Waste Collection

Table 6.9 shows the tabulated results submitted by public collection centers of MRW. The waste quantities are all converted into pounds and are segregated into four categories; these are Household Hazardous Waste (HHW), Oil Collection Centers, Small Quantity Generator (SQG) waste, and Mixed Waste (programs that take both HHW and SQG wastes). For each waste type, the reported final disposition of the waste is also shown.

The total for all MRW collected in 1994 was 11,751,204 pounds. The vast majority of this waste was reported to be recycled or reused, about 9.2 million pounds. Approximately 1 million pounds of the collected MRW was used for energy with almost that much going to hazardous waste disposal. More jurisdictions in 1994 were now offering to collect SQG wastes and therefore reported their waste quantities as mixed.

The total amount collected was approximately 2.7 million pounds less than reported in 1993. This may be because of a number of factors including: overestimates made in the 1993 report, the fact that at least 6 counties were in the process of planning or building fixed facilities and were not typically holding their collection events, or a combination of these factors. Also, Snohomish County moved their used oil collection infrastructure inside or had attended used oil collection. This resulted in a significant drop in oil collection. Some possible explanations for this may be that small businesses were using these unattended sites, which were clearly designed for households, or perhaps the attended sites are simply less convenient or more imposing for the public to use.

The state sponsored contaminated used oil collection program for facilities that accept oil from the public has continued and is being used by jurisdictions throughout the state.

Table 6.9 MRW Quantities Collected in 1994 (pounds) By Waste Dispostion and Waste Category							
	HW Disposal	Recycle/ Reuse	Energy Recovery	Treated/ Landfilled	Treated/ Sewered	Other	Totals
HHW							
Aerosols	252		12,981				13,233
Antifreeze	62,150	47,808	12,155			2,517	124,630
Cfc/freon		60					60
Corrosives	9,492			667	21,113		31,272
Dry cell batteries	28,940			1,146			30,086
Flammable gas	8,809						8,809
Flammable liquids	213,172		334,062				547,234
Flammable solids	294		4,675				4,969
Lead-acid batteries	18,410	1,321,515					1,339,925
Oil	66,748	122,510	106,264			48,840	344,362
Oil (contaminated)		30				2,628	2,658
Oil filters		550					550
Other	22,894	8,407	2,290	1,909	163	1,854	37,517
Oxidizer	12,021			415	163	2,276	14,875
Paint (latex)		157,552	2,537	81,918		216,954	458,961
Paints oil based	125,621	2,373	156,200			1,805	285,999
Pesticides/preserv	56,144	1,251		2,403		999	60,797
Solvents	340		49,715				50,055
Oil Collection Centers							
Antifreeze		34,304					34,304
Oil		7,011,234	16,576				7,027,810
Oil filters		12,000					12,000
Mixed							
Adhesives	26,800		4,753				31,553
Aerosols	890	340	1,149	1,217			3,595
Antifreeze	12,255	57,148					69,403
Corrosives	4,781		1,266	1,218	5,340	80	12,684

Table 6.9 MRW Quantities Collected in 1994 (pounds) By Waste Dispostion and Waste Category							
	HW Disposal	Recycle/ Reuse	Energy Recovery	Treated/ Landfilled	Treated/ Sewered	Other	Totals
Dangerous when wet	40						40
Dry cell batteries	28,660		270	720		1,305	30,955
Flammable gas	11,200						11,200
Flammable liquids	17,988	4,950	35,814				58,752
Flammable solids	158	179					337
Lead-acid batteries	0	154,675		5,366			160,041
Oil	128,081	262,415	107,626				498,121
Oil (contaminated)	22,330		2,982				25,312
Oil filters	3,328	2,260					5,588
Other	10,396	17,762	4,373	15,894		801	49,225
Oxidizer	3,030	150	303	1,113		27	4,623
Paint (latex)	39,325	11,742	820	62,687		28,038	142,612
Paints (other)	13,577						13,577
Paints oil based		2,416	155,699			12,225	170,340
Pesticides/preserv	18,549	1,139	4,392	1,540		758	26,377
Solvents	325	487	4,861				5,673
Toxic metals	20	2					22
SQG							
Corrosives					216		216
Paints oil based			156				156
Pesticides/preserv	14						14
Toxic metals		12					12
Adhesives			58				58
Flammable liquids	111		354				465
Oxidizer	150						150
1994 TOTALS	967,295	9,235,268	1,022,33	178,212	26,994	321,10	11,751,20
1994 Oil Collected =7,870,293		1993 Oil Collected =9,070,000			1993 MRW Collected =14,417,500		
h:\excel\mrw94sm.xls							