

BEST MANAGEMENT PRACTICES ANALYSIS FOR SOLID WASTE

VOLUME ONE

1987 Recycling and Waste Stream Survey

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## SECTION I

### INTRODUCTION AND OVERVIEW

In 1986, the Washington State Department of Ecology conducted a Statewide solid-waste recycling survey. This study estimated waste-stream composition for the residential and commercial sectors. At the conclusion of this project, the Department of Ecology decided to repeat this effort in 1987 and 1988. Waste-stream sampling was to occur throughout the year and across the entire State in order to compensate for seasonal variations as well as regional differences. The second-year effort was to incorporate additional commercial sampling as well as the sampling of self-hauled waste.

In the 1988 regular session of the Washington State Legislature, Substitute House Bill No. 1684 was enacted. This Bill directed the Department of Ecology to determine the Best Management Practices for categories of solid-waste in accordance with the priorities established in the State's Solid Waste Management Act:

- 1) waste reduction,
- 2) recycling,
- 3) energy recovery and incineration, and
- 4) landfilling.

The Bill further directed the Department to conduct a comprehensive waste-stream analysis and evaluation. This analysis was to be based upon representative solid-waste generation areas. Information to be developed included:

- 1) solid-waste generation rates for each category of the waste stream, and
- 2) the rate of recycling being achieved for each category of solid waste.

In order to provide the detailed waste generation and recycling baseline data required for the Statewide Best Management Practices Analysis, the Department of Ecology expanded its basic 1987 and 1988 waste composition and recycling survey. This study--which constitutes Volume I of the Best Management Practices Analysis--addresses:

- 1) Definition of Waste Generation Areas--Waste generation areas were defined as geographic areas within the State that had similar economic, environmental, and social characteristics and were dependent upon similar material transport networks. Other variables--such as waste composition, methods of waste collection and disposal, and the availability of recycling and commodity markets--were also considered in the determination of Waste Generation Areas (WGAs). The methodology used to define Waste Generation Areas is described in Section II of this report.

2. Quantity and Composition of Waste Disposed--The quantity of waste disposed and its composition was determined for each WGA. The composition and amounts contributed by residential, commercial/institutional, and manufacturing sources were identified. The volume and composition of self-hauled waste was also estimated. All waste which enters or could potentially enter the municipal waste stream was considered in this analysis. Results of this analysis are presented in Sections III and IV. Estimates for each WGA are summarized in Section VI.
3. Current Recycling Levels--The amounts of recyclable commodities actually recycled in each of the Waste Generation Areas were estimated for 1987. This information is presented in Section V. In Section VII, the quantities of waste disposed and materials recycled--as measured in the study--are compared with secondary data documenting the amount of recyclable materials potentially available for recycling or disposal, i.e., sold or distributed in Washington.

This extensive data collection effort was conducted by the Matrix Management Group in association with R.W. Beck and Associates and the Gilmore Research Group on behalf of the Department of Ecology.

The 1987 Recycling and Waste-Stream Survey is far more extensive than the 1986 study. The 1986 study was a statewide study covering only the residential waste stream and selected commercial categories. The 1987 study provides data for each of the eight waste generation areas as well as for the State as a whole. Secondly, and most importantly, the 1987 study covers all sources of potential municipal solid waste:

- o Publicly and privately hauled residential waste.
- o Publicly and privately hauled commercial and manufacturing waste.
- o Self-hauled waste (transported to dropbox, transfer station or final disposal site by an individual or firm not in the business of hauling or transporting solid waste).

As a result, the 1987 study analyzes all waste generated within the State of Washington. This amounted to over five million (5,000,000) tons, including both disposed waste and recycled materials. The waste stream analyzed in the 1986 study amounted to slightly more than three million (3,000,000) tons. The 1986 study did not include industrial, manufacturing or construction waste. Nor did it include self-hauled waste, which according to the 1987 study comprises almost 25% of the disposed waste stream.

Another major refinement in the 1987 study is that the quantity of waste disposed was based upon a statewide survey of every solid-waste hauler, transfer station and landfill owner or operator. The 1986 study relied on estimates for residential and commercial waste stream volumes. The number and types of recyclable commodities addressed in the 1987 study were also expanded. Additional recyclables surveyed in the 1987 study include:

- o Ferrous metals
- o Non-ferrous metals
- o White goods
- o Batteries
- o Tires

These new commodities significantly increased the total volume of recyclables since ferrous and nonferrous included all recovered metals including industrial and commercial scrap and car hulks.

Other improvements in the approach included:

- o More sampling from a larger number of commercial generator types.
- o A random survey of manufacturing generators.
- o On-site verification of waste-stream composition estimates for manufacturing generators (Sampling at the source rather than at a transfer or final disposal site).
- o Inclusion of self-haul loads being taken to dropboxes, transfer stations and landfills by both residential and commercial generators.
- o Year-round sampling throughout the State.

Because of these differences, the only comparable data are those for the residential waste stream. In the 1986 study the residential waste stream for the State was estimated to be 1,855,000 tons. Based on an actual survey of haulers, the residential waste stream is estimated to be approximately 1,821,000 tons in the 1987 study. The composition of the residential waste stream is quite similar with the following exceptions:

- o The percentage of newsprint fell 22%;
- o The percentage of corrugated containers declined approximately 26%;

- o Food waste increased approximately 30%; and
- o As expected, lawn and garden waste was reduced by about a third to 22%.

Based upon the 1986 study it was determined that Washington had achieved a 15% recycling rate statewide. The 1987 study concludes that the apparent recycling rate for the State, is approximately 22.5%, including ferrous metals. If the 1987 study had measured the same limited waste stream as the 1986 study, and included the same recyclable materials, the 1987 comparable recycling rate would have been about 21%.

## SECTION II

### DEFINITION OF WASTE GENERATION AREAS

#### 1. PURPOSE

On March 9, 1988, the Washington State Legislature passed Substitute House Bill 1684 (SHB 1684), which required the Washington State Department of Ecology (DOE) to conduct a thorough analysis and evaluation of best management practices for categories of solid waste within "representative solid-waste generation areas." These so-called "WGAs" were to be determined by DOE and were to become the geographic base for the evaluation of best management practices for solid waste. This section presents the results of the first step in the best-management-practices process, the definition of Waste Generation Areas.

#### 2. APPROACH

The Washington State Department of Ecology has defined Waste Generation Areas (WGAs) as "geographic areas which have similar economic, environmental, and social characteristics and are dependent upon similar transport networks." The characteristics chosen for defining WGAs relate to waste-stream analysis and vary across the State (for example, precipitation). The following activities were conducted in defining WGAs in Washington State:

- Identification of criteria to be considered.
- Focus group meetings with persons involved in solid-waste issues from different regions of the State, to gather their input on criteria to be considered.
- Compilation of input from regional focus groups regarding the most important criteria.
- Search for the best available data to reflect these highest-priority criteria.
- Mapping of Statewide variation of criteria factors for which data were available.
- Computer-assisted geographic analysis of Statewide variations in factors reflecting the most important criteria.
- Drafting of WGA boundaries based on the above geographic analysis.
- Presentation of proposed WGA boundaries to the Joint Select Committee on Preferred Solid Waste Management.

- Presentation of proposed WGA boundaries to regional focus group participants.
- Revision and presentation of draft WGA boundaries to DOE.

This Section discusses each of these steps, the results of the process, and the justifications for the proposed WGA boundaries.

### 3. DEVELOPMENT OF WASTE GENERATION AREA CRITERIA

#### a. Initial Identification of Criteria

There are a large number of criteria which could be considered in defining geographic areas based on similar economic, environmental, social, and transportation characteristics. Given the purpose of defining WGAs, the inquiry focused on three categories of factors, which related to:

- solid-waste generation,
- recycling, and
- disposal options.

Different subareas could be defined based on each of these categories; however, it was decided to consider them together. Although distinct, each involves a different portion of the same solid-waste stream, and all affect the eventual determination of best management practices for solid waste.

The following are the major criteria factors identified by the researchers, by category:

#### Generation Factors:

Population density  
 Per-capita income  
 Economic base/industry mix  
 Agricultural mix  
 Vegetation  
 Extent of recycling/reuse

#### Recycling Factors:

Population density  
 Public education  
 Availability of recycling opportunities  
 Recycled commodities markets

Disposal Factors:

Soil type  
Precipitation  
Environmental impacts  
Public acceptability  
Availability of sites  
Capacity considerations

Added to these three categories of criteria factors were other factors which relate to more than one category or to the solid-waste management process as a whole. Among these were political jurisdictions, transportation networks, and public opinion.

b. Regional Focus Group Input

During the first week of June, 1988, moderated discussion groups, called "focus groups," were held in four cities: Seattle, Yakima, Spokane, and Vancouver. DOE sent invitation letters to representatives of several public and private organizations who, in turn, identified possible participants among their members. The purpose of these focus groups was to have participants:

- identify criteria to consider when dividing Washington State into regions according to solid waste generation, recycling, and disposal;
- rank criteria in importance by category;
- suggest how these factors vary across the State;
- identify WGAs, if possible; and
- discuss ramifications of the WGA approach.

In order to facilitate participation, each group was designed to have no more than fifteen members. Participants included representatives from:

- local governments
- public solid-waste utilities
- solid-waste hauling and disposal businesses
- recycling companies

- health departments
- environmental groups
- civic groups
- area industries

In every group, participants discussed the purpose of defining WGAs. The substate approach to solid-waste management was generally preferred to the Statewide approach. However, participants expressed concern about the possible disruption of their ongoing county solid-waste plan processes.

After describing the purpose of defining WGAs, the focus group discussion turned toward gathering input on criteria to be considered in drawing WGA boundaries. Examples were given for each of the categories of criteria factors (generation, recycling, disposal, and other), then participants offered their suggestions. The following lists illustrate the variety of factors identified, by category.

Suggested Generation Factors (partial list):

Existence of mandatory garbage collection.

Amount of industrial versus commercial/residential generation.

Industry mix.

Climatic factors.

Agricultural mix.

Per-capita income.

Urban versus rural population.

Age of population.

Projected economic growth.

Suggested Recycling Factors (partial list):

Disposal cost as incentive to recycle.

Government incentives for purchasing recycled products.

Convenience for individual recyclers and recycling businesses.

Cost of transporting recyclables to market.

Public education.

Government regulations (e.g., zoning).

Availability of recycling programs.

Suggested Disposal Factors (partial list):

Cost of disposal.

Environmental site factors.

Land-use regulations.

Capacity of existing systems.

Public acceptability.

Hydrology/geology.

Precipitation.

Suggested "Other" Factors (partial list):

Geographic barriers.

Economic impact of solid-waste management choices.

Public opinion.

Political jurisdictions.

Setup costs for operations.

Proximity to State borders.

Governmental "red tape".

c. Highest-Priority Factors

Focus group participants were then given twelve adhesive colored dots and asked to put three next to the factor or factors within each category that they considered the most important. They were allowed to put three of their "priority dots" on one factor if they wished.

The final tally from all focus group participants showed which factors were selected as most important to consider when dividing Washington State into WGAs:

Most Important Waste Generation Factors:

Per-capita income.

Industry mix.

Amount of industrial versus commercial/residential generation.

Most Important Recycling Factors:

Public education.

Convenience for individual recyclers and recycling businesses.

Cost of transporting recyclables to market.

Most Important Disposal Factors:

Cost of disposal.

Public acceptability.

Environmental site factors.

Most Important "Other" Factors

Political jurisdictions.

Governmental "red tape".

Public opinion.

4. DETERMINATION OF WASTE GENERATION AREA BOUNDARIES

a. Data Searches

Input from people across the State who are involved in solid-waste issues resulted in the list of factors considered most important in defining Waste Generation Area boundaries.

Conducting a geographic analysis of these factors, with the goal of defining WGAs, required that quantifiable data be available. Given this requirement, some important factors--like "public acceptability"--could not be added to the analysis within the time allotted. The search for data

concentrated on the important factors for which numeric data could be obtained quickly.

Political jurisdictions, especially counties, were noted by focus group participants as crucial considerations in any solid-waste management planning. Ignoring political boundaries, it was suggested, could encourage interjurisdictional conflict and could undermine work already accomplished under existing county solid-waste management plans. Initial data searches also revealed that the latest information on population, income, and employment was available by county, not by smaller divisions. Therefore, it was decided to use the thirty-nine counties within the State of Washington as the units of analysis.

Below is the list of factors chosen to be included in the geographical analysis:

- Per-capita income
- Population
- Total employment in lumber and wood-products industries
- Total employment in nonlumber manufacturing
- Percent of area in harvested cropland
- Number of recycling centers
- Transportation costs to market for scrap paper
- Average annual precipitation

The following narrative describes each of the specific data variables used in the analysis and the rationale for their selection. The maps inserted at the conclusion of this section display the Statewide variations in these eight factors.

Per-capita income (U.S. Department of Commerce, 1988)-- Found to correlate with residential waste volume and, particularly, waste composition. The map shows higher per-capita income in the Puget Sound area and in counties of Eastern Washington with low population and a higher percentage of large agricultural enterprises. Total personal income has also been mapped.

Population (Washington Office of Financial Management, 1987)-- The most direct indicator of residential/commercial waste volume. The population density map shows that, although their populations are smaller, Kitsap and Clark Counties have population densities similar to those of King and Pierce Counties. The dot map of communities with 5,000+ population displays how population centers are distributed within the State.

Total employment in lumber and wood-products industries (U.S. Census Bureau, 1987)--Indirectly indicates the volume of waste contributed by wood and paper manufacturing processes, a key State industry. Its use also provides some measure of the industry mix in a county. Percent total employment in lumber and wood products is mapped.

Total employment in nonlumber manufacturing (U.S. Census Bureau, 1987)--Indirectly indicates the volume of waste contributed by nonlumber

industrial sources. A map of percent total employment in nonlumber manufacturing is attached.

Percent of area in harvested cropland (U.S. Census Bureau, 1982)--Gives an indication of the contribution of agricultural pursuits. More recent information from Washington Agricultural Statistics (1986-87) did not provide consistent breakdowns by county.

Number of recycling centers (Washington Department of Ecology, 1988)--Provides some measure of the convenience of recycling opportunities for individual households and businesses.

Transportation costs to market for scrap paper (Washington Utilities and Transportation Commission, 1987)--Hauling by truck is by far the most common method of transporting recyclable materials in the State. The Washington Utilities and Transportation Commission (UTC) establishes rates for truckloads originating in Washington State. Transport costs were calculated by applying UTC rates for a 42,000-pound load for distances on routes used by Washington recyclers to send scrap paper either out-of-State or to an in-State reprocessing plant. Scrap paper was chosen among the materials recycled in Washington because it is one of the most commonly handled recycled commodities. Information gathered from recyclers in the 1986 Washington State Recycling Survey (Washington Department of Ecology, 1987) was used to establish the actual paper recycling transport network (refer to map). County figures for scrap paper transport costs were calculated by averaging (1) costs along transport routes known to originate in a county, and (2) any lower-cost transport routes to an available market, even if there was no evidence of its use in 1986. If no information was available from paper recycling businesses in a county, values were estimated based on transport costs from the major county population center to the nearest available market.

Average annual precipitation (National Oceanic and Atmospheric Administration, 1982)--Used data for the greatest available number of reporting stations, based on thirty years of recording (1951-1980), for all but two counties: Wahkiakum and Skamania. For these counties, comparable thirty-year data were not published, so the longest-term available annual averages were used (WSU Agricultural Extension Service, 1964; WSU Cooperative Agricultural Extension Service, 1972). In the Appendix can be found a map of isolines showing the changes across counties for mean annual precipitation. Of particular interest is the 12-inch isoline, because landfill sites where annual precipitation is less than twelve inches have less-stringent liner requirements from DOE. In Okanogan and Yakima Counties, the average annual precipitation value appears low when compared to this isoline map. This is because the reporting stations in these counties are located in the drier sections.

Although not able to be used in the computer analysis, the following factors were mapped (these maps also appear at the conclusion of this section):

General soil conditions for landfills (U.S. Geological Survey, 1968)--Not included as a variable in the computer analysis because of the difficulty of quantification. However, this factor has a bearing on the availability of sites for landfills and is therefore important to consider. A local expert on landfill siting notes that engineering techniques are now used to overcome most soil permeability problems. In this way, slope gradient becomes a more important criterion, since areas with a slope greater than 15% are considered too steep for a landfill site. The location of a potential landfill with respect to surface and groundwater is also a crucial siting factor. However, the small size of this map did not allow for the mapping of the numerous aquifers across the State. (NOTE: Although soil permeability in some parts of Southwestern Washington might seem to indicate a good site for landfills, the higher precipitation there reduces this advantage.)

State highway system--The accompanying map of the Washington State highway system indicates the interconnectedness of the different areas of the State. Of particular importance is the fact that only a few roads cross the Cascade Mountains, which extend from north to south across the State. The State transportation network affects the possibilities for flows of recycled materials, as well as the shipment of solid waste for incineration or disposal. Any solid-waste management plans which include interregional materials transfer must take into account the availability of year-round transportation routes.

Areas of dominant influence (ADIs) (Arbitron, 1985)--ADIs are established geographic areas dominated by a specified metropolitan agglomeration of television broadcasting stations. ADI statistics are commonly used in determining advertising rates charged by broadcasters. For the purposes of this study, ADIs could be considered areas dominated by a certain population concentration--market areas focused on and connected functionally to an urban center.

#### b. Method of Analysis

As noted previously, eight quantifiable variables were selected to be included in a computer-assisted geographic analysis. Values for each of these variables were matched to the corresponding county on a computer database.

The statistical method employed for grouping similar counties was cluster analysis, using Ward's algorithm as the method of assignment. This method assigns counties to one or another cluster with the goal of minimizing the squared Euclidean distance among the variable values of members of the same group, while maximizing the difference between different groups.

The computer was asked to show how counties would be grouped if there were two clusters, three clusters, four, and so on, up to ten clusters. The results were examined for the number of clusterings which made the most intuitive sense. Two clusters resulted in King County being

by itself, with the remaining cluster being all other counties. Eight clusters, on the other hand, revealed too much diversity. Six clusters appeared to be a good compromise (see map).

c. Proposed WGA Boundaries and Review Process

The first step in drawing Waste Generation Area boundaries was to divide the State along the Cascade Mountain crest. Not only was this suggested by the focus group participants, but it also seemed plausible given differences in population density, transportation, and precipitation which parallel this division.

Next, centroids for WGAs were identified by looking for counties whose cluster designations differed from their surrounding counties. In all, five centroids were chosen:

- King-Pierce Counties;
- Spokane County;
- Clark County;
- Whatcom County; and
- Yakima-Benton Counties.

Adjacent counties were accreted to each of these centroids until advancing boundaries began to meet. Preliminary lines were drawn and some larger areas were subdivided. The result was seven draft WGAs.

The preliminary WGA boundaries were presented on June 23, 1988 to the Legislative Joint Select Committee on Preferred Solid Waste Management. Some lines were deliberately allowed to divide counties, to encourage discussion with the Joint Select Committee that might help clarify which way the divided counties should go. This, indeed, is what occurred, and the Joint Select Committee ended by endorsing a breakdown into seven WGAs.

The next step in the WGA-boundaries-defining process was to return to the Statewide focus group participants and solicit their input on the proposed breakdowns. The first group, in Yakima, said that the southeastern corner of Washington State was distinct enough to constitute a separate WGA, with the Tri-Cities, Walla Walla, and Pullman as its major urban centers. They also said that they would have no problem accepting a large central area, including Yakima and Wenatchee, that stretched from Klickitat County on the southern State border to Okanogan County on the northern border. It was felt that this WGA, though large, encompassed areas with similar population densities, precipitation ranges, and market areas.

When these "Yakima revisions" were presented during the last part of the second focus group in Spokane, the participants agreed with the

designation of a southeastern WGA. The large central WGA suggested by the Yakima discussants also caused them no problems. The remaining focus groups, in Vancouver and Seattle, echoed this approval of the revised seven WGAs.

The Joint Select Committee on Preferred Solid Waste Management concurred with the "Yakima revisions." The Department of Ecology, however, was concerned with the large size of the proposed Central WGA. It was also felt that Swauk Pass, the transportation linkage between Wenatchee and Ellensburg, was interrupted enough in the winter to consider these two cities as functionally separate. Therefore, this region was divided at the Chelan-Kittitas County line into a North Central and a South Central WGA, with Wenatchee and Yakima as their major urban centers, respectively.

d. Revised WGA Boundaries

The following map, Figure II-1, displays the eight Waste Generation Areas, as revised by the Joint Select Committee, the four regional focus groups, and the DOE. The WGAs and the counties they include are:

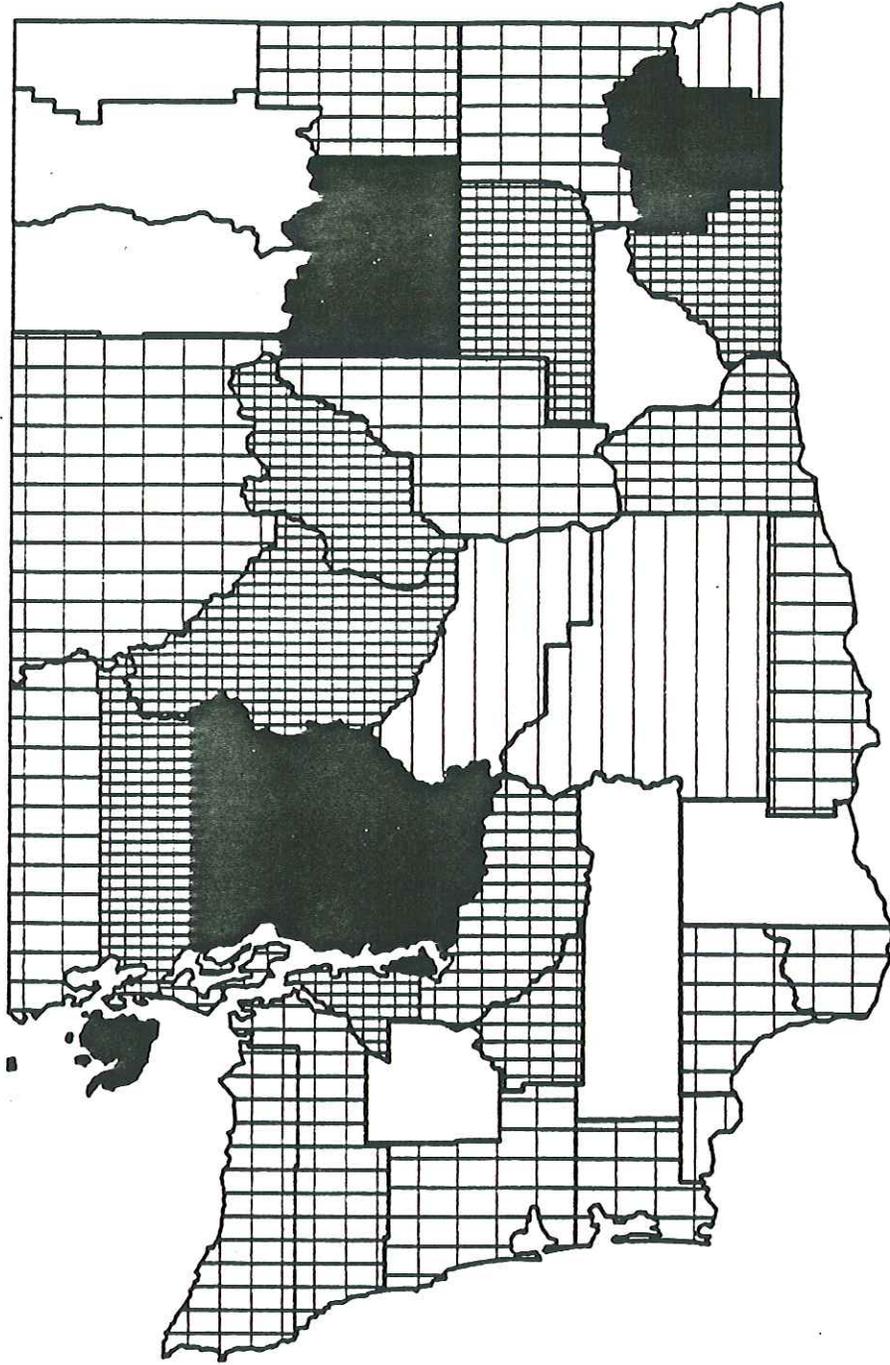
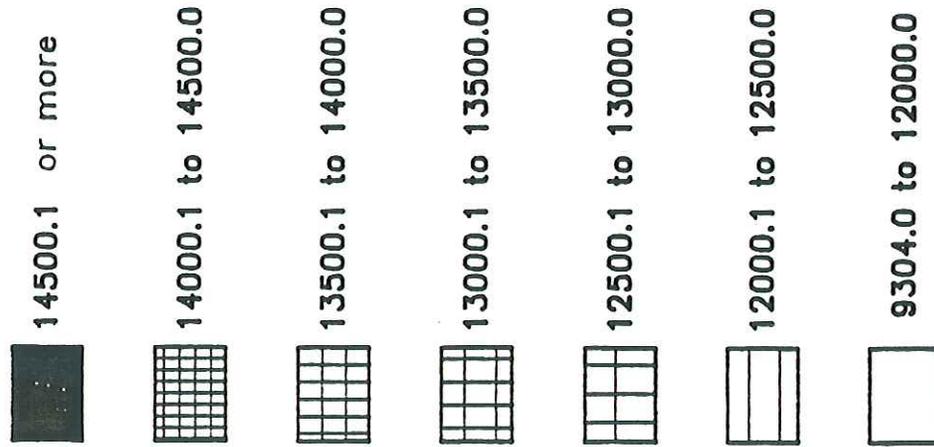
<u>WGA Name</u>	<u>Counties</u>
West	Clallam, Grays Harbor, Jefferson, Mason, Pacific
Northwest	Island, San Juan, Skagit, Whatcom
Puget Sound	King, Kitsap, Pierce, Snohomish, Thurston
Southwest	Clark, Cowlitz, Lewis, Skamania, Wahkiakum
North Central	Chelan, Douglas, Grant, Okanogan
South Central	Kittitas, Klickitat, Yakima
Northeast	Ferry, Lincoln, Pend Oreille, Spokane, Stevens
Southeast	Adams, Asotin, Benton, Columbia, Franklin, Garfield, Walla Walla, Whitman



# PER CAPITA INCOME

-1986 Data By County -

Dollars

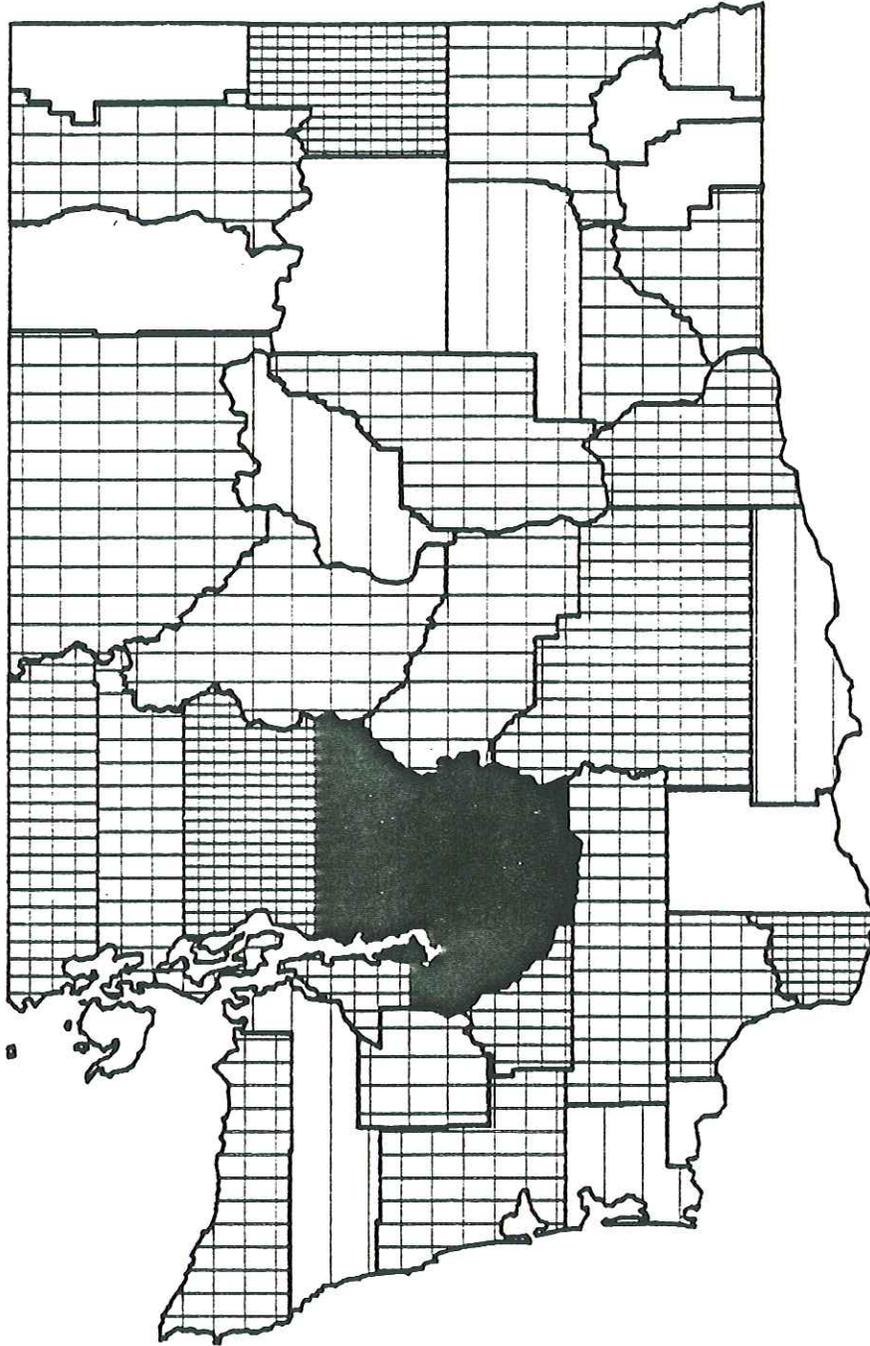
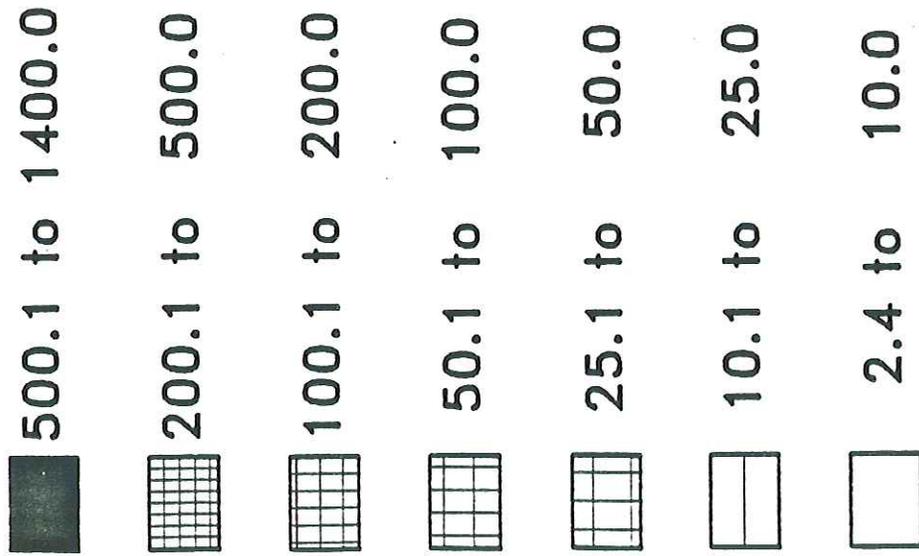


*Source: Bureau of Economic Analysis  
(U.S. Dept. of Commerce)*

# COUNTY POPULATION

— 1987 Data By County —

No. in 000's



Source: WA Office of Financial Management

# TOTAL EMPLOYMENT IN LUMBER MANUFACTURING

-1985 Data By County -

Number of Employees

2501 or more

1001 to 2500

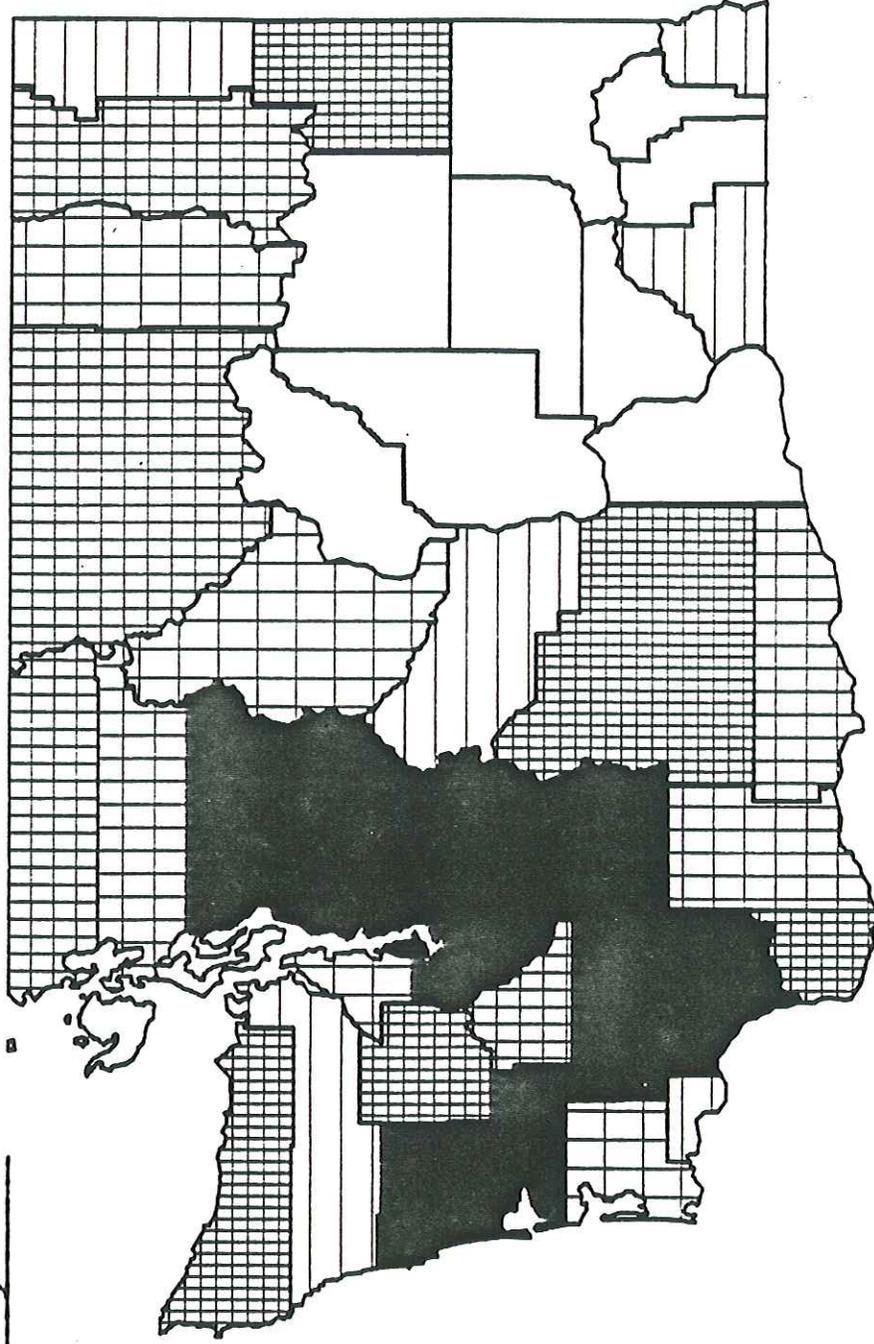
751 to 1000

501 to 750

251 to 500

250 or less

0

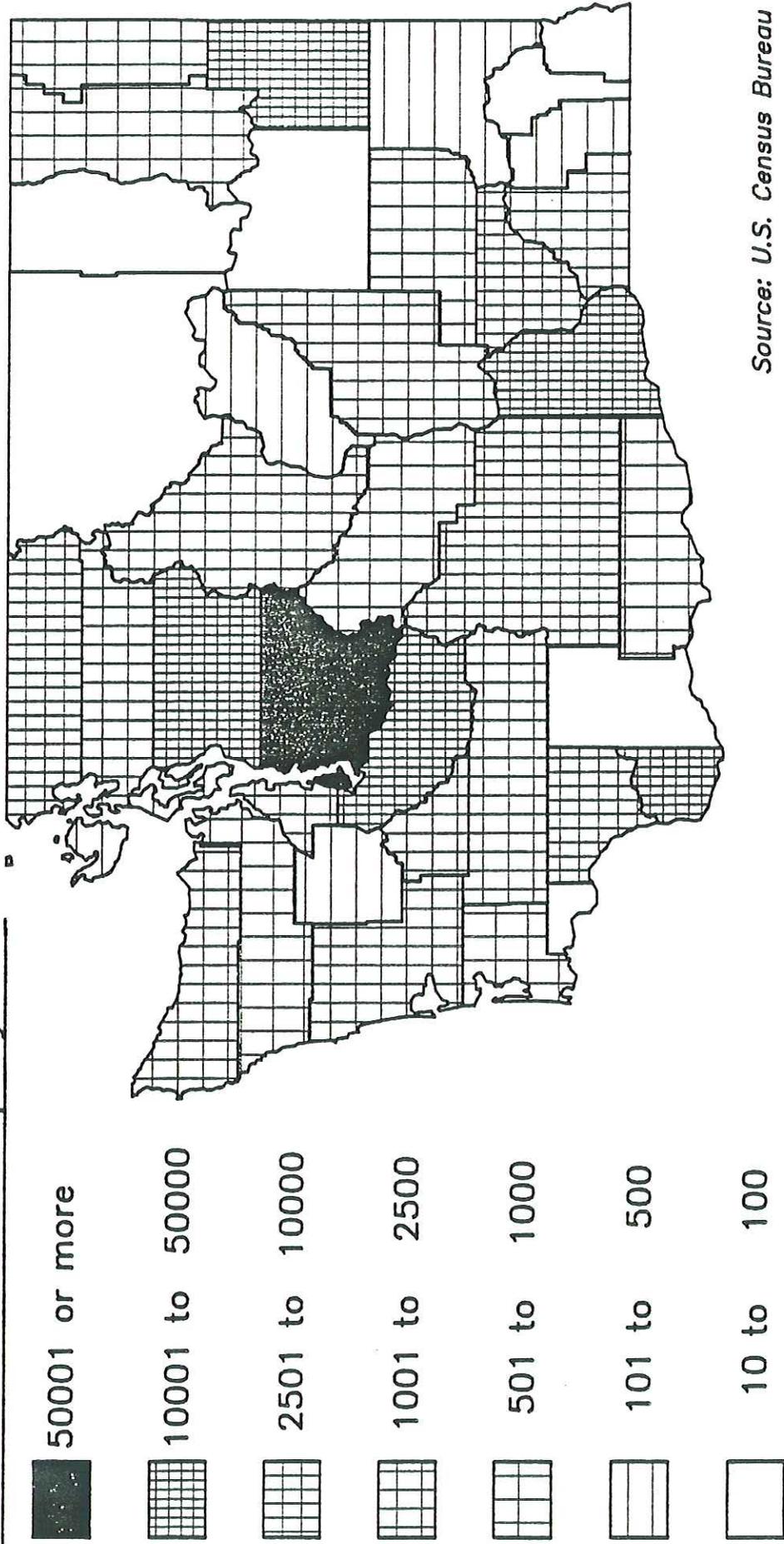


Source: U.S. Census Bureau

# TOTAL EMPLOYMENT IN NON-LUMBER MANUFACTURING

-1985 Data By County -

## Number of Employees

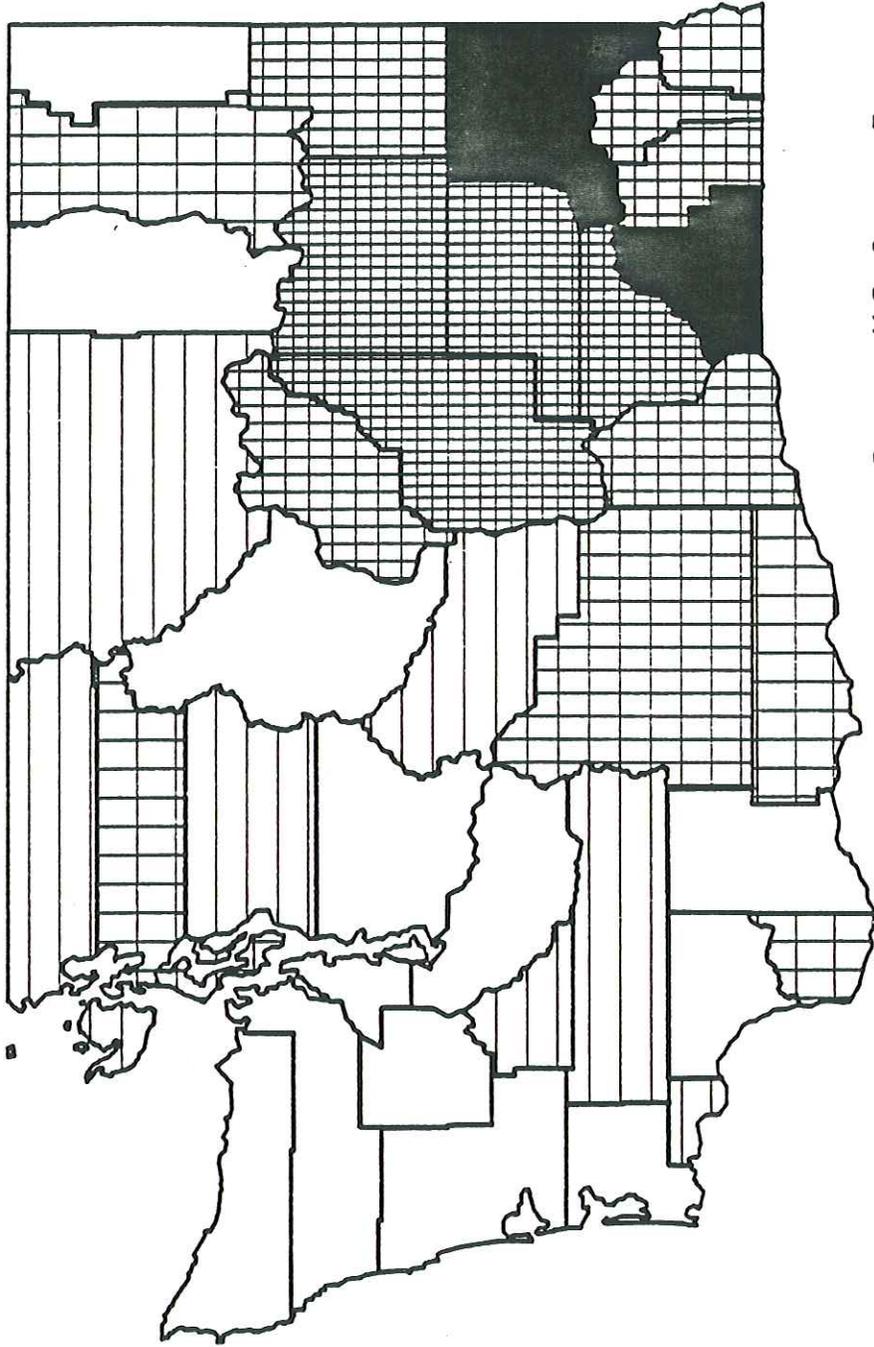
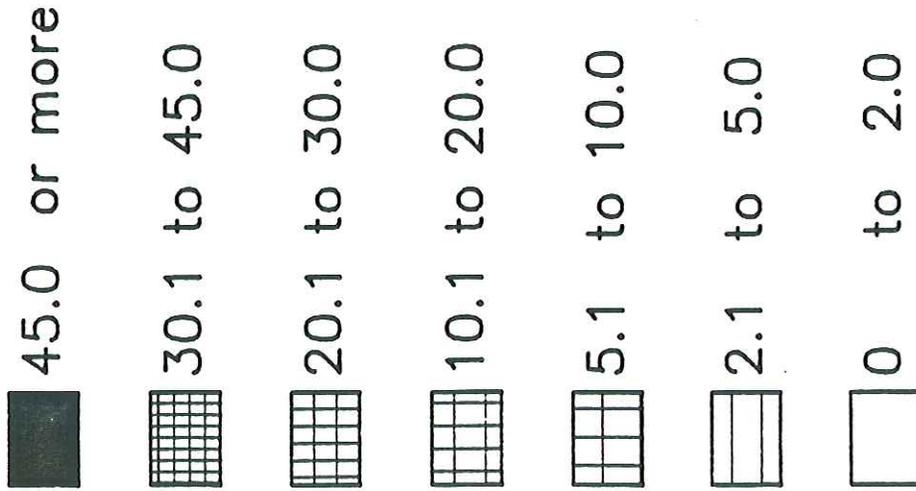


Source: U.S. Census Bureau

# PERCENT OF AREA IN HARVESTED CROPLAND

- 1982 Data By County -

% of AREA



Source: U.S. Census Bureau

# NUMBER OF RECYCLING CENTERS

- 1987 Data By County -

## NUMBER

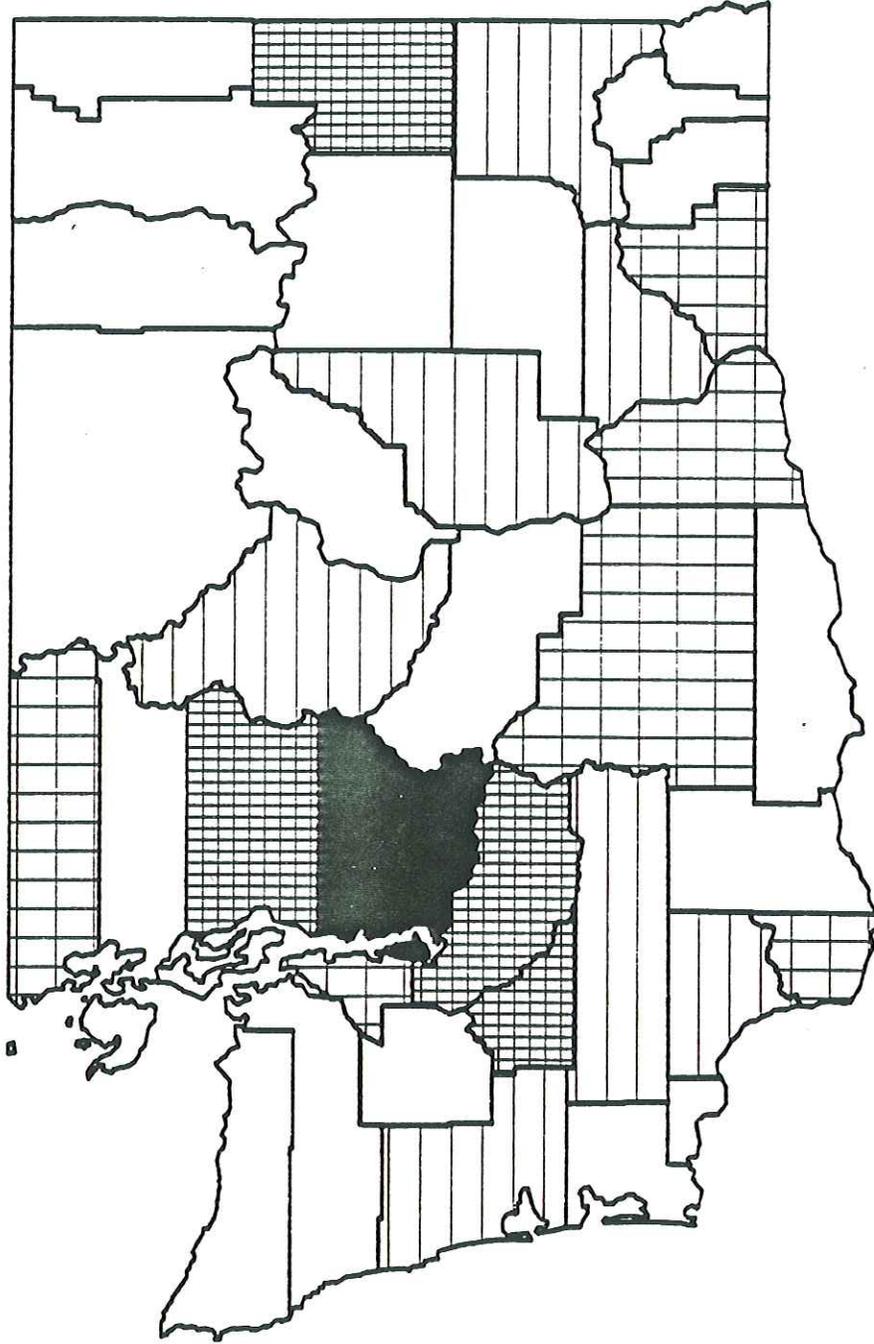
36 or more

16 to 35

9 to 15

5 to 8

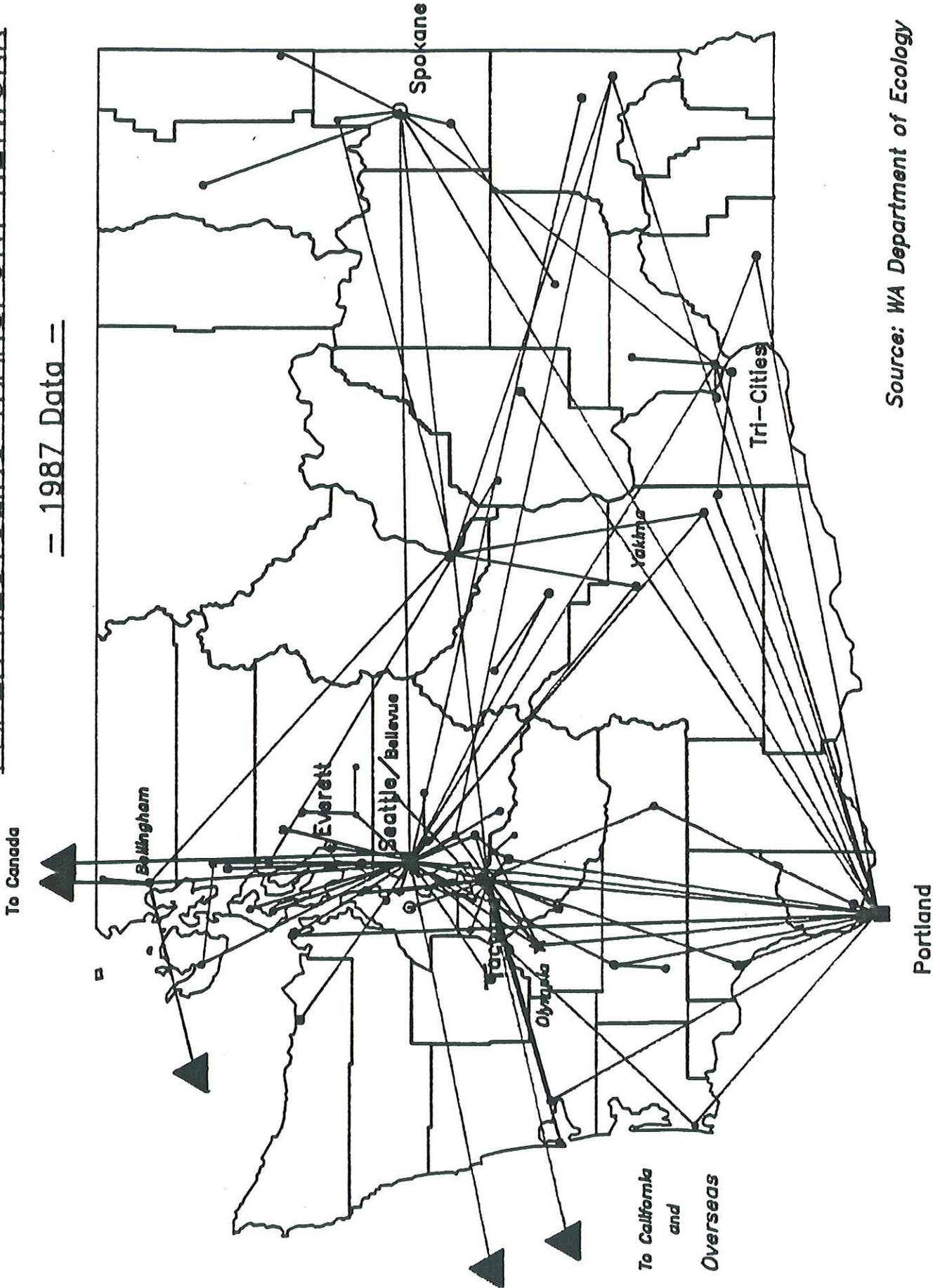
0 to 4



Source: WA. DOE

# PAPER RECYCLING TRANSPORT NETWORK

— 1987 Data —



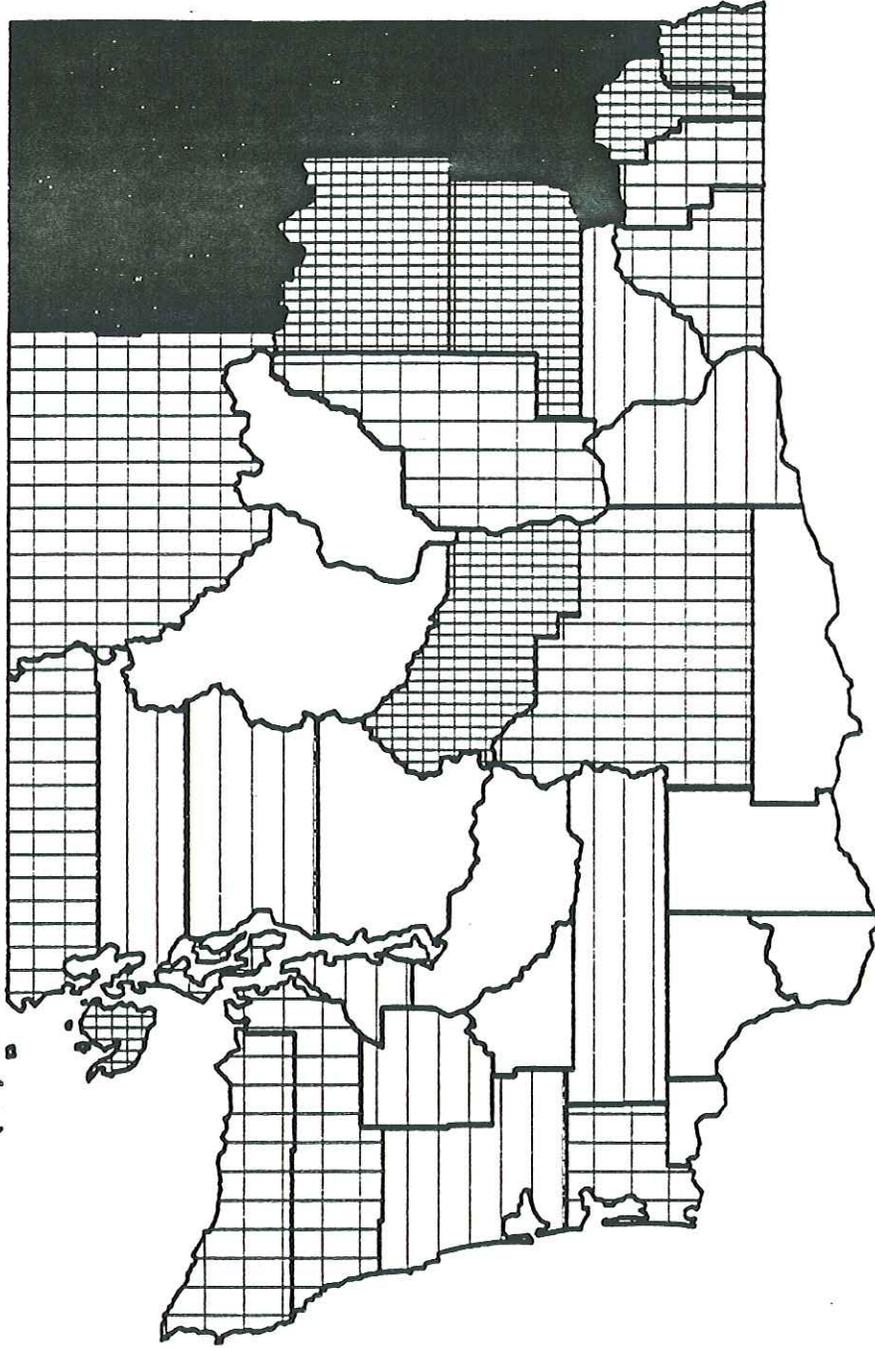
Source: WA Department of Ecology

# SCRAP PAPER TRANSPORT COSTS TO MARKET

— 1988 Average By County —

Cost for 42,000 lb. load (\$)

- 401 to 575
- 326 to 400
- 301 to 325
- 251 to 300
- 201 to 250
- 200 or less

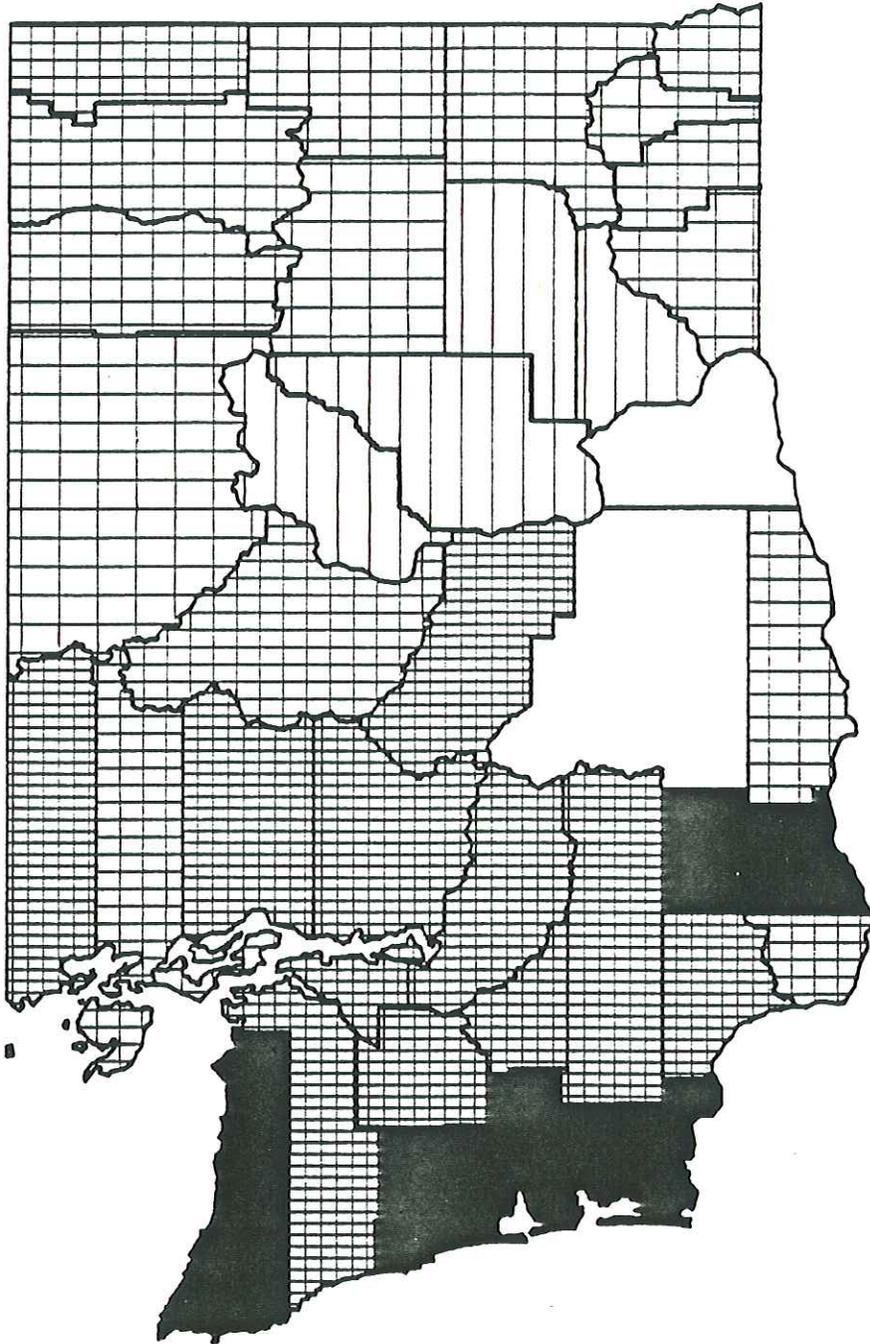
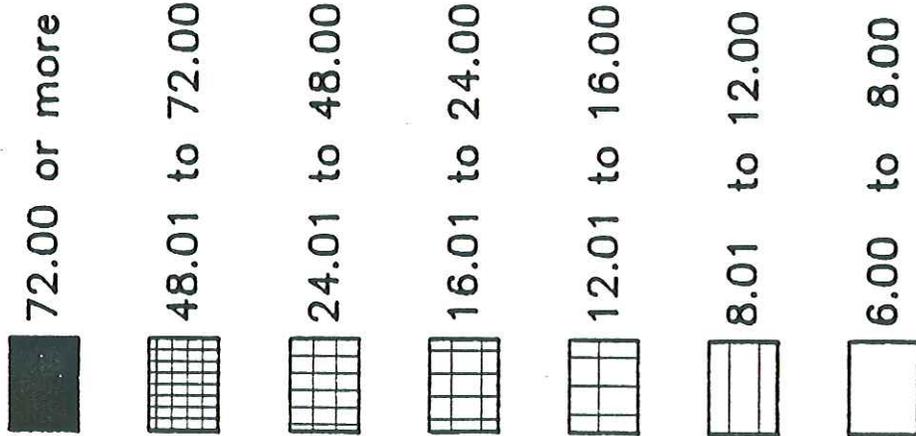


Source: WA Utilities and Transportation Commission

# AVERAGE ANNUAL PRECIPITATION

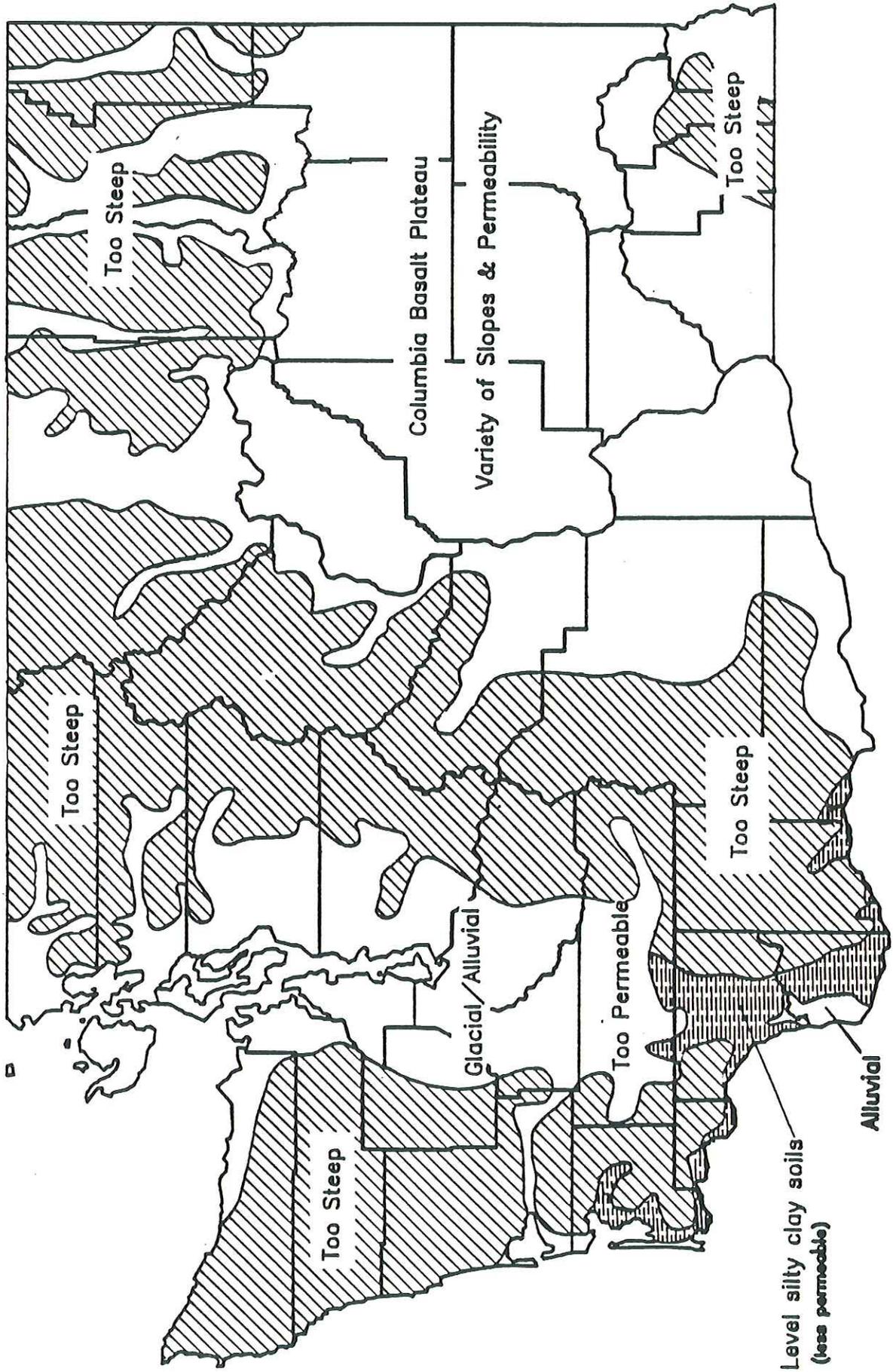
— 1951—1980 Average By County —

## Inches



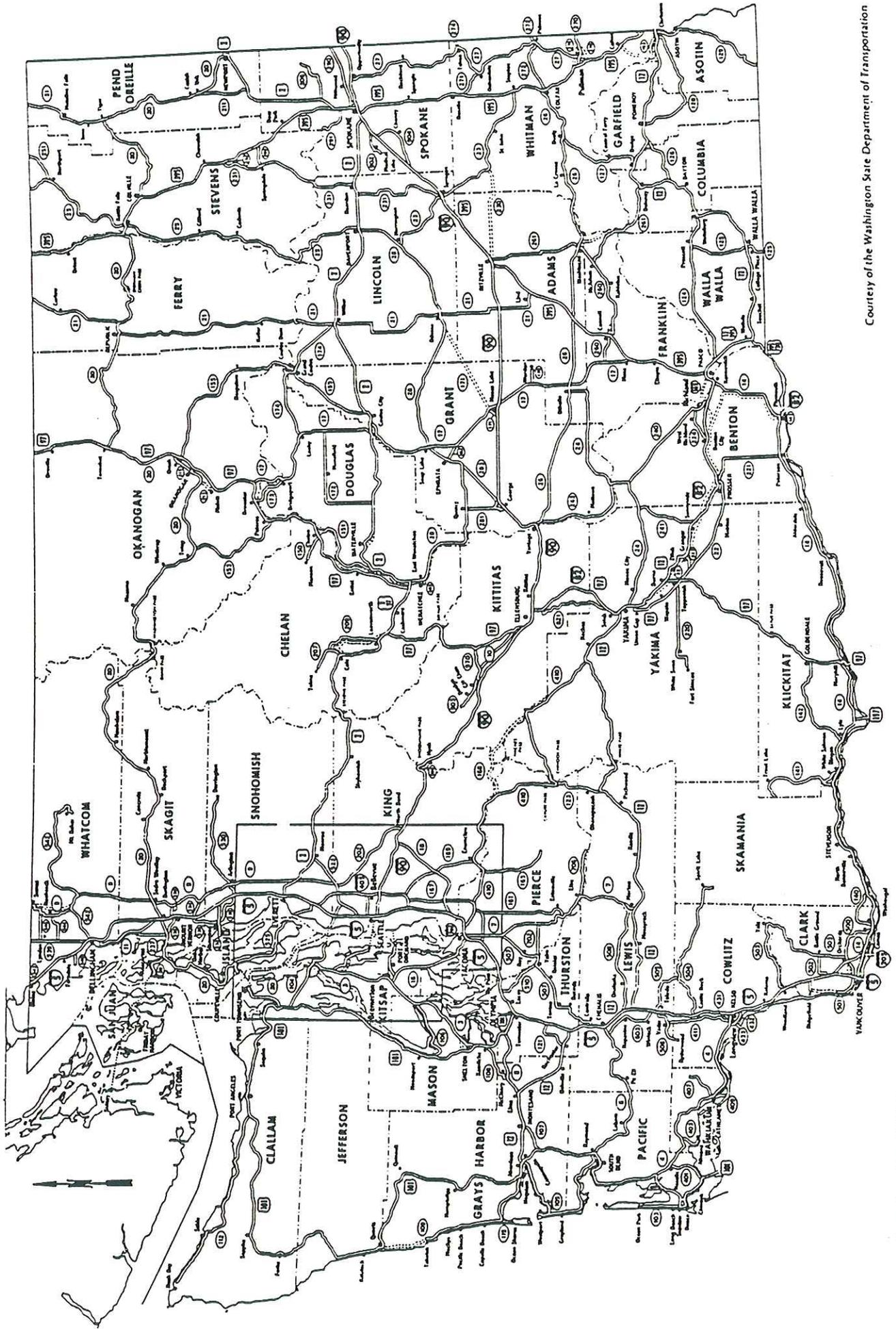
*Source: National Oceanic & Atmospheric Administration*

# GENERAL SOIL CONDITIONS FOR LANDEILLS



Source: U.S. Geological Survey

# STATE HIGHWAY SYSTEM

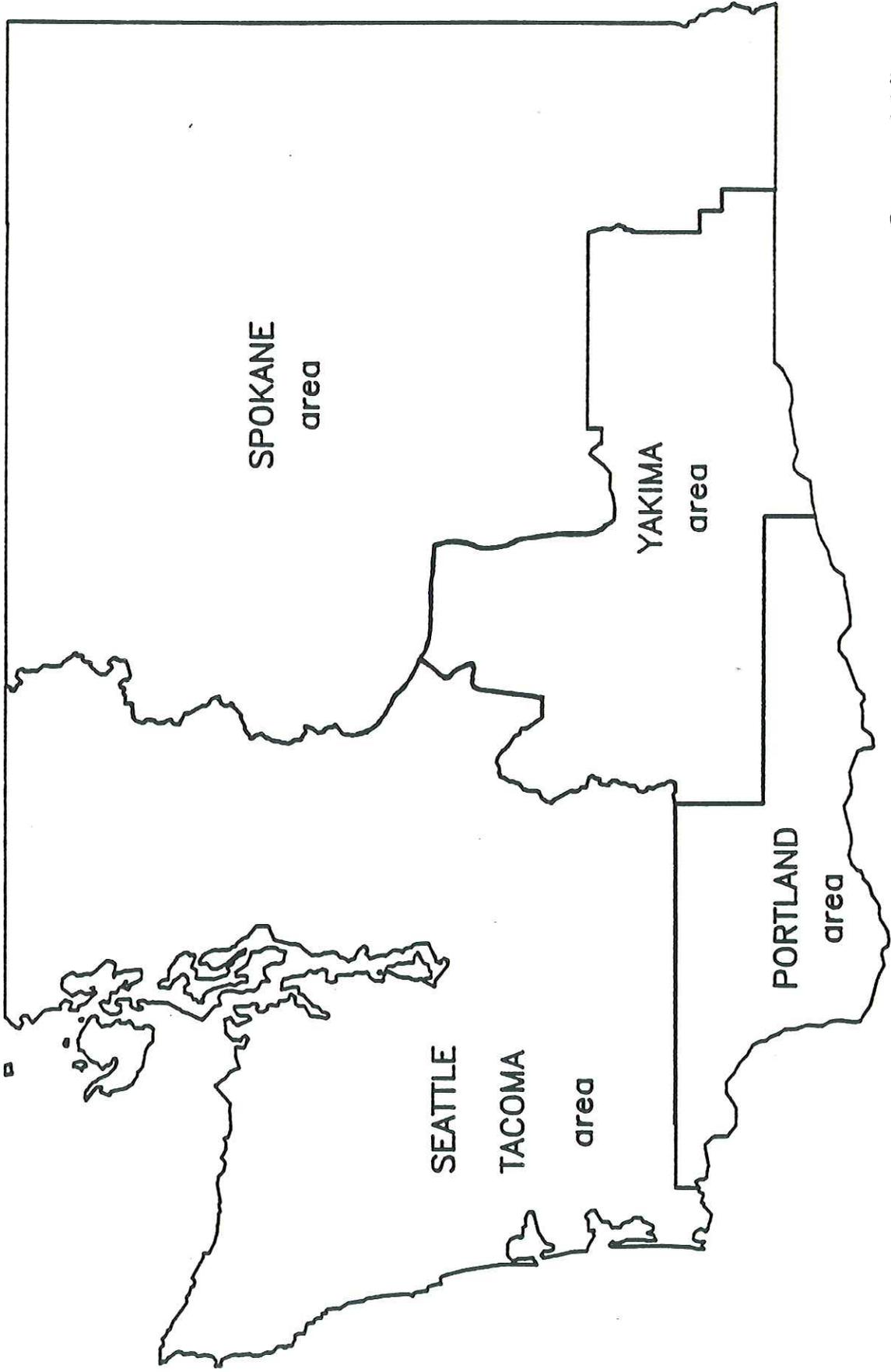


Courtesy of the Washington State Department of Transportation

Scale: 1 inch = 50 miles  
Copyright © 1988 by the State of Washington  
Revised 1988

# AREAS OF DOMINANT INFLUENCE ( ADIS )

— Television Broadcasting Areas —



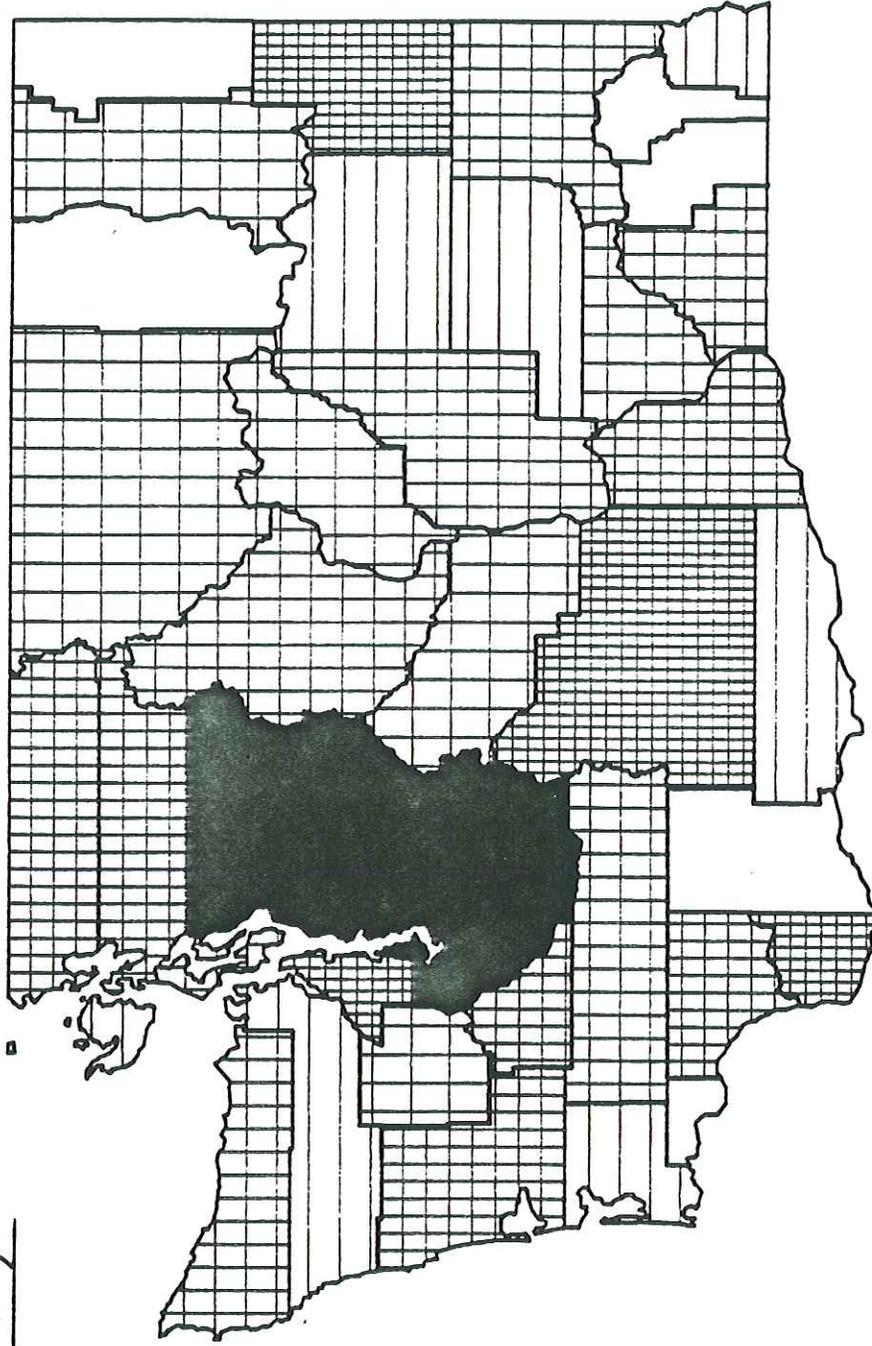
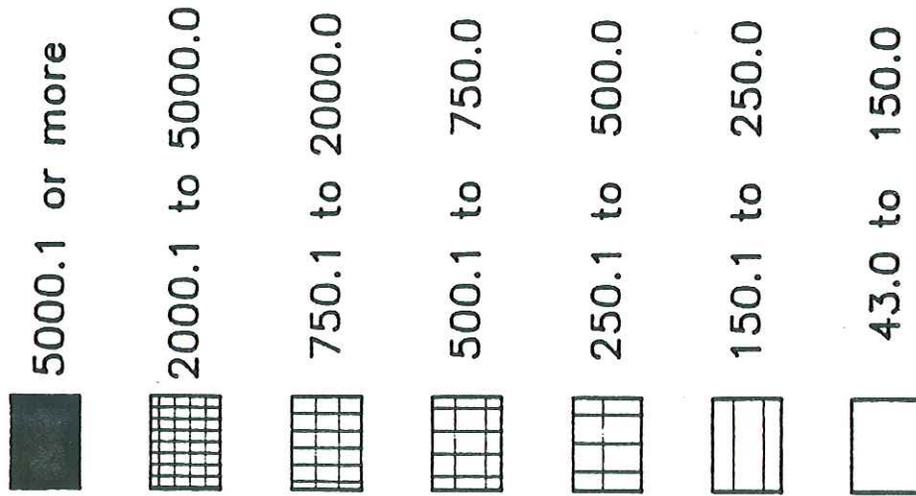
Source: Arbitron

Maps of Additional Factors

# TOTAL PERSONAL INCOME

-1986 Data By County -

Dollars (millions)



Source: Bureau of Economic Analysis  
(U.S. Dept. of Commerce)

# POPULATION DENSITY

- 1987 Data By County -

Persons / Sq. mile

■ 251 or more

▒ 101 to 250

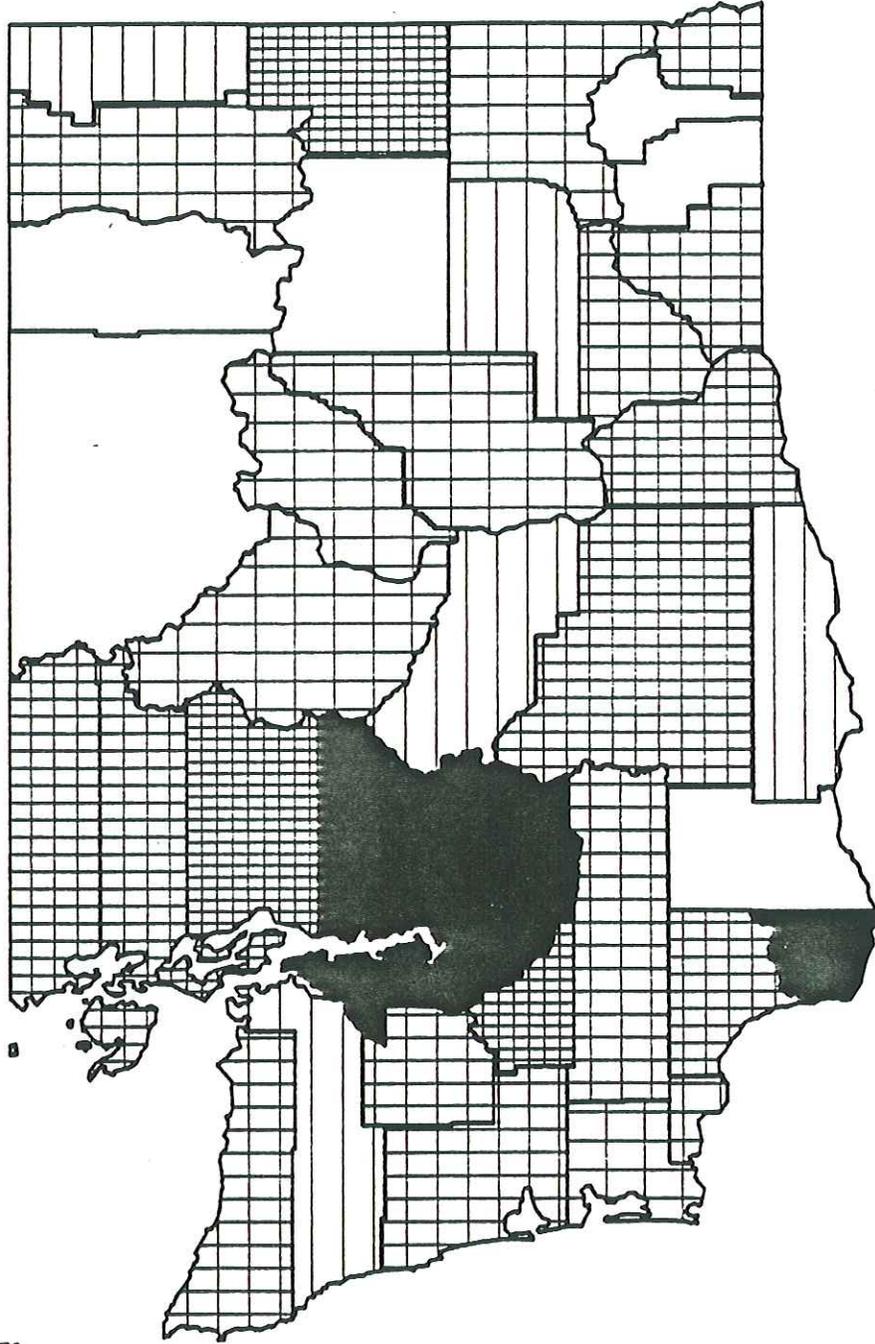
▒ 41 to 100

▒ 21 to 40

▒ 13 to 20

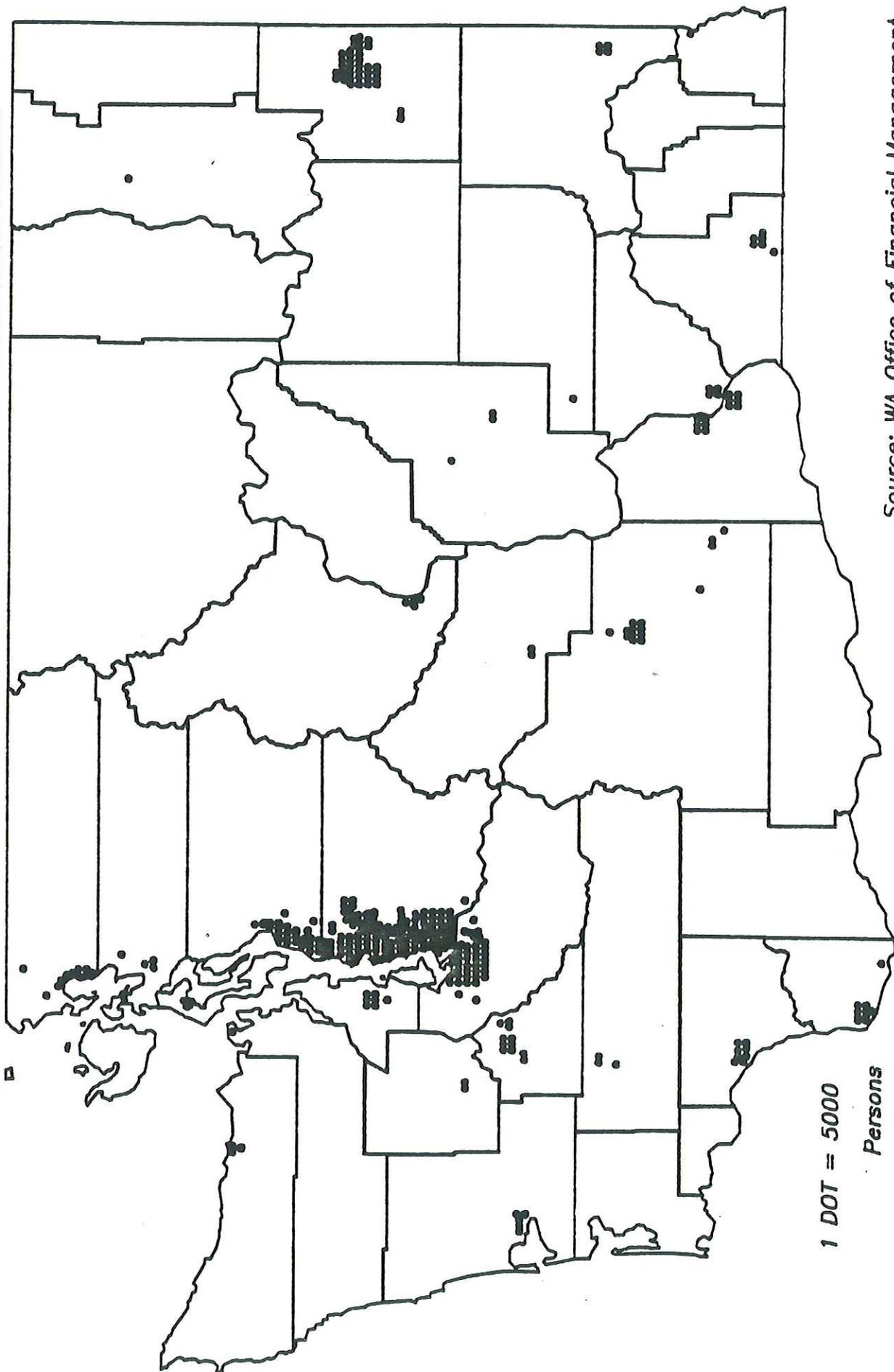
▒ 7 to 12

□ 3 to 6



Source: WA Office of Financial Management

COMMUNITIES WITH 5000+ POPULATION



1 DOT = 5000  
Persons

Source: WA Office of Financial Management

# %TOTAL EMPLOYMENT IN LUMBER MANUFACTURING

— 1985 Data By County —

Percent

35.1 or more

20.1 to 35.0

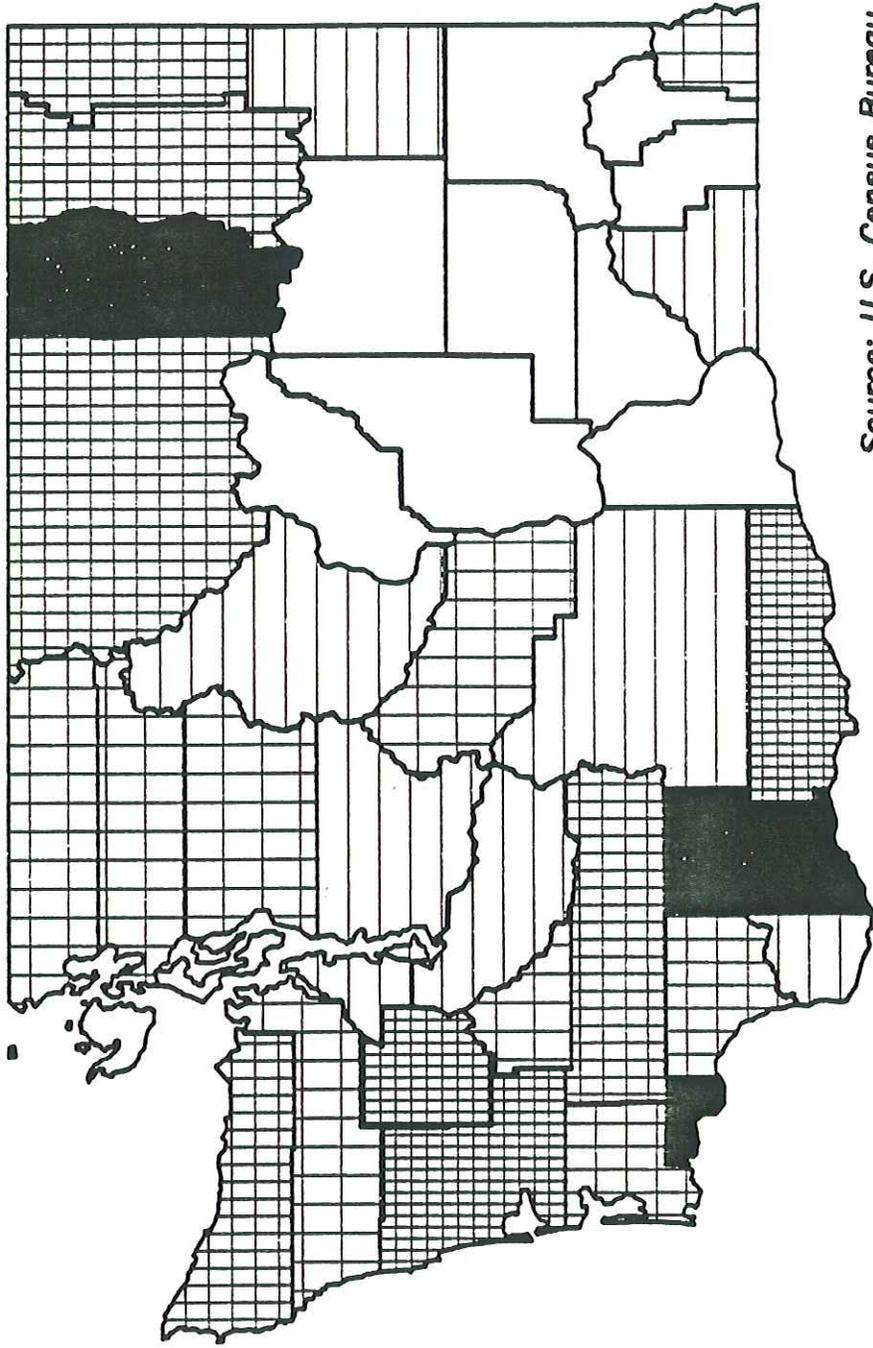
15.1 to 20.0

5.1 to 15.0

3.1 to 5.0

3.0 or less

0

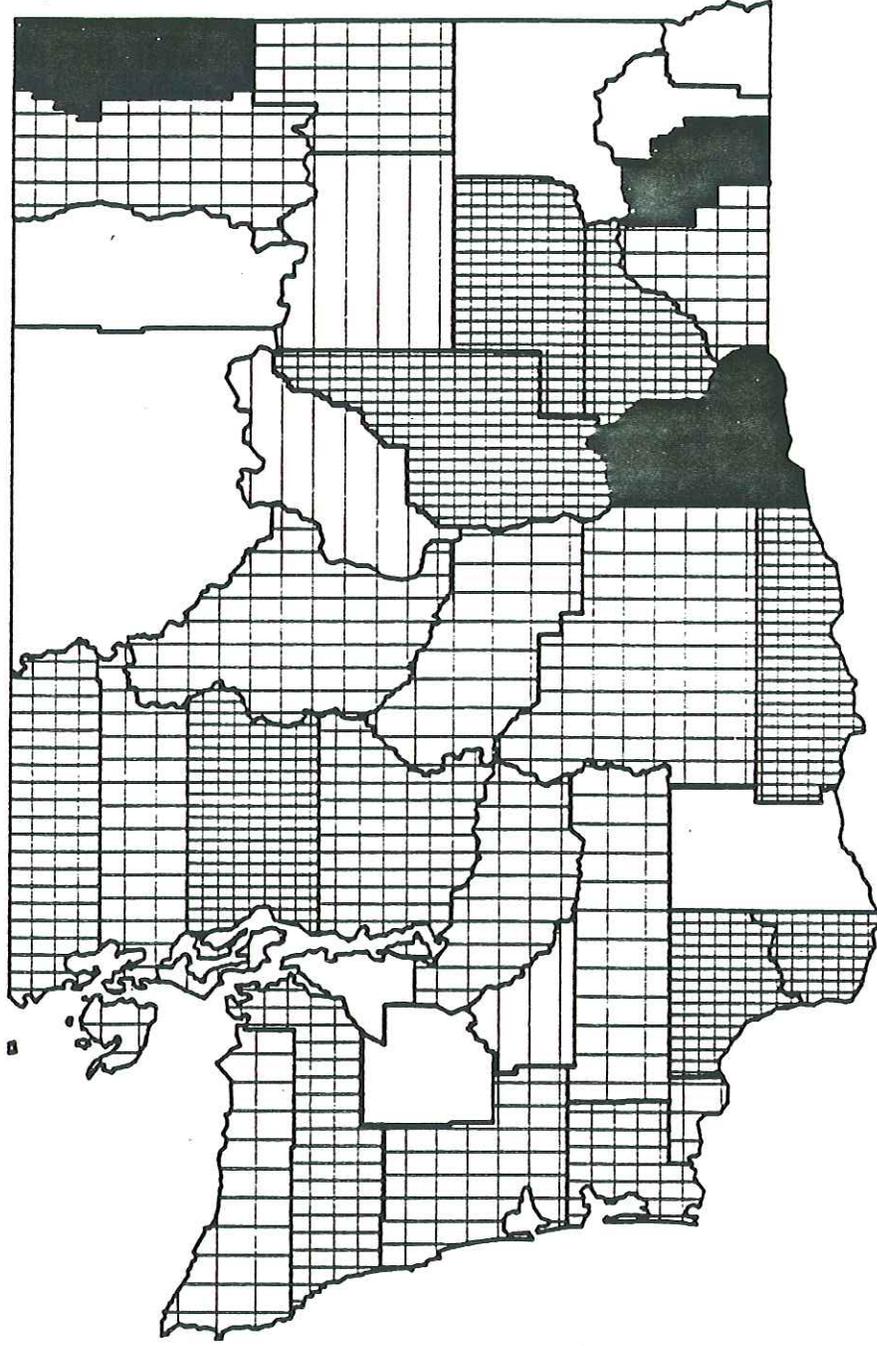
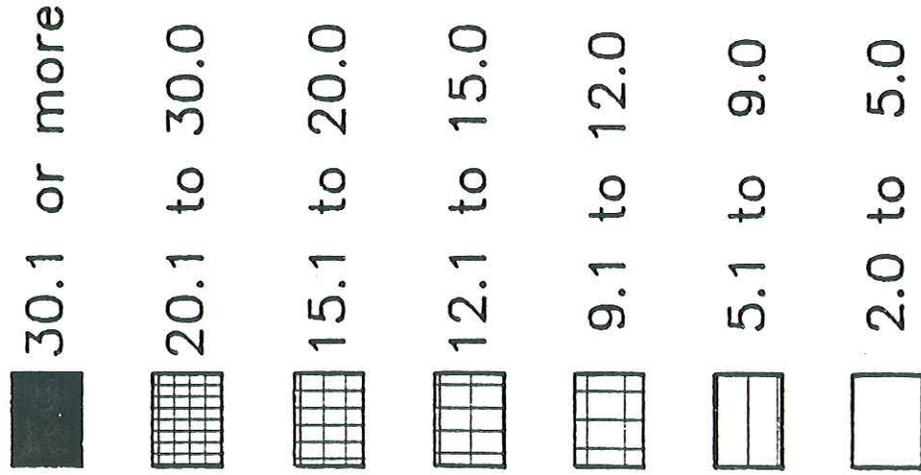


Source: U.S. Census Bureau

# % TOTAL EMPLOYMENT IN NON-LUMBER MANUFACTURING

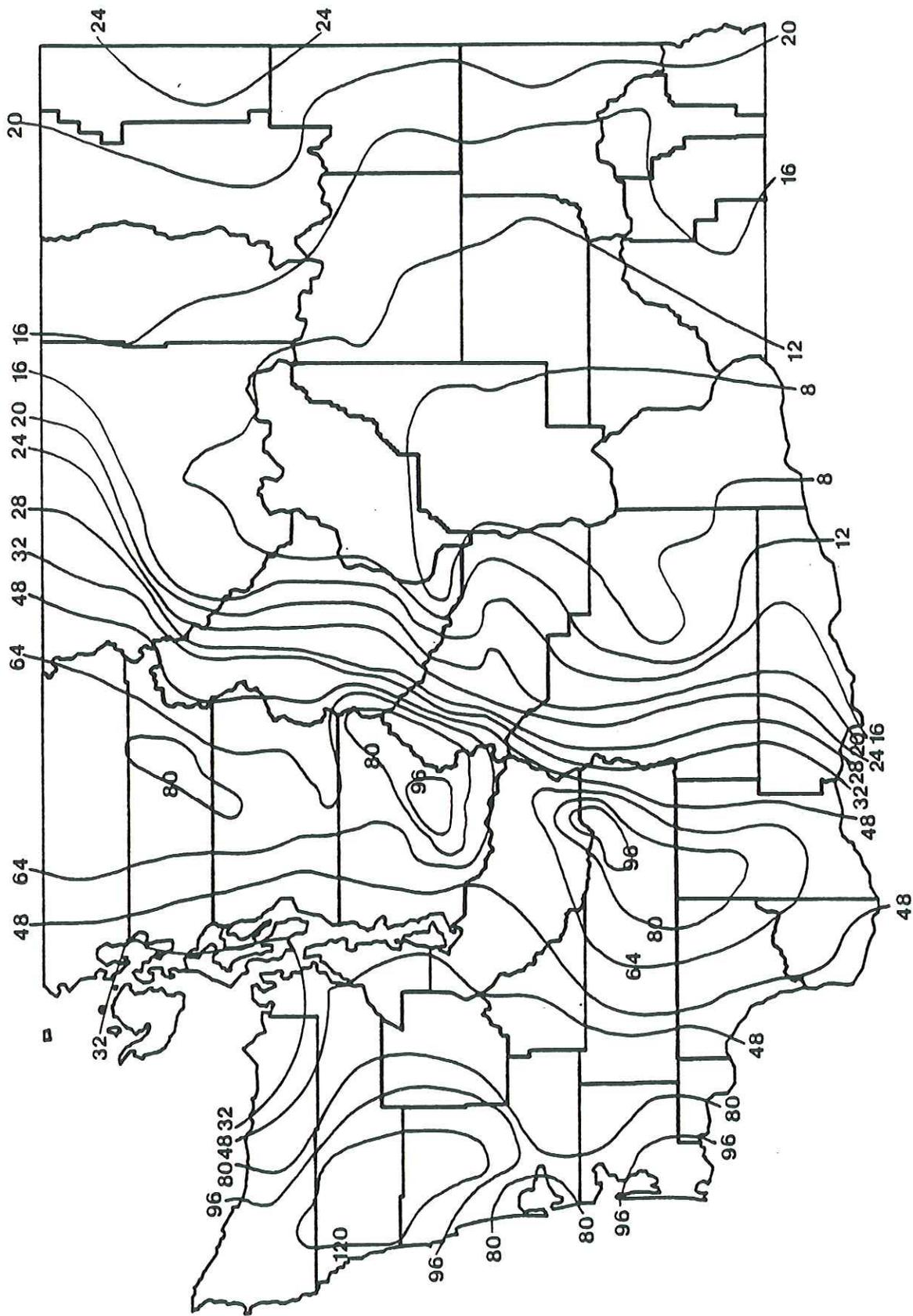
- 1985 Data By County -

## Percent



Source: U.S. Census Bureau

# MEAN ANNUAL PRECIPITATION, INCHES 1951-1980 Station Data



Source: National Oceanic & Atmospheric Administration

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## SECTION III

### QUANTITY OF WASTE HAULED AND DISPOSED

#### 1. PURPOSE

The objective of this task was to determine the total amounts of:

- o waste disposed in each WGA,
- o waste commercially or publicly collected and hauled to transfer stations or disposal sites, and
- o waste self-hauled to intermediate collection points or final disposal sites by individuals or companies not in the business of hauling waste.

The quantity of waste disposed within each WGA was determined. The amounts contributed by residential, commercial/institutional, and manufacturing sources were identified. All waste which enters or could potentially enter the municipal waste stream was included in this analysis.

#### 2. APPROACH

Two telephone surveys were conducted. The first survey queried county public works departments, solid waste disposal facilities (public and private), and all incorporated cities and towns in Washington State. The second survey covered all solid waste haulers in the State, both private and public.

The county surveys were used to determine:

- o The number and types of facilities in each county.
- o The amount of waste disposed at each facility in 1987 in tons or cubic yards.
- o The remaining permitted capacities for each landfill.
- o The design, permitted, and throughput capacities of each of the State's incinerators.
- o The haulers serving each county and the incorporated cities or towns.

The survey of haulers yielded the following data:

- o The total tons of waste collected by each hauler and the disposal sites they use.

- o The estimated amounts of residential and commercial waste collected and disposed by each hauler.

Follow-up calls were made after an initial analysis to verify data. All possible efforts were made to gather the most accurate and complete information available.

### 3. RESULTS

#### a. Counties

All 39 counties were surveyed. The names of all known landfills, transfer stations, and incinerators were obtained as well as the names of private haulers transporting solid waste in unincorporated areas of each county.

Information about county-owned facilities was obtained from the county public works and health departments.

#### b. Private Facilities

Privately-owned facilities were called separately to gather the needed information. All of these participated and provided as much information as was available.

#### c. Incorporated Cities and Towns

Of the 254 incorporated cities and towns called, 250 participated. Four cities did not answer the surveyor's calls. Of the 61 incorporated cities or towns which collect their own solid waste, 56 responded. The five which did not respond either lacked records or were not reached.

The initial survey of cities and towns provided information about the type of collection service. If the service was private, it was determined who the hauler or haulers were and whether they operated on a contract or a franchise.

#### d. Haulers

After reviewing the completed survey of the counties and incorporated cities and towns, a list of haulers, both public and private, was compiled, and the second survey was initiated.

In this survey, 103 private haulers were contacted. A total of 96 responded to the survey. Seven either did not respond, were hauling waste out of the State, or did not haul solid waste. Ten companies were

owned by Waste Management, Incorporated and seven by Rabanco, Limited. Those seventeen companies did not participate in the survey as individual companies. All information pertaining to those companies was obtained in aggregate (by WGA) from the main office for each corporation.

The survey of the haulers documented the amount of waste collected and disposed at each facility. The survey also asked for the amounts of residential and commercial waste handled by each hauler. The number of residential and commercial customers was obtained as well.

Table III-1, below, represents the total estimated amount of waste disposed in the State during 1987, broken out by WGA. The estimated amount hauled is the tonnage of solid waste hauled in 1987 to final disposal facilities by either licensed private solid-waste haulers or municipal haulers. The difference between the amount reaching final disposal facilities and the amount hauled indicates the estimated amount disposed of by private citizens or companies hauling their own waste (self-haul).

TABLE III-1

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey-1987  
WGA SUMMARY OF DISPOSAL AMOUNTS

<u>WGA</u>	<u>ESTIMATED WASTE DISPOSED</u>	<u>ESTIMATED HAULED AMOUNT</u>	<u>ESTIMATED COMMERCIAL % HAULED</u>	<u>ESTIMATED RESIDENTIAL % HAULED</u>	<u>ESTIMATED SELF-HAUL AMOUNT</u>
WEST	230,717	147,280	71	29	83,437
NORTHWEST	205,282	168,228	34	65	37,054
PUGET SOUND	2,273,999	1,876,563	39	61	397,436
SOUTHWEST	275,278	233,155	40	60	42,123
NORTH CENTRAL	203,748	95,152	39	61	108,596
SOUTH CENTRAL	195,125	132,750	55	45	62,375
NORTHEAST	403,076	289,650	48	52	113,426
SOUTHEAST	<u>294,869</u>	<u>175,447</u>	36	64	<u>119,422</u>
TOTAL:	4,082,094	3,118,225			963,869

## SECTION IV

### WASTE-STREAM COMPOSITION

#### 1. PURPOSE

The objective of this research was to determine waste composition by generator type. Generators included residential, commercial/institutional, manufacturing, and self-hauled sources. All waste which would potentially enter the municipal waste stream was considered in this analysis, including waste that is picked up by a public or private collector as well as that which is self-hauled to landfills, transfer stations, or drop boxes. Composition of the waste stream for each of these sources, including construction/demolition waste, was determined.

#### 2. APPROACH

Field sampling for waste-stream composition was conducted from November, 1987 through September, 1988. Samples totaling over 150,000 pounds were taken from 25 locations throughout the State. This sample size was calculated to represent the total waste stream with an acceptable level of accuracy.

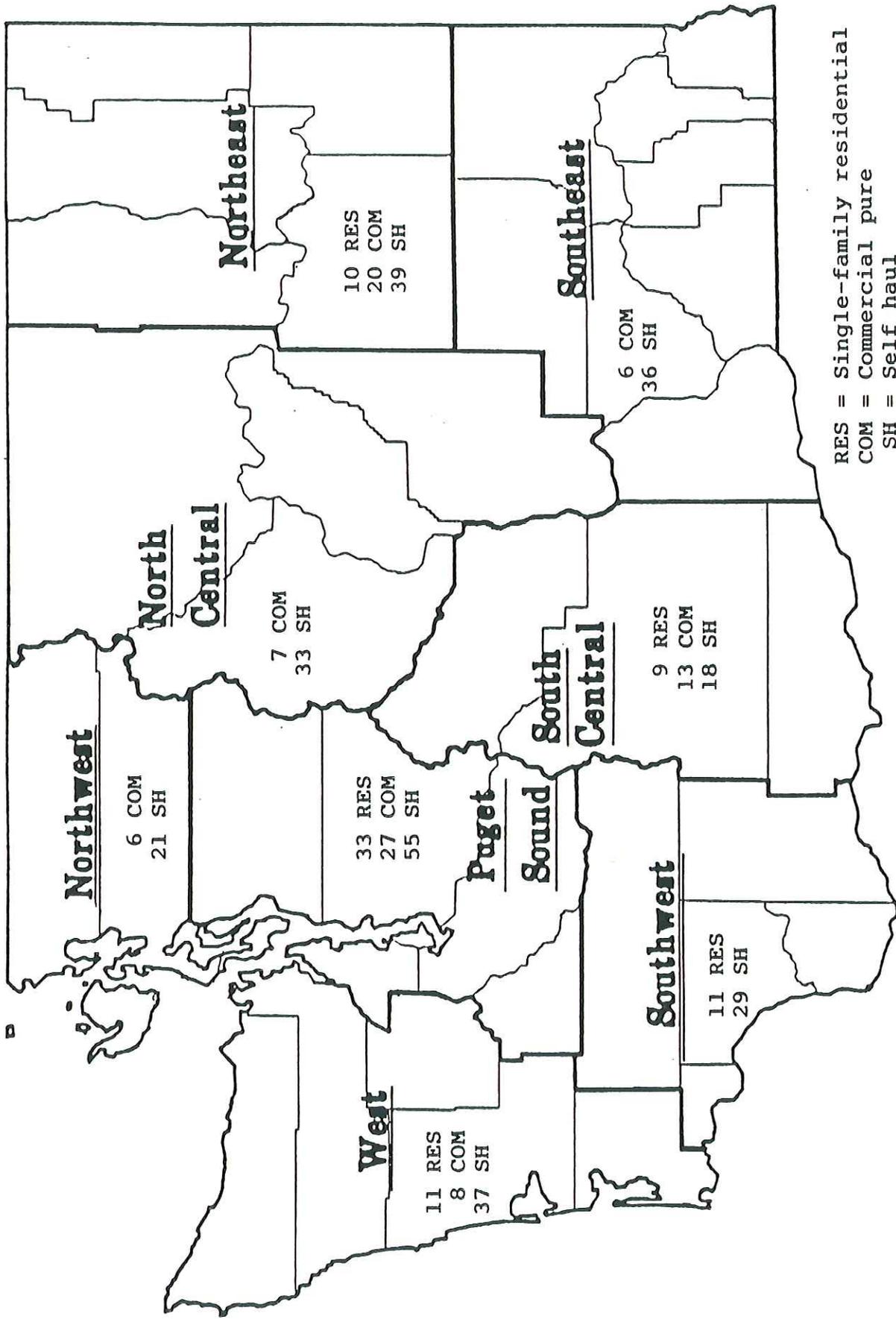
Of the 429 total samples, 74 were single-family residential, 256 were from self-haul vehicles, 12 were self-haul drop-boxes, and 87 were commercial pure loads. Specific locations and numbers of samples are listed in the Residential, Self-haul, and Commercial subsections, below. A map appears in Figure IV-1.

One hundred fifty-six waste-stream-composition surveys were completed for manufacturing businesses from Standard Industrial Classifications (SIC) 20 through 39. Additionally, 61 visual inspections were conducted to confirm survey results. The numbers of samples and SIC codes are described in the Manufacturing subsection, below.

A single standardized list of 39 waste-stream component categories was used to record all waste-stream composition information. These categories are listed in Table IV-1, below.

Sampling was supervised by the Matrix Management Group and R.W. Beck and Associates personnel. The Washington State Department of Ecology Conservation Corps Program provided the actual labor.

The data were recorded and a statistical database was established by the Gilmore Research Group. The data were then summarized by the Matrix Management Group for this report.



RES = Single-family residential  
 COM = Commercial pure  
 SH = Self haul

Figure IV-1

Field samplings of all waste types followed a consistent set of general procedures for sorting, weighing, and recording. These procedures are described below. Variations among waste types, such as composition and methods of transportation and delivery, also required procedures which were unique to the substream being sampled. Such procedures are noted in the following paragraphs.

Sampling was conducted by dumping the entire load in a windrow from 20 to 30 feet long. A sample was then taken from one side of this windrow. In this way, materials were taken from the bottom and top of the pile, as well as from the first through the final waste loaded. This ensured a representative sample from the entire route. Simply dumping a small amount would have provided a profile for only a small portion of the route.

The sample, after being placed on a tarp, was usually sorted first into its major component groups, e.g., papers, plastics, metals, etc. As these component groups accumulated, the crews began to sort into specific component categories. Experienced crews sorted directly into the individual categories for most items. Laundry baskets and clear polyethylene bags were used for sorting and weighing. As the sort progressed, the supervisor visually inspected the samples to ensure quality separation. Bags and boxes containing mixed waste were opened and dumped on the tarp for sorting. Medical waste, animal carcasses, and feces--present in all types of waste--were never sorted. Portions of the sample contaminated with such wastes may also have been discarded.

Ideally, each sample was completely sorted into the defined component categories. For certain samples which contained an appreciable amount by weight of small, mixed materials, it was not practical to sort this residue completely. Such "supermix" consisted of a homogeneous mixture of matter two inches square or less in size. The entire amount of supermix was weighed, and approximately 20% was retained as a "super-sample". This sample was then completely sorted into waste categories and weighed. The percentages of each component within the super sample were then applied to the entire amount of supermix. The supermix quantity was then added back into the overall sample by category of waste. In this way, miscellaneous categories such as "other organics" were minimized. The goal for sorting every sample, however, was to have no supermix remaining.

As components were weighed, the supervisor inspected them for purity and recorded their weight to the nearest four ounces or less (depending on the scale being used). Weights for items too heavy or too bulky for the scale were estimated.

TABLE IV-1  
WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey-1987  
WASTE-STREAM CATEGORY DEFINITIONS

GLASS

**NONREFILLABLE BEER BOTTLES:** All green, clear, or quart-sized beer bottles; all brown glass beer bottles not categorized as refillable.

**REFILLABLE BEER BOTTLES:** Brown glass bottles from western breweries, such as Rainier, Olympia, or Lucky.

**NONREFILLABLE SOFT DRINK BOTTLES:** All non-deposit soda pop, juice and water bottles of all colors.

**REFILLABLE SOFT DRINK BOTTLES:** Soda pop bottles, of any color, marked as deposit or refillable by the manufacturer.

**CONTAINER GLASS:** All glass food containers, wine and wine cooler bottles, and other glass containers of any color.

**NONRECYCLABLE GLASS:** Window glass, light bulbs, glassware, etc.

METALS

**ALUMINUM CANS:** Aluminum beverage cans.

**ALUMINUM CONTAINERS:** Aluminum food containers and aluminum foil.

**TIN CANS:** Tin coated steel food containers.

**BI-METAL CANS:** Steel/aluminum food and beverage cans.

**MIXED METALS/MATERIALS:** Small appliances, motors, insulated wire, and finished products containing a mixture of metals, or other materials, whose weight is mostly metal.

**FERROUS METALS:** Ferrous and alloyed ferrous scrap metals, to which a magnet adheres, which are not significantly contaminated with other metals or materials.

**WHITE GOODS:** Large household appliances or parts thereof.

**NON-FERROUS METALS:** Metals not derived from iron, to which a magnet will not adhere, which are not significantly contaminated with other metals or materials.

## PAPER

**NEWSPRINT:** Printed groundwood newsprint, including advertising "slicks" (glossy paper), unless found separately.

**CORRUGATED CONTAINERS:** Unwaxed kraft paper corrugated containers and boxes, unless laminated with other paper such as glossy stock. Includes also brown kraft paper bags.

**COMPUTER PAPER:** Continuous-feed computer printouts and forms of all types, except multiple-copy carbonless paper.

**OFFICE PAPER:** High-grade white or light colored bond and copy machine papers and envelopes.

**MIXED WASTE PAPER:** Low grade potentially recyclable papers, including magazines, colored papers, non-corrugated paperboard, and paperback books.

**NONRECYCLABLE PAPER:** Contaminated papers including carbon/carbonless copy paper, tissues, paper towels, paper plates, waxed papers, frozen food containers, envelopes with plastic windows, paper packaging with metal or plastic parts, and hardcover books.

## PLASTIC

**PET BOTTLES:** Polyethylene terephthalate 2-liter pop bottles, with or without base, and PET liquor bottles.

**HDPE BOTTLES:** High-density polyethylene milk and juice containers.

**PLASTIC PACKAGING:** All plastic packaging films, and shipping materials and other plastic items which are not themselves finished consumer products, including thermoplastics and thermosetting plastics used as packaging.

**OTHER PLASTIC PRODUCTS:** Finished plastic products such as toys, toothbrushes, vinyl hose and shower curtains. Includes fiberglass resin products and materials.

**EXPANDED POLYSTYRENE:** Includes packaging and finished products made of expanded polystyrene.

## RUBBER

**RUBBER PRODUCTS:** Finished products and scrap materials made of rubber, such as bath mats, inner tubes, rubber hose and foam rubber.

**TIRES:** Vehicle tires of all types.

## ORGANIC

**FOOD:** Food wastes and scraps, including bone, rinds, etc., including the food container when the container weight is not appreciable compared to the food inside.

**YARD AND GARDEN WASTE:** Grass clippings, leaves and weeds, prunings 6" or less in diameter.

**WOOD:** Finished lumber, products made of wood, and prunings or stumps 6" or greater in diameter.

## OTHER

**DISPOSABLE DIAPERS:** Disposable baby diapers and protective undergarments.

**TEXTILES:** Cloth, material fiber rope, rubberized cloth.

**LEATHER:** Finished products or scraps of leather.

**INERT MATERIAL AND FINES:** Includes rock gravel, portland cement mixtures (set or unset), and fired-clay bricks. Includes non-distinct fines smaller than 2" in size.

**ASH:** Fireplace, burn barrel or firepit ash.

**CONSTRUCTION DEBRIS:** Construction debris, other than wood, which could not be classified into other component categories, i.e., asphalt shingles, mixed fine material scraps. Includes gypsum wallboard and fiberglass insulation.

## HAZARDOUS

**HAZARDOUS HOUSEHOLD SUBSTANCES:** Adhesives, paints, caustic cleaners, pesticides, batteries, petroleum products, asbestos, explosives and other chemicals, excluding spent or empty hazardous waste containers.

3. RESIDENTIAL WASTE STREAM

a. Methodology

A total of 74 single-family residential samples were examined. Samples were taken during November, 1987 through September, 1988. Each site was sampled twice approximately six months apart. Sampling was distributed throughout the season or year. Sample loads were preselected by the participating hauler to provide an average of five loads during any given day of sampling. If single-family loads were not due to arrive at the disposal site until late morning (or if fewer than five loads were due during the entire sampling day), loads from the previous day were held over for sampling. The communities in which the residential waste stream was sampled and the number of samples taken during each time period are listed in Table IV-2.

TABLE IV-2  
WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey-1987  
NUMBER OF RESIDENTIAL SAMPLES BY LOCATION AND SEASON

	Fall <u>87</u>	Winter <u>87/88</u>	Spring <u>88</u>	Summer <u>88</u>
Aberdeen	4		6	
Forks			1	
Olympia	3		4	
Pierce County	5		6	
Seattle	8		7	
Spokane		4		6
Vancouver		6		5
Yakima		4		5

Fall = September/October/November  
Winter = December/January/February  
Spring = March/April/May  
Summer = June/July/August

b. Results

The 74 samples averaged 413 pounds each. The results of the residential waste-stream survey are displayed in Table IV-3.

**TABLE IV-3**  
**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey-1987**  
**RESIDENTIAL WASTE-STREAM SURVEY**

<u>CATEGORIES</u>	<u>% BY WEIGHT</u>
<b>GLASS</b>	
Nonrefillable Beer Bottles	1.2
Refillable Beer Bottles	0.3
Nonrefillable Soft Drink Bottles	0.9
Refillable Soft Drink Bottles	0.0
Container Glass	4.6
Nonrecyclable Glass	0.2
<b>METAL</b>	
Aluminum Cans	0.8
Aluminum Containers	0.2
Tin Cans	2.5
Bi-Metal Cans	0.0
Mixed Metals/Materials	0.8
Ferrous Metals	0.6
White Goods	0.1
Nonferrous Metals	0.1
<b>PAPER</b>	
Newsprint	5.7
Corrugated Containers	4.8
Computer Paper	0.1
Office Paper	0.3
Mixed Waste Paper	14.0
Nonrecyclable Paper	5.6
<b>PLASTICS</b>	
PET Bottles	0.4
HDPE Bottles	0.5
Plastic Packaging	5.9
Other Plastic Products	0.8
Expanded Polystyrene	0.4
<b>RUBBER</b>	
Rubber Products	0.3
Tires	0.5
<b>ORGANIC</b>	
Food	10.9
Lawn and Garden Waste	22.3
Wood Waste	1.2
<b>OTHER</b>	
Disposable Diapers	3.2
Textiles	3.1
Leather	0.2
Inert Material and Fines	6.5
Ash	0.1
Construction Debris (other than wood)	0.6
<b>HOUSEHOLD HAZARDOUS</b>	
Batteries	0.1
Oil	0.2
Other Chemicals	0.1

#### 4. COMMERCIAL WASTE STREAM

##### a. Methodology

This study was conducted to determine waste-stream composition and waste generation rates for types of commercial generators grouped by Standard Industrial Classification (SIC) codes.

Several tasks were required to conduct the commercial waste-stream sampling study:

- o define the "pure-load" categories.
- o identify the sorting sites.
- o conduct the waste composition sorts.
- o collect the waste generator data.
- o analyze the data to produce waste-stream composition and waste generation rates for each "pure-load" category.

##### (1) Commercial Waste Generator Categories

Seven commercial waste generator categories were identified for this commercial pure-load study. The waste generator categories involved the following Standard Industrial Classifications (SICs):

###### Contract Construction

- 150 Building construction--general contractors
- 160 Construction--other
- 170 Construction--special trade contractors

###### Transportation, Communications, Electric, Gas, and Sanitary Services

- 400 Railroad transportation
- 410 Local and passenger transportation
- 420 Motor freight and transportation warehousing
- 440 Water transportation
- 450 Transportation by air
- 460 Pipeline transportation
- 470 Transportation services
- 480 Communication
- 490 Electric, gas, and sanitary services

###### Wholesale Trade

- 500 Durable goods
- 510 Nondurable goods

#### Retail Trade

- 520 Building materials, hardware, etc.
- 530 General merchandise
- 540 Food stores
- 550 Automotive dealers and gas stations
- 560 Apparel and accessories
- 570 Furniture, home furnishings, etc
- 580 Eating and drinking places
- 590 Miscellaneous retail stores

#### Finance, Insurance, and Real Estate

- 600 Banking
- 610 Credit agencies other than banks
- 620 Security brokers, dealers, etc.
- 630 Insurance carriers
- 640 Insurance agents and brokers
- 650 Real estate
- 660 Combinations of real estate, insurance, loans, and law offices
- 670 Holding and other investment companies

#### Services

- 700 Hotels, motels, and trailer parks
- 720 Personal services
- 730 Business services
- 750 Automobile repair and services
- 760 Miscellaneous repair services
- 780 Motion pictures
- 790 Amusement and recreation services
- 800 Medical and other health services
- 810 Legal services
- 820 Educational services
- 830 Social services
- 840 Museums, art galleries
- 860 Nonprofit membership organizations
- 880 Businesses in private households
- 890 Miscellaneous services

#### Public Administration

- 910 Executive, legislative, general, except finance
- 920 Justice, public order and safety
- 930 Public finance, taxation, and monetary policy
- 940 Administration of human resources programs
- 950 Administration of environmental quality and housing programs
- 960 Administration of economic programs
- 970 National security and international affairs

The seven categories and associated SIC codes are:

<u>Category</u>	<u>SIC codes</u>
1. Retail/Wholesale	500-570, and 590
2. Office	600-670 and 810
3. Restaurant	580
4. Education Facilities	820
5. Other Services	400-420, 440-490, 700-790, 830-890
6. Government	430, 910-970
7. Construction*	150-170

\* Waste generation rates were not calculated for this category since the generation of construction or demolition waste relates only to each building and not to the number of employees working at each site.

## (2) Sampling Site Selection

The number of sites selected was primarily limited by the total number of samples required by the overall study (approximately 40 of which were to be conducted in either Seattle or Spokane and approximately 50 to reflect a number of other urbanized areas within the State of Washington). From January, 1988 through September, 1988, sampling was conducted in Snohomish County and in the cities of Seattle, Spokane, Aberdeen, Wenatchee, Ellensburg, Bellingham, Yakima, and Kennewick. The criteria used in selecting the sites included:

- Availability of representative commercial enterprises.
- Willingness of landfill or transfer station operators to participate in this study through use of their facilities during the one- or two-day sorting periods.
- Willingness of commercial waste haulers, whether public or private entities, to collect and deliver the pure-load samples as specified by this study.
- Willingness of the commercial waste haulers to provide other information regarding specific waste generators and their annual tonnages of waste disposed.
- Availability of truck scales to weigh the hauling vehicles in and out of the disposal or transfer facilities.

Sites that were considered but not selected into the sample due to a weakness in one or more of the criteria included the cities of Tacoma, Olympia, and Vancouver.

(3) Sampling

After the sorting sites were identified, a more detailed discussion took place with each commercial waste hauler regarding the types of businesses to include in each "pure-load" category. For each of the "pure-load" categories, the hauler was instructed to collect waste from four to six businesses or institutions representing that category. Often, the hauler would draft a list of the businesses to be collected, and this list was then reviewed by R. W. Beck or Matrix Management Group personnel to ensure that the businesses properly fit the categories. On the predetermined dates, the "pure-loads" were then delivered to the disposal facilities for sorting.

The sample size averaged 430 pounds. An average of seven truckloads were sampled at each site over a one- or two-day period. The number of loads sampled depended on what types of "pure-loads" were actually available to the hauler. For instance, educational facilities were not sampled if the local schools were not in session. Table IV-4 lists the number and type of loads sorted at each location.

TABLE IV-4  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 NUMBER OF COMMERCIAL PURE SAMPLES BY LOCATION AND GENERATOR

	Retail	Office	Restau- rant	Edu- cation	Other Services	Govern- ment	Construc- tion	Location Totals
Aberdeen	1	1	1	1	2	1	1	8
Bellingham	1	1	1	1	1	1		6
Ellensburg	1	1	2		1	1		6
Kennewick		1	1	1	2	1		6
Seattle	3	3	3	3	3	3	3	21
Snohomish County	1	1	1		1	1	1	6
Spokane	5	2	3	2	2	3	3	20
Wenatchee	1	1	1		2	1	1	7
Yakima	1	1	1	1	2	1		7
Category Totals	14	12	14	9	16	13	9	87

(4) Waste Generator Data

After the sorting at each site was completed, a list of every business included in each pure-load was obtained from the hauler. The names of these businesses shall remain confidential. Each business was contacted by letter and/or telephone and asked to respond to a questionnaire which requested the following information:

- Number of employees
- Seating capacity (restaurants only)
- Square-footage of business place
- Annual sales
- Number and type of containers used for waste disposal
- Frequency of garbage pickup
- Description of in-house recycling programs

When the requested information was not directly provided or available from each business, other public sources of information, such as a computer information service produced by Dun and Bradstreet, were researched. Research on each business was halted after exhausting both of these avenues.

For each business or "pure-load" category, the commercial haulers provided the number and size (usually in cubic-yard capacity) of disposal containers and their frequency of collection.

b. Results

Please see Table IV-5 for the waste-composition listing for each "pure-load" category.

For the purpose of projecting total commercial waste quantities for the State of Washington within each of the "pure-load" categories, unit waste-generation rates were computed by dividing the total annual waste produced from the sampled businesses or institutions by the total number of employees or students. The total annual waste produced by sampled businesses was provided by the commercial waste haulers.

The total number of employees in sampled businesses was provided either directly by each business or through a secondary public information source. The total number of employees represented the number of employees that were full-time equivalents (FTE). Waste generation rates were estimated on a per-employee basis since employee data is available Statewide by county through the U.S. Department of Commerce, Bureau of the Census, County Business Patterns guide for the State of Washington, and could then be applied to each of the Waste Generation Areas.

The unit waste rates were computed as follows:

$$\begin{aligned} & (1) \quad \underline{\text{Retail/wholesale}} \\ \text{Generation Rate} &= \\ & \frac{\underline{\text{Total Annual Waste Produced by Sampled Retail/Wholesale Operations}}}{\underline{\text{Total Number of FTE Employees}}} \\ &= 2.29 \text{ Tons/Employee/Year} \end{aligned}$$

$$\begin{aligned} & (2) \quad \underline{\text{Office}} \\ \text{Generation Rate} &= \\ & \frac{\underline{\text{Total Annual Waste Produced by Sampled Offices}}}{\underline{\text{Total Number of FTE Employees*}}} \\ &= 0.28 \text{ Tons/Employee/Year} \end{aligned}$$

\*The waste sampled from offices usually was collected from office buildings. Specific information as to the number of employees of each of the businesses within the sampled office buildings was often difficult if not impossible to obtain. However, square footage of rented or leased space within each building was available. To derive the number of employees per building, an architect's planning estimate of an average of 125 square feet per employee was used.

$$\begin{aligned} & (3) \quad \underline{\text{Restaurants}} \\ \text{Generation Rate} &= \\ & \frac{\underline{\text{Total Annual Waste Produced by Sampled Restaurants}}}{\underline{\text{Total Number of FTE Employees}}} \\ &= 3.14 \text{ Tons/Employee/Year} \end{aligned}$$

$$\begin{aligned} & (4) \quad \underline{\text{Other Services}} \\ \text{Generation Rate} &= \\ & \frac{\underline{\text{Total Annual Waste Produced by Sampled Other Services}}}{\underline{\text{Total Number of FTE Employees}}} \\ &= 1.68 \text{ Tons/Employee/Year} \end{aligned}$$

(5) Education Facilities

Generation Rate =

$$\frac{\text{Total Annual Waste Produced by Sampled Educational Facilities}}{\text{Total Student Population}}$$

= 0.12 Tons/Student/Year

(6) Government

Generation Rate =

$$\frac{\text{Total Annual Waste Produced by Sampled Governmental Agencies}}{\text{Total Number of FTE Employees}}$$

= 0.59 Tons/Employee/Year

A very large number of businesses exist in the State, many of which have unique solid-waste characteristics both in composition and generation rates. The scope of this study allowed for comprehensive sampling of the total commercial waste stream and provided limited information on each of the "pure-load" samples.

TABLE IV-5  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 COMMERCIAL "PURE-LOAD" SAMPLES

<u>CATEGORIES</u>	<u>% BY WEIGHT</u>			
	<u>Offices</u>	<u>Restrnt.</u>	<u>Retail</u>	<u>Construction</u>
<b>GLASS</b>				
Nonrefillable Beer Bottles	1.1	1.7	0.4	0.1
Refillable Beer Bottles	0.1	0.2	0.1	0.2
Nonrefillable Soft Drink Bottles	0.7	0.5	0.9	0.2
Refillable Soft Drink Bottles	0.1	0.0	0.0	0.0
Container Glass	0.9	3.4	0.9	0.3
Nonrecyclable Glass	1.0	0.1	0.2	0.0
<b>METAL</b>				
Aluminum Cans	0.5	0.5	0.2	0.1
Aluminum Containers	0.0	0.2	0.2	0.1
Tin Cans	0.2	3.8	0.2	0.0
Bi-Metal Cans	0.0	0.0	0.0	0.0
Mixed Metals/Materials	1.3	0.2	4.9	0.1
Ferrous Metals	0.9	0.2	14.6	5.2
White Goods	0.0	0.0	0.0	0.1
Nonferrous Metals	0.0	0.0	0.4	0.2
<b>PAPER</b>				
Newsprint	3.6	2.5	2.9	0.9
Corrugated Containers	11.5	15.6	22.0	5.5
Computer Paper	3.8	0.0	1.0	0.1
Office Paper	6.8	0.0	0.4	0.0
Mixed Waste Paper	29.0	4.4	10.3	3.6
Nonrecyclable Paper	9.5	14.1	4.9	2.1
<b>PLASTICS</b>				
PET Bottles	0.1	0.0	0.1	0.0
HDPE Bottles	0.0	0.1	0.0	0.0
Plastic Packaging	3.2	8.7	7.9	4.1
Other Plastic Products	0.4	0.9	3.4	0.7
Expanded Polystyrene	0.6	4.0	0.6	0.8
<b>RUBBER</b>				
Rubber Products	0.0	0.0	0.9	0.6
Tires	0.0	0.0	0.0	0.0
<b>ORGANIC</b>				
Food	3.0	36.0	8.1	0.0
Lawn and Garden Waste	2.5	0.4	1.1	0.0
Wood Waste	5.3	0.2	9.6	32.6
<b>OTHER</b>				
Disposable Diapers	0.0	0.2	0.0	0.0
Textiles	6.3	0.4	1.2	1.1
Leather	0.0	0.0	0.0	0.0
Inert Material and Fines	1.0	1.2	1.6	27.2
Ash	0.1	0.0	0.0	0.0
Construction Debris (other than wood)	4.2	0.2	0.6	13.9
<b>HOUSEHOLD HAZARDOUS</b>				
Batteries	0.0	0.0	0.0	0.0
Oil	2.3	0.0	0.0	0.0
Other Chemicals	0.2	0.2	0.3	0.3

TABLE IV-5 Continued

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
Commercial "Pure-Load" Samples

<u>CATEGORIES</u>	<u>% BY WEIGHT</u>		
	<u>Eductn.</u>	<u>Gvrnnt.</u>	<u>Other</u>
<b>GLASS</b>			
Nonrefillable Beer Bottles	0.2	0.5	0.7
Refillable Beer Bottles	0.0	0.1	0.4
Nonrefillable Soft Drink Bottles	0.6	1.1	0.5
Refillable Soft Drink Bottles	0.0	0.0	0.0
Container Glass	0.2	0.7	0.8
Nonrecyclable Glass	2.2	0.3	4.8
<b>METAL</b>			
Aluminum Cans	0.8	0.5	0.4
Aluminum Containers	0.6	0.3	0.0
Tin Cans	0.2	0.4	0.4
Bi-Metal Cans	0.0	0.0	0.0
Mixed Metals/Materials	0.7	6.4	1.7
Ferrous Metals	3.0	2.2	5.7
White Goods	0.0	0.0	0.0
Nonferrous Metals	0.5	0.0	0.1
<b>PAPER</b>			
Newsprint	3.3	6.7	3.7
Corrugated Containers	11.6	8.4	11.6
Computer Paper	1.9	3.1	1.6
Office Paper	4.4	4.1	3.2
Mixed Waste Paper	21.6	25.0	7.9
Nonrecyclable Paper	5.0	6.5	6.0
<b>PLASTICS</b>			
PET Bottles	0.1	0.1	0.1
HDPE Bottles	0.0	0.0	0.0
Plastic Packaging	4.2	2.5	3.8
Other Plastic Products	0.3	0.7	2.7
Expanded Polystyrene	0.5	0.2	0.4
<b>RUBBER</b>			
Rubber Products	0.6	0.2	7.3
Tires	1.3	1.2	5.9
<b>ORGANIC</b>			
Food	14.0	3.2	3.5
Lawn and Garden Waste	17.5	7.8	1.4
Wood Waste	3.5	12.2	8.4
<b>OTHER</b>			
Disposable Diapers	0.2	0.0	0.3
Textiles	0.4	0.8	10.3
Leather	0.0	0.1	0.0
Inert Material and Fines	0.1	1.5	3.5
Ash	0.0	0.3	0.0
Construction Debris (other than wood)	0.0	2.5	2.3
<b>HOUSEHOLD HAZARDOUS</b>			
Batteries	0.0	0.0	0.2
Oil	0.0	0.1	0.0
Other Chemicals	0.1	0.2	0.0

## 5. MANUFACTURING WASTE STREAM

### a. Methodology

Initially, ten firms were randomly selected from each manufacturing Standard Industrial Classification (SIC) using the 1988-1989 Washington Manufacturers Register. These SICs included:

200	Food and kindred products
210	Tobacco
220	Textile mill products
230	Apparel and other textile products
240	Lumber and wood products
250	Furniture and fixtures
260	Paper and allied products
270	Printing and publishing
280	Chemicals and allied products
290	Petroleum and coal products
300	Rubber and plastics products
310	Leather and leather products
320	Stone, clay, and glass products
330	Primary metal industries
340	Fabricated metal products
350	Machinery, except electrical
360	Electric and electronic equipment
370	Transportation equipment
380	Instruments and related products
390	Miscellaneous manufacturing industries

If there were fewer than twenty firms in a given SIC, then all the firms listed were used in our sample. There were no firms listed under SIC 210, Tobacco Products.

Waste composition surveys were mailed to each firm selected, and follow-up telephone interviews were conducted. Information requested by the survey included the annual tonnage of waste generated, a breakdown of this waste by percent composition into the 39 categories outlined on page 44, above, and authorization for the Matrix Management Group to conduct onsite inspections if needed to verify results. Persons filling out the survey were instructed to consider only that waste which was entering the municipal waste stream, and when approximating percent composition, to provide numbers reflecting annual averages. The information was subsequently returned by mail or collected over the telephone. A copy of the survey form appears at the end of this section.

The initial sample included 223 manufacturing firms. However, due to poor response rates in a number of SICs, it was necessary to send out an additional 36 surveys in order to achieve a desired minimum sample of five firms from each SIC, at least three of which granted permission for onsite inspections. The final sample, therefore, included 259 firms, 159 of which responded, giving a response rate just over 61%. Locations and sizes of firms sampled and responding

may be found in Tables IV-6 and -7, and a breakdown of sample size by SIC may be found in Table IV-8.

TABLE IV-6  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 FIRMS SAMPLED AND RESPONDING BY LOCATION

<u>Location</u>	<u># Sampled</u>	<u>%</u>	<u># Responding</u>	<u>%</u>
Seattle	83	32	43	27.0
Tacoma	24	9	15	9.5
Other Western Washington	104	40	69	43.0
Spokane	23	9	15	9.5
Other Eastern Washington	<u>25</u>	<u>10</u>	<u>17</u>	<u>11.0</u>
	259	100%	159	100%

TABLE IV-7  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 FIRMS SAMPLED AND RESPONDING BY SIZE

<u># Employees</u>	<u># Sampled</u>	<u>%</u>	<u># Responding</u>	<u>%</u>
1-19	113	47	81	51
20-99	90	37	56	35
100-249	17	7	9	5
250-999	19	8	12	8
1000+	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>
	241*	100%	159	100%

\* Unable to obtain data regarding employee numbers for 18 firms.

TABLE IV-8  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987

FIRMS RESPONDING BY SIC

<u>SIC</u>	<u># Responding</u>
200	6
210	0
220	9
230	7
240	9
250	12
260	8
270	6
280	9
290	9
300	10
310	9
320	9
330	8
340	11
350	7
360	7
370	6
380	10
390	<u>7</u>

159

Onsite inspections were conducted at 61 firms throughout the State, three from each SIC plus an additional four who had indicated that they had no time to participate in the study, but who were willing to allow the Matrix Management Group to inspect their garbage. Of the 159 firms who participated, 98 provided authorization for onsite inspections. Within each SIC, firms were selected at random from the pool of respondents who had provided authorization for inspections. Efforts were made to achieve a representative distribution of locations and sizes of firms being inspected. In addition, any firm which had provided questionable data was automatically included in the sample of 61. Table IV-9 provides a breakdown of firms inspected by location.

TABLE IV-9  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 FIRMS INSPECTED BY LOCATION

<u>Location</u>	<u># Inspected</u>	<u>%</u>
Seattle	18	30
Tacoma	5	8
Other Western Washington	24	39
Spokane	5	8
Other Eastern Washington	<u>9</u>	<u>15</u>
	61	100%

Firms selected for inspection were contacted to determine when their dumpsters were emptied so that, once authorization was received, a visit could be scheduled at a time when a full dumpster was available. An inspection consisted of a simple visual analysis of the contents of a dumpster, and a comparison of what was seen with the percent composition provided by a particular firm. If a discrepancy existed which was too large to be explained by monthly/seasonal variation in the type of waste generated, then the person who filled out the survey was contacted to determine the source of the discrepancy. In 30% of the cases, it was deemed appropriate to adjust the numbers to obtain more accurate results.

b. Results

For the purpose of projecting total manufacturing waste quantities for the State of Washington, the Matrix Management Group computed per-employee waste-generation rates for each SIC by dividing the total annual waste produced from the sampled manufacturing firms by the total number of employees working for these firms. Table IV-10 provides a compiled list of manufacturing waste-generation rates by SIC. Once all the final composition figures were received, the data were entered into a statistical database established by the Gilmore Research Group. The data were then summarized by the Matrix Management Group for this report. Composition percentages by SIC are shown in Table IV-11.

TABLE IV-10  
WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey-1987  
MANUFACTURING GENERATION RATES BY SIC

<u>SIC</u>	<u>Generation Rate</u> (tons/employee/year)
200	0.27
210	---
220	0.82
230	0.72
240	2.44
250	1.61
260	8.85
270	0.66
280	0.73
290	1.95
300	1.72
310	8.61
320	0.73
330	1.96
340	1.67
350	0.47
360	0.59
370	1.23
380	0.94
390	0.74

TABLE IV-11  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 MANUFACTURING WASTE COMPOSITION BY SIC  
 SIC CODES

<u>CATEGORIES</u>	<u>200</u>	<u>220</u>	<u>230</u>	<u>240</u>
<b>GLASS</b>				
Nonrefillable Beer Bottles	0.0	0.0	0.0	15.8
Refillable Beer Bottles	0.0	0.0	0.0	0.0
Nonrefillable Soft Drink Bottles	0.1	0.3	0.2	0.1
Refillable Soft Drink Bottles	0.0	0.0	0.0	0.0
Container Glass	0.0	0.0	0.0	0.0
Nonrecyclable Glass	0.8	0.2	0.0	0.2
<b>METAL</b>				
Aluminum Cans	0.4	0.1	0.0	0.1
Aluminum Containers	0.0	0.0	0.0	0.0
Tin Cans	0.6	0.4	0.7	0.0
Bi-Metal Cans	0.0	0.1	0.0	0.0
Mixed Metals/Materials	1.2	0.1	1.1	0.1
Ferrous Metals	0.6	0.0	0.1	4.9
White Goods	0.0	0.0	0.0	0.0
Nonferrous Metals	0.6	0.0	0.0	0.0
<b>PAPER</b>				
Newsprint	0.2	0.0	0.0	0.0
Corrugated Containers	12.7	5.9	1.5	0.8
Computer Paper	1.6	2.9	0.3	0.8
Office Paper	2.6	3.4	7.4	4.1
Mixed Waste Paper	7.7	4.3	0.8	1.6
Nonrecyclable Paper	11.4	1.0	4.8	1.0
<b>PLASTICS</b>				
PET Bottles	0.0	0.0	0.0	0.0
HDPE Bottles	0.0	0.0	0.2	0.1
Plastic Packaging	21.6	0.4	0.2	0.5
Other Plastic Products	0.9	23.4	0.0	0.1
Expanded Polystyrene	7.0	0.2	0.0	0.1
<b>RUBBER</b>				
Rubber Products	0.6	0.0	0.5	0.1
Tires	0.0	0.0	0.0	0.2
<b>ORGANIC</b>				
Food	9.4	1.5	0.7	15.9
Lawn and Garden Waste	1.0	0.0	0.0	0.0
Wood Waste	9.4	0.6	0.0	37.1
<b>OTHER</b>				
Disposable Diapers	0.0	0.0	0.0	0.0
Textiles	0.6	37.9	66.5	0.1
Leather	0.0	0.1	14.0	0.0
Inert Material and Fines	5.0	15.8	0.0	0.1
Ash	0.0	0.0	0.0	0.0
Construction Debris (other than wood)	2.7	0.0	0.0	0.2
<b>HOUSEHOLD HAZARDOUS</b>				
Batteries	0.0	0.0	0.0	0.0
Oil	0.0	0.2	0.0	0.0
Other Chemicals	1.2	0.9	0.7	15.9

TABLE IV-11-Continued  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 MANUFACTURING WASTE COMPOSITION BY SIC

<u>CATEGORIES</u>	<u>SIC CODES</u>			
	<u>250</u>	<u>260</u>	<u>270</u>	<u>280</u>
<b>GLASS</b>				
Nonrefillable Beer Bottles	0.0	0.0	0.0	0.0
Refillable Beer Bottles	0.0	0.0	0.0	0.0
Nonrefillable Soft Drink Bottles	0.3	0.0	0.0	0.0
Refillable Soft Drink Bottles	0.0	0.0	0.0	0.0
Container Glass	0.2	0.0	0.0	1.8
Nonrecyclable Glass	5.4	1.1	0.5	1.8
<b>METAL</b>				
Aluminum Cans	0.5	0.2	0.0	0.0
Aluminum Containers	0.0	0.1	0.0	0.0
Tin Cans	0.4	0.1	0.0	1.1
Bi-Metal Cans	0.0	0.0	0.0	0.0
Mixed Metals/Materials	0.0	0.0	0.0	1.2
Ferrous Metals	3.5	0.1	27.7	0.2
White Goods	0.0	0.0	0.0	0.0
Nonferrous Metals	0.3	0.0	0.0	0.5
<b>PAPER</b>				
Newsprint	0.0	1.0	2.4	0.8
Corrugated Containers	3.0	13.3	0.2	11.9
Computer Paper	1.1	3.0	0.3	0.4
Office Paper	0.5	2.3	1.9	7.6
Mixed Waste Paper	2.2	1.6	2.3	18.7
Nonrecyclable Paper	1.3	6.6	18.8	6.0
<b>PLASTICS</b>				
PET Bottles	0.0	0.0	0.0	0.0
HDPE Bottles	0.0	0.8	0.0	1.2
Plastic Packaging	4.0	0.8	1.0	19.3
Other Plastic Products	2.5	7.0	36.9	1.8
Expanded Polystyrene	0.4	0.1	0.9	0.4
<b>RUBBER</b>				
Rubber Products	0.3	0.9	0.9	1.8
Tires	0.0	0.0	0.0	0.0
<b>ORGANIC</b>				
Food	0.4	0.6	0.9	1.8
Lawn and Garden Waste	0.4	1.2	0.5	2.6
Wood Waste	47.9	5.9	0.9	6.5
<b>OTHER</b>				
Disposable Diapers	0.0	0.0	0.0	0.0
Textiles	14.5	0.6	0.0	0.0
Leather	0.0	0.0	0.0	0.0
Inert Material and Fines	10.0	35.6	0.0	10.1
Ash	0.0	11.4	0.0	0.0
Construction Debris (other than wood)	1.1	1.2	1.4	1.1
<b>HOUSEHOLD HAZARDOUS</b>				
Batteries	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0
Other Chemicals	0.0	4.3	2.3	1.7

TABLE IV-11-Continued  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 MANUFACTURING WASTE COMPOSITION BY SIC

<u>CATEGORIES</u>	<u>SIC CODES</u>			
	<u>290</u>	<u>300</u>	<u>310</u>	<u>320</u>
<b>GLASS</b>				
Nonrefillable Beer Bottles	0.0	0.0	0.0	0.0
Refillable Beer Bottles	0.0	0.0	0.0	0.0
Nonrefillable Soft Drink Bottles	0.4	0.0	0.0	0.1
Refillable Soft Drink Bottles	0.0	0.0	0.0	0.0
Container Glass	1.6	0.0	0.0	0.6
Nonrecyclable Glass	2.2	0.2	0.0	16.9
<b>METAL</b>				
Aluminum Cans	0.5	0.1	0.0	0.3
Aluminum Containers	0.2	0.0	0.0	0.0
Tin Cans	4.4	0.0	0.0	0.3
Bi-Metal Cans	1.2	0.0	0.0	0.0
Mixed Metals/Materials	0.0	2.2	0.0	1.4
Ferrous Metals	0.5	0.4	0.0	1.6
White Goods	0.0	0.0	0.0	0.0
Nonferrous Metals	0.4	0.0	0.0	0.0
<b>PAPER</b>				
Newsprint	1.5	0.7	0.0	1.1
Corrugated Containers	13.3	12.1	0.2	18.0
Computer Paper	5.8	1.0	0.1	3.8
Office Paper	8.2	2.9	0.5	1.6
Mixed Waste Paper	6.8	5.2	0.4	8.4
Nonrecyclable Paper	6.7	5.2	8.6	10.8
<b>PLASTICS</b>				
PET Bottles	0.0	2.1	0.0	0.0
HDPE Bottles	1.1	0.0	0.0	0.0
Plastic Packaging	3.6	4.1	0.1	1.4
Other Plastic Products	2.2	13.1	0.2	5.3
Expanded Polystyrene	1.5	16.9	0.0	0.4
<b>RUBBER</b>				
Rubber Products	0.1	1.9	0.2	0.1
Tires	0.2	0.0	0.0	0.0
<b>ORGANIC</b>				
Food	0.9	0.8	0.0	1.4
Lawn and Garden Waste	0.1	0.0	0.0	2.6
Wood Waste	10.2	0.9	0.2	2.2
<b>OTHER</b>				
Disposable Diapers	0.0	0.0	0.0	0.0
Textiles	0.1	0.1	0.1	1.6
Leather	0.0	0.0	51.4	0.0
Inert Material and Fines	18.8	0.4	37.7	12.5
Ash	0.0	0.0	0.0	0.0
Construction Debris (other than wood)	3.0	20.9	0.0	7.7
<b>HOUSEHOLD HAZARDOUS</b>				
Batteries	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0
Other Chemicals	4.1	0.5	0.0	0.0

TABLE IV-11-Continued  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 MANUFACTURING WASTE COMPOSITION BY SIC

<u>CATEGORIES</u>	<u>SIC CODES</u>			
	<u>330</u>	<u>340</u>	<u>350</u>	<u>360</u>
<b>GLASS</b>				
Nonrefillable Beer Bottles	0.0	0.0	0.0	0.2
Refillable Beer Bottles	0.0	0.0	0.0	0.0
Nonrefillable Soft Drink Bottles	0.0	0.1	0.0	0.0
Refillable Soft Drink Bottles	0.0	0.0	0.1	0.0
Container Glass	0.6	0.0	0.0	0.3
Nonrecyclable Glass	0.4	4.4	0.5	0.4
<b>METAL</b>				
Aluminum Cans	0.1	0.5	0.2	0.0
Aluminum Containers	0.1	0.8	0.0	0.2
Tin Cans	0.1	0.1	0.0	0.3
Bi-Metal Cans	0.0	0.0	0.0	0.0
Mixed Metals/Materials	0.6	1.1	1.0	3.8
Ferrous Metals	0.9	1.8	31.7	0.3
White Goods	0.0	0.0	0.0	0.0
Nonferrous Metals	0.0	0.0	0.0	0.3
<b>PAPER</b>				
Newsprint	0.6	2.1	0.4	0.9
Corrugated Containers	4.9	9.7	14.9	34.6
Computer Paper	1.4	5.6	2.2	6.0
Office Paper	0.9	1.5	10.2	11.4
Mixed Waste Paper	5.6	2.8	19.4	8.0
Nonrecyclable Paper	5.8	46.4	8.6	6.4
<b>PLASTICS</b>				
PET Bottles	0.0	0.0	0.0	0.0
HDPE Bottles	0.3	0.0	0.0	0.0
Plastic Packaging	7.3	1.8	1.5	7.0
Other Plastic Products	0.7	0.0	2.5	1.7
Expanded Polystyrene	2.7	0.9	0.3	0.8
<b>RUBBER</b>				
Rubber Products	7.0	0.0	0.0	0.3
Tires	0.1	0.0	0.0	0.0
<b>ORGANIC</b>				
Food	0.7	0.9	0.3	0.3
Lawn and Garden Waste	1.9	0.0	0.0	0.5
Wood Waste	30.7	18.3	2.7	12.8
<b>OTHER</b>				
Disposable Diapers	0.0	0.0	0.0	0.0
Textiles	0.6	0.2	0.3	0.3
Leather	0.6	0.4	0.0	0.0
Inert Material and Fines	23.6	0.3	3.0	0.2
Ash	0.0	0.0	0.0	0.0
Construction Debris (other than wood)	1.4	0.0	0.0	0.5
<b>HOUSEHOLD HAZARDOUS</b>				
Batteries	0.0	0.0	0.0	0.5
Oil	0.1	0.1	0.0	0.0
Other Chemicals	0.2	0.0	0.0	2.0

TABLE IV-11-Continued  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 MANUFACTURING WASTE COMPOSITION BY SIC

<u>CATEGORIES</u>	<u>SIC CODES</u>		
	<u>370</u>	<u>380</u>	<u>390</u>
<b>GLASS</b>			
Nonrefillable Beer Bottles	0.0	0.0	0.0
Refillable Beer Bottles	0.0	0.0	0.0
Nonrefillable Soft Drink Bottles	0.0	0.9	0.6
Refillable Soft Drink Bottles	0.0	0.0	0.0
Container Glass	0.7	0.3	0.3
Nonrecyclable Glass	0.4	2.9	1.6
<b>METAL</b>			
Aluminum Cans	0.4	0.6	0.0
Aluminum Containers	0.0	0.0	0.3
Tin Cans	0.0	0.7	0.0
Bi-Metal Cans	0.0	0.0	0.0
Mixed Metals/Materials	0.0	1.6	3.0
Ferrous Metals	7.3	2.1	0.1
White Goods	0.0	0.0	0.0
Nonferrous Metals	1.2	1.2	0.9
<b>PAPER</b>			
Newsprint	0.4	0.9	0.3
Corrugated Containers	15.0	23.0	8.6
Computer Paper	2.0	8.0	2.1
Office Paper	4.3	9.1	3.6
Mixed Waste Paper	34.0	20.3	7.3
Nonrecyclable Paper	1.7	10.9	9.3
<b>PLASTICS</b>			
PET Bottles	0.0	0.0	0.0
HDPE Bottles	1.3	0.7	0.3
Plastic Packaging	1.4	1.0	0.9
Other Plastic Products	13.1	2.0	19.8
Expanded Polystyrene	3.4	0.6	4.4
<b>RUBBER</b>			
Rubber Products	1.0	0.4	0.0
Tires	0.0	0.0	0.0
<b>ORGANIC</b>			
Food	1.4	1.0	0.6
Lawn and Garden Waste	0.4	0.1	0.3
Wood Waste	3.7	6.0	12.9
<b>OTHER</b>			
Disposable Diapers	0.0	0.0	0.0
Textiles	0.8	0.4	21.9
Leather	0.0	0.0	0.0
Inert Material and Fines	5.6	1.3	0.6
Ash	0.0	0.0	0.0
Construction Debris (other than wood)	0.0	3.9	0.3
<b>HOUSEHOLD HAZARDOUS</b>			
Batteries	0.0	0.0	0.0
Oil	0.0	0.0	0.0
Other Chemicals	0.6	0.0	0.0

6. SELF-HAUL WASTE STREAM

a. Methodology

A total of 268 samples were examined, 12 of which came from self-haul drop-boxes. Due to the limited contractual schedule, sampling was conducted from May to September. Thus, a higher percentage of lawn and garden waste may have been found than during a year long period. Vehicles from which the samples taken were selected based on anticipated daily traffic in order to provide approximately twelve samples per day distributed throughout a facility's normal hours of operation. The pool from which the samples were drawn consisted of all vehicles, whether hauling from a residence or a business, which were not associated with either a municipal or private refuse hauler. Self-haul sampling locations are listed below.

TABLE IV-12  
WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey-1987  
SELF-HAUL SAMPLING LOCATIONS

Aberdeen	Okanogan
Bellingham	Olympia
Centralia	Pierce County
Colville	Port Angeles
Ephrata	Spokane
Forks	Tacoma
Hoquiam	Vancouver
Kennewick	Walla Walla
King County	Wenatchee
Longview	Whitman County
Mount Vernon	Yakima

The sample size averaged 320 pounds. The category sorting and classification procedure was the same as that used for residential and commercial sampling. Approximately 70% of the samples drawn represented complete loads. If a selected vehicle contained substantially more than 300 pounds of garbage, then a representative 300-pound sample was separated from the load, weighed, and sorted. If a large load consisted of only one component, it was simply recorded as 300 pounds of that component. Weights of individual items which were too heavy or bulky for the scale were estimated.

b. Results

The results of the self-haul waste stream survey are displayed in Table IV-13.

TABLE IV-13  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 SELF-HAUL WASTE-STREAM SURVEY

<u>CATEGORIES</u>	<u>% BY WEIGHT</u>
<b>GLASS</b>	
Nonrefillable Beer Bottles	0.3
Refillable Beer Bottles	0.2
Nonrefillable Soft Drink Bottles	0.3
Refillable Soft Drink Bottles	0.0
Container Glass	1.5
Nonrecyclable Glass	0.6
<b>METAL</b>	
Aluminum Cans	0.2
Aluminum Containers	0.0
Tin Cans	0.6
Bi-Metal Cans	0.0
Mixed Metals/Materials	3.6
Ferrous Metals	4.8
White Goods	2.3
Nonferrous Metals	0.9
<b>PAPER</b>	
Newsprint	1.2
Corrugated Containers	3.5
Computer Paper	0.0
Office Paper	0.4
Mixed Waste Paper	3.2
Nonrecyclable Paper	1.8
<b>PLASTICS</b>	
PET Bottles	0.1
HDPE Bottles	0.1
Plastic Packaging	1.6
Other Plastic Products	1.2
Expanded Polystyrene	0.2
<b>RUBBER</b>	
Rubber Products	0.5
Tires	0.6
<b>ORGANIC</b>	
Food	3.4
Lawn and Garden Waste	30.9
Wood Waste	15.7
<b>OTHER</b>	
Disposable Diapers	0.2
Textiles	5.0
Leather	0.1
Inert Material and Fines	7.5
Ash	0.6
Construction Debris (other than wood)	5.9
<b>HOUSEHOLD HAZARDOUS</b>	
Batteries	0.4
Oil	0.1
Other Chemicals	0.7

7. HOUSEHOLD HAZARDOUS WASTE

Household hazardous wastes were grouped and sorted into the ten categories listed in Table IV-14 below. The amounts found in the residential waste stream indicate that these wastes account for only about .4 percent of total residential waste disposed. The self haul amounts totaled 1.2 percent of self haul disposed waste.

TABLE IV-14  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 COMPOSITION PERCENTAGES BY WEIGHT OF HOUSEHOLD HAZARDOUS WASTES

	Residential	Self Haul	Commercial	Manufacturing
Adhesives, Glues	.00%	.09%	.03%	1.70%
Paints, Solvents	.12	.31	.09	1.78
Cleaners	.02	.03	.01	.16
Pesticides	.01	.01	.02	.00
Batteries	.06	.40	.05	.01
Gasoline	.00	.00	.00	.00
Motor Oil, Diesel Oil	.16	.09	.06	.01
Asbestos	.00	.00	.00	.08
Explosives	.00	.00	.00	.00
Other Chemicals	.02	.29	.06	.00
<b>SUBSTREAM TOTALS</b>	<b>39%</b>	<b>1.22%</b>	<b>.32%</b>	<b>3.74%</b>



3. Our last question: Would you be willing to allow our team to look into your dumpster(s) for a quick visual analysis within the next month?

( ) yes  
( ) no

NOTE: If you prefer to mail this, please do so by August 30, 1988 to:

Matrix Management Group  
811 1st Avenue, Suite 466  
Seattle, Washington 98104

Phone \_\_\_\_\_

Person who completed form: \_\_\_\_\_

Thank you!

ATTACHMENT I

SAMPLE CATEGORIES:

% by weight

- PAPER:     \_\_\_ Newspaper  
          \_\_\_ Corrugated paper  
          \_\_\_ Computer paper  
          \_\_\_ Office paper (high grade 8 1/2 x 11, legal and ledger)  
          \_\_\_ Mixed scrap paper (potentially recyclable)  
          \_\_\_ Nonrecyclable paper and mixed material paper products (e.g. plastic-coated, paper and metal cans, paper milk cartons)  
          \_\_\_ Disposable diapers
- PLASTICS: \_\_\_ PET bottles (primarily 2 liter pop bottles)  
          \_\_\_ Plastic milk/juice containers  
          \_\_\_ Styrofoam  
          \_\_\_ Nonrecyclable plastic packaging  
          \_\_\_ Other plastic products (used/broken toys, radios, car parts, etc.)
- GLASS:     \_\_\_ Nonrefillable beer bottles  
          \_\_\_ Refillable beer bottles  
          \_\_\_ Nonrefillable soft drink bottles  
          \_\_\_ Refillable soft drink bottles  
          \_\_\_ Container glass  
          \_\_\_ Nonrecyclable glass (light bulbs, kitchen ware, window glass, etc.)

% by weight

METALS:    \_\_\_ Aluminum beverage cans  
          \_\_\_ Aluminum food containers  
          \_\_\_ Tin cans  
          \_\_\_ Bi-metal cans  
          \_\_\_ Ferrous metals  
          \_\_\_ White goods (large appliances such as stove,  
              refrigerator or washer)  
          \_\_\_ Non-ferrous metals  
          \_\_\_ Mixed metals and other materials

RUBBER:    \_\_\_ Rubber products (other than tires)  
          \_\_\_ Tires

ORGANIC:   \_\_\_ Food  
          \_\_\_ Yard and garden waste

OTHER:     \_\_\_ Wood  
          \_\_\_ Textiles  
          \_\_\_ Leather  
          \_\_\_ Ash  
          \_\_\_ Ceramics, porcelain, china  
          \_\_\_ Rock, concrete, bricks  
          \_\_\_ Sand, soil, dirt, etc.  
          \_\_\_ Gypsum drywall

OTHER (CONTINUED)

% by weight

- \_\_\_ Fiberglass insulation
- \_\_\_ Construction debris, other than wood, concrete or bricks

HAZARDOUS SUBSTANCES (excluding spent or empty containers):

- \_\_\_ Latex paint products
- \_\_\_ Adhesives, glues, cements, sealants, caulking
- \_\_\_ Solvents, thinners, paint removers and strippers, oil-based paints
- \_\_\_ Cleaners
- \_\_\_ Pesticides
- \_\_\_ Batteries
- \_\_\_ Gasoline
- \_\_\_ Motor oil, diesel oil
- \_\_\_ Asbestos
- \_\_\_ Explosives
- \_\_\_ Other chemicals  
Specify:

\_\_\_ Total  
100%

## SECTION V

### CURRENT RECYCLING LEVELS

#### 1. PURPOSE

This section discusses the results of the analysis of Waste Generation Area recycling rates. Recycling information is presented for twenty categories of materials:

- Refillable beer bottles
- Refillable soft drink bottles
- Container glass
- Newsprint
- Corrugated containers
- Computer paper
- Office paper
- Mixed waste paper
- Aluminum cans
- Aluminum containers
- Tin cans
- Bi-metal cans
- Ferrous metals
- Nonferrous metals
- White goods
- Batteries
- Tires
- PET bottles
- HDPE bottles
- Oil

#### 2. APPROACH

The analysis involved the following steps:

- Establishment of a Statewide network detailing the movement of recycled materials from recyclers to processors/end-users.
- Mailing of forms to approximately 450 recyclers and processors/end-users to request information regarding tonnages of Washington State recycled materials handled in 1987, the WGA origins of the materials, and their destinations.
- Telephoning of recyclers or processors/end-users whose data were unclear or incomplete.

- Compilation of information received and the deletion of tonnages reported as sold to other study participants (this eliminated the double-counting of materials).
- Identification of recyclers or processors/end-users who either (1) changed the form of any material ("processor/end-user"), or (2) sent any material out of the area ("exporter"), and whether they did it for all materials handled or just for some.
- Determination of the WGA origins of these end-used and exported materials.
- Double-checking and adjustment of data (when needed) if materials were calculated as not being recycled at all from a particular WGA.
- Summarization of results.

This section discusses each of the above steps and the results of the analysis.

### 3. METHODOLOGY

#### a. Definition of State Recyclable Materials Networks

The purpose of this task was to assign the area recyclers and processors/end-users to their respective WGAs and to detail who sent what materials to whom. With this information, double-counting of materials was eliminated, both at the WGA level and at the State level.

The names of area recyclers came from:

- the January, 1988 list of Recycling Centers in Washington State, published by the Washington Department of Ecology Office of Waste Reduction and Recycling;
- additional recyclers identified in the 1987 Statewide recyclers survey, completed earlier by the Gilmore Research Group;
- lists of handlers of special materials such as tires and batteries as provided by WDOE and industry representatives.

Businesses were assigned to WGAs according to the city in which their major collection point was located. Larger recyclers or processors/end-users who had several major collection points were assigned multiple and distinct WGA designations, if necessary. In such cases, the affected businesses were referred to in the data request forms by both business name and location (e.g., Independent Paper Stock--Tacoma ). Known multiple locations were contacted separately to find out whether all their recycled materials went to another

company location in the same WGA. If it did, then only the up-line recycler was considered in this study.

Out-of-state recyclers and processors/end-users identified through earlier studies as handling Washington State recycled materials were also included in this study. These businesses--located in Oregon, Idaho, and British Columbia (Canada)--were not assigned a WGA designation, and they were considered end-users.

Previously collected data on (1) the materials that each recycler or processor/end-user handled in 1987, and (2) the businesses who received each material were compiled onto a computer database. This allowed for easier identification of businesses selling to processors/end-users or exporters.

b. Collection of WGA Recycling Data

Forms were devised to gather information from recyclers and processors/end-users about their handling of recyclable materials from Washington State (These are attached at the end of this section). The information requested included:

- the amount of materials received by their firms in 1987 from within the State of Washington;
- the percentage of each material that came from each WGA (maps were provided); and
- the percentage of each material sold to a given list of recyclers and processors/end-users located within the same WGA.

These forms, along with an explanatory cover letter and a return envelope, were mailed during early August, 1988 to approximately 450 businesses. By September 20, about 35% of the forms had been returned to the Gilmore Research Group offices.

From September 20 through September 29, telephone calls were made to firms whose data were unclear or incomplete. Through this effort, information was completed for approximately 90% of those surveyed. The remainder either could not be reached after multiple attempts or declined to give information about their operations. Some of these expressed reluctance to divulge what they considered to be proprietary information; others said that the process of compiling such data would be too time-consuming. For most of the materials covered in the study, these omissions were not crucial; they involved either small operations or companies whose recyclables were sold to other participants. However, the lack of data from a number of major handlers of ferrous and nonferrous scrap metal caused the reported figures for these two materials to be considerably lower than they would be with 100% participation. Because of these data omissions, amounts reported as sold to companies who declined comment were later included; this helped make up some of the known shortfall.

All participants who sent recycled materials out of their own WGAs were asked to estimate how much of these materials, if any, was sold to other study participants. This procedure eliminated double-counting of amounts at the State level. It also provided a net value for State recycling by material, a figure which could be matched against the sum of the net WGA totals, to check for discrepancies.

The collected data were compiled, checked for completeness, and entered into an interactive database at the computing facilities of the Gilmore Research Group. Material amounts were identified for which some portion was either (1) sent to regions outside the study area, (2) processed into a different form, or (3) sent to firms who declined information. For the purposes of this study, these amounts were considered end-user amounts, since they included no double-counted tonnages. The computer summed these end-user amounts and assigned them to the WGAs where they originated, according to the end-users' information.

These calculations resulted in the end-users' version of where Washington State recycled materials came from within the State in 1987. For materials that appeared not to be represented in a WGA, checking was done to ensure that smaller amounts had not been overlooked by the larger processors/end-users. For example, a large end-user of computer paper may not have received even one percent of its recycled material from the Northeast WGA. However, a search of records among recyclers in the Northeast WGA may have revealed one hundred tons collected. This amount might not constitute 1% of the large end-user's collected materials and thus was not reported. In these cases, some mention of these tonnages was made in this report, even if it did not amount to 1% of the total Washington tonnages. Thus, amounts are shown as zero (0) here only when there is no reported evidence of the material being handled within a certain WGA.

#### 4. RESULTS

##### a. Estimates of Recycled Amounts by WGA

The calculations described in the previous paragraphs resulted in the figures shown on Tables V-1 and -2. All figures have been converted to short tons (2,000 pounds) and rounded to the nearest hundred tons. These estimates should be regarded as such, since they represent the "best guess" of the participating companies.

Table V-3 shows the percentage of each recycled material that originated in the various WGAs. Figure V-1 compares the total tons reported recycled in each WGA to what would be expected on a purely population basis. Table V-4 displays the expected tonnages by material based on each WGA's proportionate share of the State's population.

TABLE V-1  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 WASHINGTON STATE RECYCLED MATERIALS - 1987

(Adjusted for double-counting)

<u>Component</u>	<u>Weight (tons)</u>
Refillable beer bottles	19,000 <sup>1</sup>
Refillable soft drink bottles	1,700 <sup>2</sup>
Container glass	22,300
Newsprint	166,600
Corrugated containers	287,600
Computer paper	16,100
Office paper	32,900
Mixed waste paper	34,100
Aluminum cans	10,800
Aluminum containers	0
Tin cans	800
Bi-metal cans	0
Ferrous metals	423,800 <sup>3,4</sup>
Nonferrous metals	46,600 <sup>4</sup>
White goods	24,800 <sup>4</sup>
Batteries	22,100
Tires	10,300
PET bottles	0
Other plastic products	1,700
Oil	<u>56,200<sup>5</sup></u>
TOTAL	<u><u>1,177,400</u></u>

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<sup>1</sup>Equivalent to 2,748,158 cases of twenty-four bottles.

<sup>2</sup>Equivalent to 152,100 cases of twenty-four bottles.

<sup>3</sup>All recovered Ferrous metals including automobile hulks.

<sup>4</sup>Tonnages shown are lower than actual, due to underreporting.

<sup>5</sup>Equivalent to 244,439 barrels.

TABLE V-2  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 WASHINGTON STATE RECYCLED MATERIALS - 1987  
 - Estimated Tons by Waste Generation Areas (WGA) -  
 WGA Estimates\*\*

	WEST	NORTH- WEST	PUGET SOUND	SOUTH- WEST	NORTH CENTRAL	SOUTH CENTRAL	NORTH- EAST	SOUTH- EAST
Refillable beer bottles	900	1,100	12,000	1,000	1,100	1,100	1,000	800
Refillable soft drink bottles	0	0	700	<100	300	300	<100	400
Container glass	600	400	15,400	1,200	100	900	1,500	2,200
Newsprint	2,500	2,800	127,900	7,500	1,600	8,800	14,100	1,400
Corrugated containers	2,500	2,800	235,900	7,000	2,100	7,300	23,300	6,700
Computer paper	<100	100	14,400	1,200	0	<100	200	200
Office paper	0	200	30,500	900	0	100	1,100	100
Mixed waste paper	0	200	28,900	3,500	0	0	1,400	100
Aluminum cans	300	700	3,700	600	400	700	2,900	1,500
Aluminum containers	<100	<100	<100	<100	<100	<100	<100	<100
Tin cans	<100	100	500	<100	0	<100	<100	200
Bi-metal cans	0	0	0	0	0	0	0	0
Ferrous metals*	9,200	34,000	243,200	62,400	14,700	19,000	26,700	14,600
Nonferrous metals*	1,000	800	33,300	1,500	600	3,000	3,700	2,700
White goods	100	200	24,300	<100	0	0	100	100
Batteries	300	1,500	15,000	1,800	400	900	1,500	700
Tires	0	<100	7,500	500	0	100	2,000	200
PET bottles	0	0	0	0	0	0	0	0
Other plastic products	0	0	<100	1,700	0	0	0	0
Oil	1,200	800	39,500	7,500	500	1,200	2,800	2,700
<b>TOTALS BY WGA:</b>	<b>18,600</b>	<b>45,700</b>	<b>832,700</b>	<b>98,300</b>	<b>21,800</b>	<b>43,400</b>	<b>82,300</b>	<b>34,600</b>

\* Tonmages shown are lower than actual, due to underreporting, but include all recoverable materials.  
 \*\* Rounded to the nearest hundred tons.

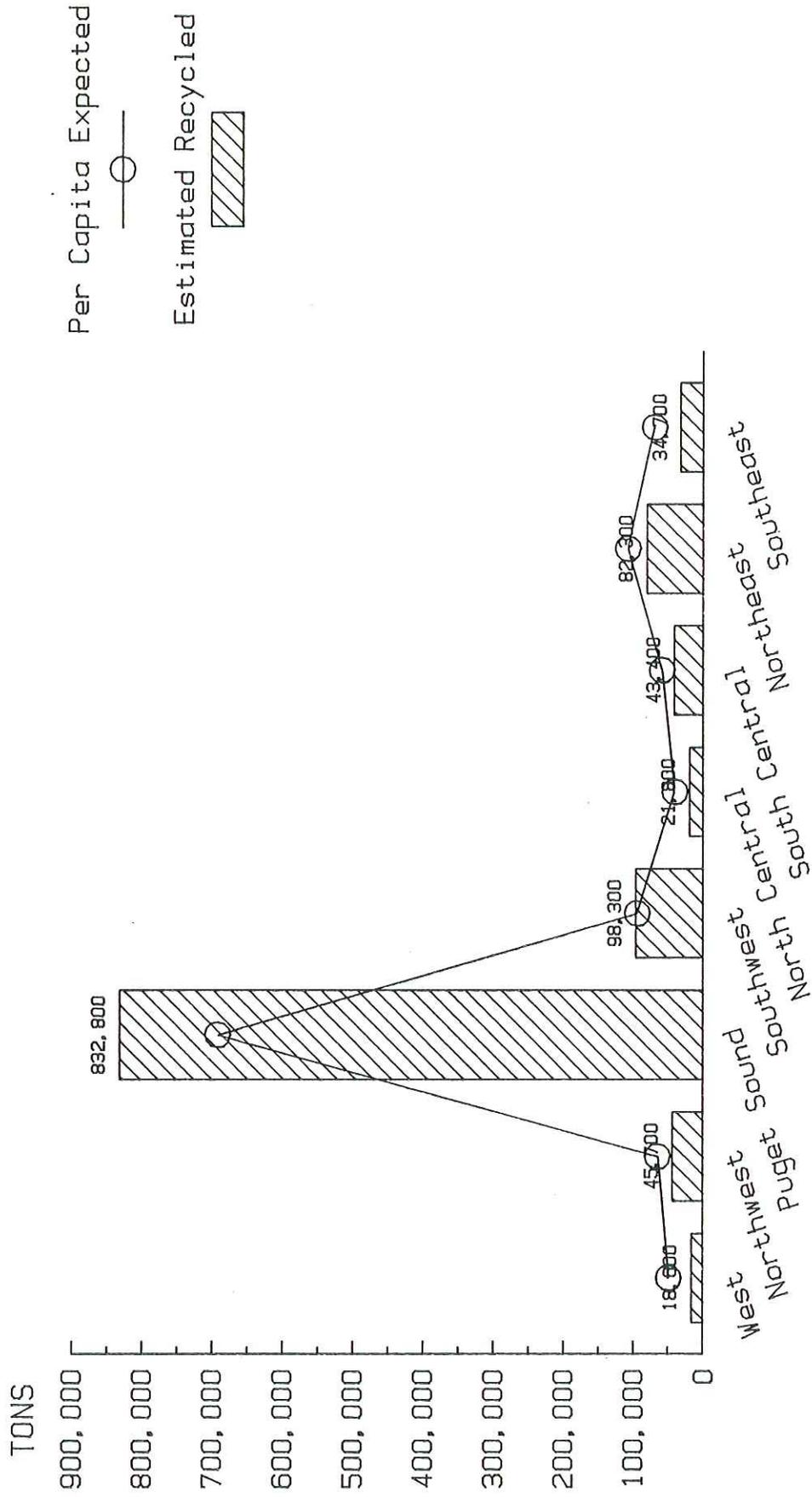
TABLE V-3  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 WASHINGTON STATE RECYCLED MATERIALS - 1987  
 -Percent Material Recycling by WGA -

	WEST	NORTH- WEST	PUGET SOUND	SOUTH- WEST	NORTH CENTRAL	SOUTH CENTRAL	NORTH- EAST	SOUTH- EAST	
Refillable beer bottles	5%	6%	63%	5%	6%	6%	5%	4%	100%
Refillable soft drink bottles	0	0	39	<1	20	15	1	25	100%
Container glass	3	2	69	5	<1	4	7	10	100%
Newsprint	1%	2%	77%	5%	1%	5%	8%	1%	100%
Corrugated containers	1	1	82	2	1	3	8	2	100%
Computer paper	<1	1	89	7	0	<1	1	1	100%
Office paper	0	1	92	3	0	<1	3	<1	100%
Mixed waste paper	0	<1	85	10	0	0	4	<1	100%
Aluminum cans	3%	6%	34%	5%	4%	7%	27%	14%	100%
Aluminum containers	<1	1	40	9	10	11	3	26	100%
Tin cans	1	9	60	3	0	1	5	21	100%
Bi-metal cans	--	--	--	--	--	--	--	--	100%
Ferrous metals	2	8	57	15	4	5	6	3	100%
Nonferrous metals	2	2	71	3	1	7	8	6	100%
White goods	<1	1	98	<1	0	0	<1	<1	100%
Batteries	1%	7%	68%	8%	2%	4%	7%	3%	100%
Tires	0	<1	72	5	0	1	19	2	100%
PET bottles	--	--	--	--	--	--	--	--	100%
Other plastic products	0	0	<1	100	0	0	0	0	100%
Oil	2%	2%	70%	13%	1%	2%	5%	5%	100%

Figure V-1

# WASHINGTON STATE RECYCLED MATERIALS - 1987

## Estimated Total Tons Recycled By WGA



WASTE GENERATION AREAS

TABLE V-4  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 WASHINGTON STATE RECYCLED MATERIALS - 1987

- Expected Tonnages\*\* -  
 Based on WGA Population in Proportion to State Population

	<u>WEST</u>	<u>NORTH- WEST</u>	<u>PUGET SOUND</u>	<u>SOUTH- WEST</u>	<u>NORTH CENTRAL</u>	<u>SOUTH CENTRAL</u>	<u>NORTH- EAST</u>	<u>SOUTH- EAST</u>
Refillable beer bottles	800	1,100	11,200	1,500	700	1,000	1,700	1,100
Refillable soft drink bottles	100	100	1,200	200	100	100	200	100
Container glass	900	1,200	12,900	1,800	800	1,100	2,000	1,300
Newsprint	7,000	9,200	98,000	13,300	5,800	8,400	15,300	9,900
Corrugated containers	12,100	16,000	169,000	23,000	10,000	14,500	26,400	17,000
Computer paper	700	900	9,400	1,300	600	800	1,500	900
Office paper	1,400	1,800	19,400	2,600	1,100	1,700	3,000	2,000
Mixed waste paper	1,400	1,900	20,000	2,700	1,200	1,700	3,100	2,000
Aluminum cans	500	700	6,500	900	400	600	1,000	700
Aluminum containers	<100	<100	100	<100	<100	<100	<100	<100
Tin cans	<100	100	600	100	<100	<100	100	100
Bi-metal cans	--	--	--	--	--	--	--	--
Ferrous metals*	17,800	23,400	248,900	33,800	14,800	21,400	38,900	25,100
Nonferrous metals*	2,000	2,600	27,600	3,800	1,600	2,400	4,300	2,800
White goods*	1,000	1,400	14,700	2,000	700	1,300	2,300	1,500
Batteries	900	1,200	13,000	1,800	800	1,100	2,000	1,300
Tires	300	400	4,700	600	300	400	700	500
PET bottles	--	--	--	--	--	--	--	--
Other plastic products	100	100	1,000	100	100	100	200	100
Oil	2,400	3,100	33,000	4,500	2,000	2,800	5,200	3,300
<b>TOTALS BY WGA:</b>	<u>49,400</u>	<u>65,200</u>	<u>691,200</u>	<u>94,000</u>	<u>41,000</u>	<u>59,400</u>	<u>107,900</u>	<u>69,700</u>

\* Tonnages shown are lower than actual, due to underreporting, but include all recoverable materials.  
 \*\* Rounded to the nearest hundred tons.

## GILMORE RESEARCH GROUP

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METROPOLITAN PARK BUILDING 1100 OLIVE WAY, SUITE 250 SEATTLE, WASHINGTON 98101 (206) 547-5555

To: Recyclable Materials Handlers  
From: Gilmore Research Group  
Re: Washington State Recycling Study

The 1988 State Legislature passed Substitute House Bill 1684, requiring the Department of Ecology to carry out a best management practices analysis of solid waste, to determine how these materials should be handled. The Legislature also asked that these best management practices be drawn up for sub-state areas called "Waste Generation Areas" (WGAs).

We at Matrix Management Group and Gilmore Research Group have been contracted by the Washington Department of Ecology to come up with the recycling rates in each of these areas. As a recycler or broker of recycled material, your cooperation is essential to the success of this effort.

The accompanying material describes the level of participation needed. Please note that the data are being collected and analyzed by Matrix and Gilmore. Only aggregated data will be reported and at no time will any one company's response be identified. The information is guaranteed confidential.

As part of this work, we already have projects in place to measure the levels of recyclables going into the waste stream, as well as levels of recyclables not being recovered. With your help, the state can measure the amount of materials actually being recycled.

If you have any questions or if you would like to know more about the study, please call Jay Shepard of the Washington Department of Ecology at (206) 459-6302 or Gene Patterson of Gilmore at (206) 547-5555. Thank you for your time and information; the results of this study will be very important for the future of recycling in the state of Washington.

JoElla M. Weybright, Senior Vice President  
Gene Patterson, Project Director

Enclosures

GP/tsdr1

RECORDING FORM - 1987 WGA SURVEY

CODE # \_\_\_\_\_

Please fill in below the percentage of materials handled by your firm in 1987 that came from each Waste Generation Area (WGA). [Refer to List/Map]. If you did not handle any material from a certain WGA, then write a "zero" in the corresponding blank.

AMOUNT\* FROM WASHINGTON SOURCES  
(TON = 2,000 LBS.)

\*If units used are other than shown below, please cross out what is shown and write in your units.

MATERIAL	Waste Generation Areas							
	WEST	NORTH-WEST	PUGET SOUND	SOUTH-WEST	NORTH-CENTRAL	SOUTH-CENTRAL	NORTH-EAST	SOUTH-EAST
Refillable beer bottles	___%	___%	___%	___%	___%	___%	___%	___%
Refillable soft-drink bottles	___%	___%	___%	___%	___%	___%	___%	___%
All other glass containers or cullet glass	___%	___%	___%	___%	___%	___%	___%	___%
Newspapers	___%	___%	___%	___%	___%	___%	___%	___%
Corrugated paper (includes cardboard, brown bags, chip board)	___%	___%	___%	___%	___%	___%	___%	___%
Computer paper	___%	___%	___%	___%	___%	___%	___%	___%
White and colored office or ledger paper	___%	___%	___%	___%	___%	___%	___%	___%
Any other scrap paper or magazines not noted above	___%	___%	___%	___%	___%	___%	___%	___%
Aluminum cans	___%	___%	___%	___%	___%	___%	___%	___%
Aluminum food containers or foil	___%	___%	___%	___%	___%	___%	___%	___%
Tinned cans	___%	___%	___%	___%	___%	___%	___%	___%
Bi-metal cans	___%	___%	___%	___%	___%	___%	___%	___%
Ferrous metals (steel, iron, stainless steel)	___%	___%	___%	___%	___%	___%	___%	___%
Nonferrous metals (all else EXCEPT aluminum cans, foil, and food containers, as noted above)	___%	___%	___%	___%	___%	___%	___%	___%
Appliances/White goods	___%	___%	___%	___%	___%	___%	___%	___%
Batteries (auto or other lead-acid types)	___%	___%	___%	___%	___%	___%	___%	___%
Tires	___%	___%	___%	___%	___%	___%	___%	___%
PET beverage bottles	___%	___%	___%	___%	___%	___%	___%	___%
Any other recyclable plastic	___%	___%	___%	___%	___%	___%	___%	___%

PLEASE RETURN IN ENCLOSED, STAMPED ENVELOPE. THANK YOU FOR YOUR HELP.

THE COMPANIES NAMED BELOW ARE LOCATED WITHIN YOUR WGA AND ARE ALSO PARTICIPATING IN OUR STUDY. IN ORDER TO AVOID DOUBLE-COUNTING MATERIALS THAT YOUR COMPANY MAY HAVE SOLD TO THEM, PLEASE ESTIMATE THE PERCENTAGE OF YOUR MATERIAL(S) THAT WERE SOLD TO ANY ONE OR COMBINATION OF THESE COMPANIES.

OF THE TOTAL RECYCLABLE MATERIALS HANDLED BY YOUR COMPANY IN 1987:

- |   |  |
|---|--|
| _____ % of the refillable<br>beer bottles               | _____ % of the aluminum cans                       |
| _____ % of the glass containers<br>or cullet            | _____ % of the aluminum food<br>containers or foil |
| _____ % of the newspaper                                | _____ % of the ferrous metals                      |
| _____ % of the corrugated paper                         | _____ % of the nonferrous metals                   |
| _____ % of the computer paper                           | _____ % of the appliances or<br>white goods        |
| _____ % of the white/colored<br>office and ledger paper | _____ % of the batteries                           |
| _____ % of the scrap paper<br>and magazines             | _____ % of the tires                               |
|   | _____ % of the recyclable plastic                  |

WAS SOLD TO (ONE OR ANY COMBINATION):

- |                              |                                     |
|------------------------------|-------------------------------------|
| A.W.E. Recycling             | Independent Paper Stock - Vancouver |
| Alcoa Recycling Company      | Koppe Metals                        |
| Calou Recycling              | Longview Ice                        |
| Conrad Industries            | Partek Corporation                  |
| E.Z. Recycling               | Reynolds Aluminum Reduction Plant   |
| English Pit Transfer Station | Tire Recyclers                      |
| Floyd's Recycling            | Vulture Recycling                   |
| Hub City Recycling           | Waste Control Recycling             |

Please return in enclosed, stamped envelope. Thank you for your help.

## SECTION VI

### WGA WASTE GENERATION AND COMPOSITION

#### 1. PURPOSE

Section VI summarizes total waste generation in each of the Waste Generation Areas (WGAs). Amounts of waste disposed and recycled for each category of the waste stream are presented. Quantities of waste which are disposed are also provided by generator type including residential, commercial/institutional, manufacturing, and self-hauled materials. This data is summarized in graphs and pie charts for each WGA on the following pages. Data is present in the following order:

- Statewide
- West Waste Generation Area
- Northwest Waste Generation Area
- Puget Sound Waste Generation Area
- Southwest Waste Generation Area
- North Central Waste Generation Area
- South Central Waste Generation Area
- Northeast Waste Generation Area
- Southeast Waste Generation Area

#### 2. APPROACH

To compile the raw data gathered from the three surveys conducted (manufacturers, counties, and haulers) as well as from the waste-stream sampling efforts, a series of spreadsheets was developed. These spreadsheets contain the tonnage of waste disposed by each generator type and the percentages of each waste category in these waste substreams.

Data from each waste-substream analysis appears in table form on the following pages. For each WGA, there is a residential, commercial, manufacturing, and self-haul table as well as a waste generation summary table which estimates the number of tons for each waste category (e.g., newspaper) and the percentage of the waste stream represented by each. A summary table for the entire waste stream is also provided for each WGA. This includes total disposed tons, recycled tons and generated tons (disposed plus recycled tons) and relative percentages.

##### a. Residential

The figure for tons disposed by residential generators was derived from the hauler survey. This number was then applied to the residential composition percentage determined through sampling for each category of the solid-waste stream. An estimated category tonnage was then calculated by applying statewide composition data to generated amounts in each WGA.

b. Commercial and Manufacturing

Independently calculated waste-generation rates (see Sections IV-4 and -5) were used to determine the relative proportion of waste being disposed in the municipal waste stream by commercial and manufacturing establishments. Further, SIC generation rates were used to allocate an appropriate proportion of the commercial and manufacturing waste substreams to each of the seven commercial SIC categories (see page 51) and the twenty manufacturing categories (see page 58). These tonnages of commercial and manufacturing waste were then broken out by waste-stream category percentages and tons based on SIC specific sampling data.

Agricultural waste does not appear in aggregate form in these tables since it represented less than 100 tons of the municipal solid-waste stream, except in the South Central area, where it was significantly higher, reported to be approximately 24,259 tons per year.

The construction industry was not included in this analysis since it was not possible to derive generation rates. Construction waste quantities, as reported in the hauler survey, were however included in summary tables.

c. Self-Haul

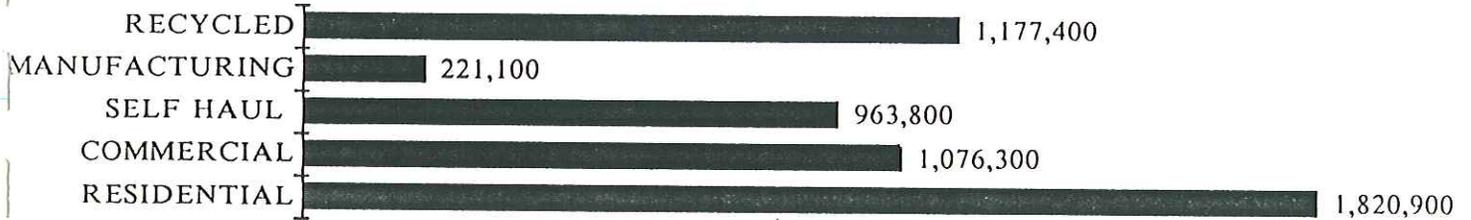
The total number of tons disposed for each waste-stream category by non-licensed haulers or private citizens was determined by applying the total tons estimated to have been self-hauled per WGA based on our surveys to the percentages for each category of this waste substream derived from statewide sampling of self-hauled waste.

FIGURE VI-1

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey-1987  
State of Washington

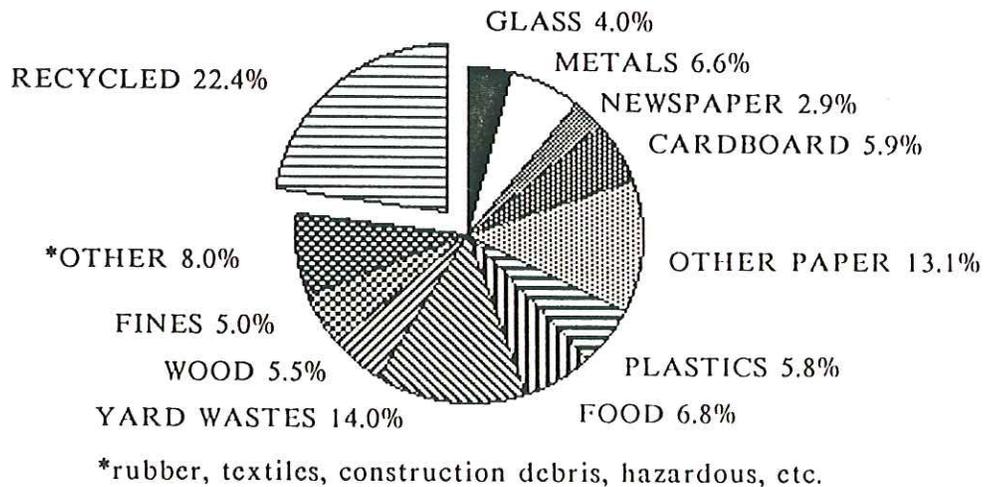
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 5,259,500



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-1

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey-1987**  
State of Washington  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	35,960	0.9	Note 2		Note 2	N/A
Refillable Beer Bottles	9,467	0.2	19,000	66.7	28,467	0.5
Nonrefillable Soft Drink Bottles	26,864	0.7	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	24	0.0	1,700	98.6	1,724	0.0
Container Glass	111,763	2.7	22,300	11.2	198,887	3.7
Nonrecyclable Glass	28,470	0.7			28,470	0.5
<b>METAL</b>						
Aluminum Cans	21,042	0.5	10,800	33.9	31,842	0.6
Aluminum Containers	5,718	0.1	0	0.0	5,718	0.1
Tin Cans	61,175	1.5	800	1.3	61,975	1.2
Bi-Metal Cans	24	0.0	0	0.0	24	0.0
Mixed Metals/Materials	81,006	2.0			81,006	1.5
Ferrous Metals	142,288	3.5	423,800	74.9	566,088	10.8
White Goods	23,986	0.6	24,800	50.8	48,786	0.9
Nonferrous Metals	13,344	0.3	46,600	77.7	59,944	1.1
<b>PAPER</b>						
Newsprint	153,416	3.8	166,600	52.1	320,016	6.1
Corrugated Containers	311,227	7.6	287,600	48.0	598,827	11.4
Computer Paper	20,884	0.5	16,100	43.5	36,984	0.7
Office Paper	36,333	0.9	32,900	47.5	69,233	1.3
Mixed Waste Paper	425,194	10.4	34,100	7.4	459,294	8.7
Nonrecyclable Paper	208,006	5.1			208,006	4.0
<b>PLASTICS</b>						
PET Bottles	9,233	0.2	0	0.0	9,233	0.2
HDPE Bottles	11,687	0.3	1,700	12.7	13,387	0.3
Plastic Packaging	192,196	4.7			192,196	3.7
Other Plastic Products	65,386	1.6			65,386	1.2
Expanded Polystyrene	24,823	0.6			24,823	0.5
<b>RUBBER</b>						
Rubber Products	37,930	0.9			37,930	0.7
Tires	33,957	0.8	10,300	23.3	44,257	0.8
<b>ORGANIC</b>						
Food	357,604	8.8			357,604	6.8
Lawn and Garden Waste	735,022	18.0			735,022	14.0
Wood Waste	288,576	7.1			288,576	5.5
<b>OTHER</b>						
Disposable Diapers	61,497	1.5			61,497	1.2
Textiles	144,991	3.6			144,991	2.8
Leather	5,106	0.1			5,106	0.1
Inert Material and Fines	260,600	6.4			260,600	5.0
Ash	17,720	0.4			17,720	0.3
Construction Debris (other than wood)	89,532	2.2			89,532	1.7
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	6,261	0.2	22,100	77.9	28,361	0.5
Oil	5,119	0.1	56,200	91.7	61,319	1.2
Other Chemicals	18,682	0.5			18,682	0.4
<b>Total</b>	<b>4,082,113</b>		<b>1,177,400</b>		<b>5,259,513</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

**TABLE VI-2**  
**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey-1987**  
State of Washington  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	21,827	1.2
Refillable Beer Bottles	5,45	0.3
Nonrefillable Soft Drink Bottles	16,370	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	83,669	4.6
Nonrecyclable Glass	3,638	0.2
<b>METAL</b>		
Aluminum Cans	14,551	0.8
Aluminum Containers	3,638	0.2
Tin Cans	45,472	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	14,551	0.8
Ferrous Metals	10,913	0.6
White Goods	1,819	0.1
Nonferrous Metals	1,819	0.1
<b>PAPER</b>		
Newsprint	103,676	5.7
Corrugated Containers	87,307	4.8
Computer Paper	1,819	0.1
Office Paper	5,457	0.3
Mixed Waste Paper	254,644	14.0
Nonrecyclable Paper	101,858	5.6
<b>PLASTICS</b>		
PET Bottles	7,276	0.4
HDPE Bottles	9,094	0.5
Plastic Packaging	107,314	5.9
Other Plastic Products	14,551	0.8
Expanded Polystyrene	7,276	0.4
<b>RUBBER</b>		
Rubber Products	5,457	0.3
Tires	9,094	0.5
<b>ORGANIC</b>		
Food	198,258	10.9
Lawn and Garden Waste	405,611	22.3
Wood Waste	21,827	1.2
<b>OTHER</b>		
Disposable Diapers	58,204	3.2
Textiles	56,385	3.1
Leather	3,638	0.2
Inert Material and Fines	118,228	6.5
Ash	1,819	0.1
Construction Debris (other than wood)	10,913	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	1,819	0.1
Oil	3,638	0.2
Other Chemicals	1,819	0.1
<b>Total</b>	<b>1,820,704</b>	

TABLE VI-3  
**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey-1987**  
State of Washington  
**Commercial/Institutional Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	7,505	0.7
Refillable Beer Bottles	2,002	0.2
Nonrefillable Soft Drink Bottles	7,415	0.7
Refillable Soft Drink Bottles	22	0.0
Container Glass	12,979	1.3
Nonrecyclable Glass	16,639	1.6
<b>METAL</b>		
Aluminum Cans	4,012	0.4
Aluminum Containers	1,869	0.2
Tin Cans	9,572	0.9
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	30,951	3.0
Ferrous Metals	74,880	7.2
White Goods	0	0.0
Nonferrous Metals	2,112	0.2
<b>PAPER</b>		
Newsprint	36,170	3.5
Corrugated Containers	162,303	15.7
Computer Paper	13,634	1.3
Office Paper	19,384	1.9
Mixed Waste Paper	116,394	11.3
Nonrecyclable Paper	73,664	7.1
<b>PLASTICS</b>		
PET Bottles	849	0.1
HDPE Bottles	186	0.0
Plastic Packaging	62,319	6.0
Other Plastic Products	22,879	2.2
Expanded Polystyrene	11,476	1.1
<b>RUBBER</b>		
Rubber Products	24,693	2.4
Tires	19,018	1.8
<b>ORGANIC</b>		
Food	120,888	11.7
Lawn and Garden Waste	30,371	2.9
Wood Waste	76,307	7.4
<b>OTHER</b>		
Disposable Diapers	1,368	0.1
Textiles	36,638	3.5
Leather	113	0.0
Inert Material and Fines	19,943	1.9
Ash	347	0.0
Construction Debris (other than wood)	12,566	1.2
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	567	0.1
Oil	496	0.0
Other Chemicals	1,799	0.2
Total	1,034,330	

TABLE VI-4

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey-1987**  
State of Washington  
**Manufacturing Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	3,702	1.7
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	109	0.0
Refillable Soft Drink Bottles	2	0.0
Container Glass	564	0.3
Nonrecyclable Glass	2,421	1.1
<b>METAL</b>		
Aluminum Cans	513	0.2
Aluminum Containers	170	0.1
Tin Cans	357	0.2
Bi-Metal Cans	24	0.0
Mixed Metals/Materials	832	0.4
Ferrous Metals	8,129	3.7
White Goods	0	0.0
Nonferrous Metals	671	0.3
<b>PAPER</b>		
Newsprint	1,647	0.7
Corrugated Containers	25,637	11.6
Computer Paper	5,390	2.4
Office Paper	7,637	3.5
Mixed Waste Paper	21,899	9.9
Nonrecyclable Paper	14,287	6.5
<b>PLASTICS</b>		
PET Bottles	146	0.1
HDPE Bottles	1,443	0.7
Plastic Packaging	5,450	2.5
Other Plastic Products	16,088	7.3
Expanded Polystyrene	3,811	1.7
<b>RUBBER</b>		
Rubber Products	2,719	1.2
Tires	72	0.0
<b>ORGANIC</b>		
Food	5,751	2.6
Lawn and Garden Waste	1,800	0.8
Wood Waste	25,711	11.6
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	3,409	1.5
Leather	394	0.2
Inert Material and Fines	38,847	17.6
Ash	9,783	4.4
Construction Debris (other than wood)	3,452	1.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	26	0.0
Oil	24	0.0
Other Chemicals	8,203	3.7
Total	221,121	

TABLE VI-5

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
State of Washington  
 Self-haul Waste Stream

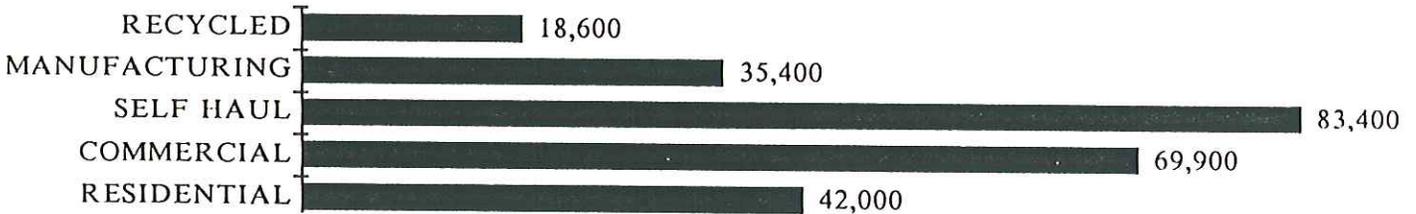
CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	2,886	0.3
Refillable Beer Bottles	1,924	0.2
Nonrefillable Soft Drink Bottles	2,886	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	14,429	1.5
Nonrecyclable Glass	5,772	0.6
<b>METAL</b>		
Aluminum Cans	1,92	0.2
Aluminum Containers	0	0.0
Tin Cans	5,772	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	34,630	3.6
Ferrous Metals	46,173	4.8
White Goods	22,125	2.3
Nonferrous Metals	8,658	0.9
<b>PAPER</b>		
Newsprint	11,54	1.2
Corrugated Containers	33,668	3.5
Computer Paper	0	0.0
Office Paper	3,848	0.4
Mixed Waste Paper	30,782	3.2
Nonrecyclable Paper	17,315	1.8
<b>PLASTICS</b>		
PET Bottles	96	0.1
HDPE Bottles	962	0.1
Plastic Packaging	15,391	1.6
Other Plastic Products	11,543	1.2
Expanded Polystyrene	1,924	0.2
<b>RUBBER</b>		
Rubber Products	4,81	0.5
Tires	5,772	0.6
<b>ORGANIC</b>		
Food	32,70	3.4
Lawn and Garden Waste	297,241	30.8
Wood Waste	151,025	15.7
<b>OTHER</b>		
Disposable Diapers	1,92	0.2
Textiles	48,097	5.0
Leather	962	0.1
Inert Material and Fines	72,146	7.5
Ash	5,772	0.6
Construction Debris (other than wood)	56,755	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	3,848	0.4
Oil	962	0.1
Other Chemicals	6,734	0.7
Total	963,869	

FIGURE VI-2

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
West Waste Generation Area

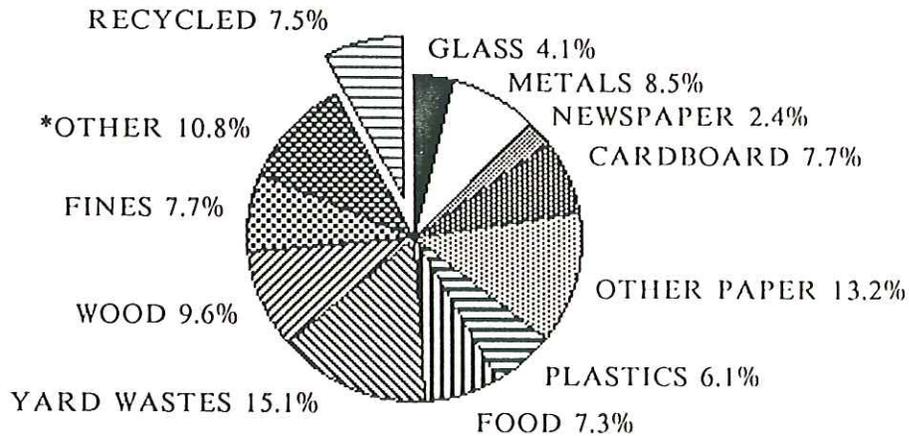
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 249,300



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



\*rubber, textiles, construction debris, hazardous, etc.

CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-6

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
West Waste Generation Area  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	2,780	1.21	Note 2		Note 2	N/A
Refillable Beer Bottles	417	0.18	900	68.32	1,317	0.53
Nonrefillable Soft Drink Bottles	1,140	0.49	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	6	0.00	0	0.00	6	0.00
Container Glass	4,113	1.78	600	6.95	8,633	3.47
Nonrecyclable Glass	1,819	0.79			1,819	0.73
<b>METAL</b>						
Aluminum Cans	847	0.37	300	26.16	1,147	0.46
Aluminum Containers	250	0.11	0	0.00	250	0.10
Tin Cans	2,311	1.00	0	0.00	2,311	0.92
Bi-Metal Cans	0	0.00	0	0.00	0	0.00
Mixed Metals/Materials	5,409	2.34			5,409	2.17
Ferrous Metals	9,569	4.15	9,200	49.02	18,769	7.53
White Goods	1,958	0.85	100	4.86	2,058	0.83
Nonferrous Metals	942	0.41	1,000	51.48	1,942	0.78
<b>PAPER</b>						
Newsprint	6,108	2.65	2,500	29.04	8,608	3.45
Corrugated Containers	19,076	8.27	2,500	11.59	21,576	8.65
Computer Paper	1,768	0.77	0	0.00	1,768	0.71
Office Paper	2,747	1.19	0	0.00	2,747	1.10
Mixed Waste Paper	17,512	7.59	0	0.00	17,512	7.02
Nonrecyclable Paper	10,842	4.70			10,842	4.35
<b>PLASTICS</b>						
PET Bottles	305	0.13	0	0.00	305	0.12
HDPE Bottles	520	0.23	0	0.00	520	0.21
Plastic Packaging	8,391	3.64			8,391	3.37
Other Plastic Products	4,690	2.03			4,690	1.88
Expanded Polystyrene	1,298	0.56			1,298	0.52
<b>RUBBER</b>						
Rubber Products	2,128	0.92			2,128	0.85
Tires	1,795	0.78	0	0.00	1,795	0.72
<b>ORGANIC</b>						
Food	18,091	7.84			18,091	7.26
Lawn and Garden Waste	37,725	16.35			37,725	15.13
Wood Waste	23,898	10.36			23,898	9.59
<b>OTHER</b>						
Disposable Diapers	1,597	0.69			1,597	0.64
Textiles	7,677	3.33			7,677	3.08
Leather	177	0.08			177	0.07
Inert Material and Fines	19,149	8.30			19,149	7.67
Ash	3,305	1.43			3,305	1.32
Construction Debris (other than wood)	6,440	2.79			6,440	2.58
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	405	0.18	300	42.57	705	0.28
Oil	192	0.08	1,200	86.22	1,392	0.56
Other Chemicals	3,320	1.44			3,320	1.33
<b>Total</b>	<b>230,717</b>		<b>18,600</b>		<b>249,317</b>	

1. Includes reported construction/demolition tonnage

2. Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

**TABLE VI-7**  
**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**West Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	504	1.2
Refillable Beer Bottles	126	0.3
Nonrefillable Soft Drink Bottles	378	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	1,931	4.6
Nonrecyclable Glass	84	0.2
<b>METAL</b>		
Aluminum Cans	336	0.8
Aluminum Containers	84	0.2
Tin Cans	1,049	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	336	0.8
Ferrous Metals	252	0.6
White Goods	42	0.1
Nonferrous Metals	42	0.1
<b>PAPER</b>		
Newsprint	2,393	5.7
Corrugated Containers	2,015	4.8
Computer Paper	42	0.1
Office Paper	126	0.3
Mixed Waste Paper	5,877	14.0
Nonrecyclable Paper	2,351	5.6
<b>PLASTICS</b>		
PET Bottles	168	0.4
HDPE Bottles	210	0.5
Plastic Packaging	2,477	5.9
Other Plastic Products	336	0.8
Expanded Polystyrene	168	0.4
<b>RUBBER</b>		
Rubber Products	126	0.3
Tires	210	0.5
<b>ORGANIC</b>		
Food	4,576	10.9
Lawn and Garden Waste	9,361	22.3
Wood Waste	504	1.2
<b>OTHER</b>		
Disposable Diapers	1,343	3.2
Textiles	1,301	3.1
Leather	84	0.2
Inert Material and Fines	2,729	6.5
Ash	42	0.1
Construction Debris (other than wood)	252	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	42	0.1
Oil	84	0.2
Other Chemicals	42	0.1
Total	42,020	

TABLE VI-8

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**West Waste Generation Area**  
**Commercial/Institutional Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	519	0.8
Refillable Beer Bottles	122	0.2
Nonrefillable Soft Drink Bottles	499	0.7
Refillable Soft Drink Bottles	6	0.0
Container Glass	922	1.3
Nonrecyclable Glass	938	1.4
<b>METAL</b>		
Aluminum Cans	280	0.4
Aluminum Containers	140	0.2
Tin Cans	733	1.1
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	2,053	3.0
Ferrous Metals	4,548	6.6
White Goods	0	0.0
Nonferrous Metals	134	0.2
<b>PAPER</b>		
Newsprint	2,450	3.6
Corrugated Containers	10,605	15.5
Computer Paper	901	1.3
Office Paper	1,269	1.8
Mixed Waste Paper	8,059	11.7
Nonrecyclable Paper	5,121	7.5
<b>PLASTICS</b>		
PET Bottles	54	0.1
HDPE Bottles	15	0.0
Plastic Packaging	4,170	6.1
Other Plastic Products	1,387	2.0
Expanded Polystyrene	854	1.2
<b>RUBBER</b>		
Rubber Products	1,338	1.9
Tires	1,068	1.6
<b>ORGANIC</b>		
Food	8,969	13.1
Lawn and Garden Waste	2,337	3.4
Wood Waste	4,857	7.1
<b>OTHER</b>		
Disposable Diapers	87	0.1
Textiles	1,997	2.9
Leather	10	0.0
Inert Material and Fines	1,217	1.8
Ash	30	0.0
Construction Debris (other than wood)	776	1.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	30	0.0
Oil	25	0.0
Other Chemicals	124	0.2
Total	68,645	

TABLE VI-9

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
West Waste Generation Area  
 Manufacturing Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	1,506	4.3
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	11	0.0
Refillable Soft Drink Bottles	0	0.0
Container Glass	7	0.0
Nonrecyclable Glass	297	0.8
<b>METAL</b>		
Aluminum Cans	64	0.2
Aluminum Containers	25	0.1
Tin Cans	28	0.1
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	21	0.1
Ferrous Metals	707	2.0
White Goods	0	0.0
Nonferrous Metals	14	0.0
<b>PAPER</b>		
Newsprint	255	0.7
Corrugated Containers	3,472	9.8
Computer Paper	824	2.3
Office Paper	1,018	2.9
Mixed Waste Paper	866	2.5
Nonrecyclable Paper	1,846	5.2
<b>PLASTICS</b>		
PET Bottles	0	0.0
HDPE Bottles	212	0.6
Plastic Packaging	361	1.0
Other Plastic Products	1,959	5.5
Expanded Polystyrene	99	0.3
<b>RUBBER</b>		
Rubber Products	241	0.7
Tires	18	0.1
<b>ORGANIC</b>		
Food	1,715	4.9
Lawn and Garden Waste	297	0.8
Wood Waste	5,057	14.3
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	202	0.6
Leather	0	0.0
Inert Material and Fines	8,617	24.4
Ash	2,733	7.7
Construction Debris (other than wood)	325	0.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	0	0.0
Oil	0	0.0
Other Chemicals	2,567	7.3
Total	35,364	

TABLE VI-10

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
West Waste Generation Area  
 Self-haul Waste Stream

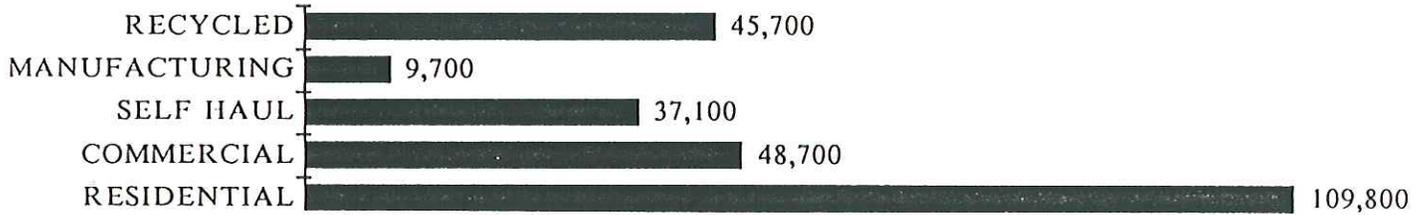
CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	250	0.3
Refillable Beer Bottles	167	0.2
Nonrefillable Soft Drink Bottles	250	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	1,249	1.5
Nonrecyclable Glass	500	0.6
<b>METAL</b>		
Aluminum Cans	167	0.2
Aluminum Containers	0	0.0
Tin Cans	500	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	2,998	3.6
Ferrous Metals	3,997	4.8
White Goods	1,915	2.3
Nonferrous Metals	749	0.9
<b>PAPER</b>		
Newsprint	999	1.2
Corrugated Containers	2,914	3.5
Computer Paper	0	0.0
Office Paper	333	0.4
Mixed Waste Paper	2,665	3.2
Nonrecyclable Paper	1,499	1.8
<b>PLASTICS</b>		
PET Bottles	83	0.1
HDPE Bottles	83	0.1
Plastic Packaging	1,332	1.6
Other Plastic Products	999	1.2
Expanded Polystyrene	167	0.2
<b>RUBBER</b>		
Rubber Products	416	0.5
Tires	500	0.6
<b>ORGANIC</b>		
Food	2,831	3.4
Lawn and Garden Waste	25,730	30.9
Wood Waste	13,073	15.7
<b>OTHER</b>		
Disposable Diapers	167	0.2
Textiles	4,164	5.0
Leather	83	0.1
Inert Material and Fines	6,245	7.5
Ash	500	0.6
Construction Debris (other than wood)	4,913	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	333	0.4
Oil	83	0.1
Other Chemicals	583	0.7
Total	83,437	

FIGURE VI-3

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
Northwest Waste Generation Area

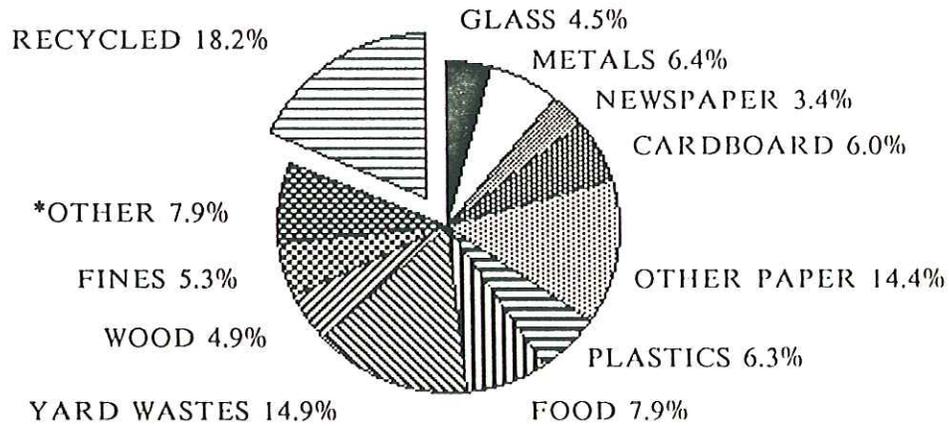
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 251,000



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



\*rubber, textiles, construction debris, hazardous, etc.

CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-11

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Northwest Waste Generation Area**  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	1,947	0.95	Note 2		Note 2	N/A
Refillable Beer Bottles	492	0.24	1,100	69.09	1,592	0.63
Nonrefillable Soft Drink Bottles	1,445	0.7	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	0	0	0	0.0	0	0
Container Glass	6,286	3.06	400	3.97	10,078	4.02
Nonrecyclable Glass	1,219	0.59			1,219	0.49
<b>METAL</b>						
Aluminum Cans	1,163	0.57	700	37.57	1,863	0.74
Aluminum Containers	323	0.16	0	0.0	323	0.13
Tin Cans	3,530	1.72	100	2.75	3,630	1.45
Bi-Metal Cans	11	0.01	0	0.0	11	0
Mixed Metals/Materials	3,614	1.76			3,614	1.44
Ferrous Metals	5,938	2.89	34,000	85.13	39,938	15.91
White Goods	961	0.47	200	17.22	1,161	0.46
Nonferrous Metals	553	0.27	800	59.13	1,353	0.54
<b>PAPER</b>						
Newsprint	8,426	4.1	2,800	24.94	11,226	4.47
Corrugated Containers	15,121	7.37	2,800	15.62	17,921	7.14
Computer Paper	953	0.46	100	9.5	1,053	0.42
Office Paper	1,608	0.78	200	11.06	1,808	0.72
Mixed Waste Paper	22,431	10.93	200	0.88	22,631	9.02
Nonrecyclable Paper	11,028	5.37			11,028	4.39
<b>PLASTICS</b>						
PET Bottles	520	0.25	0	0.0	520	0.21
HDPE Bottles	652	0.32	0	0.0	652	0.26
Plastic Packaging	10,379	5.06			10,379	4.14
Other Plastic Products	2,853	1.39			2,853	1.14
Expanded Polystyrene	1,312	0.64			1,312	0.52
<b>RUBBER</b>						
Rubber Products	1,674	0.82			1,674	0.67
Tires	1,522	0.74	0	0.0	1,522	0.61
<b>ORGANIC</b>						
Food	19,813	9.65			19,813	7.89
Lawn and Garden Waste	37,463	18.25			37,463	14.93
Wood Waste	12,231	5.96			12,231	4.87
<b>OTHER</b>						
Disposable Diapers	3,645	1.78			3,645	1.45
Textiles	6,774	3.3			6,774	2.7
Leather	274	0.13			274	0.11
Inert Material and Fines	13,198	6.43			13,198	5.26
Ash	795	0.39			795	0.32
Construction Debris (other than wood)	3,737	1.82			3,737	1.49
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	280	0.14	1,500	84.27	1,780	0.71
Oil	275	0.13	800	74.39	1,075	0.43
Other Chemicals	837	0.41			837	0.33
<b>Total</b>	<b>205,282</b>		<b>45,700</b>		<b>250,982</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-12

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Northwest Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	1,316	1.2
Refillable Beer Bottles	329	0.3
Nonrefillable Soft Drink Bottles	987	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	5,044	4.6
Nonrecyclable Glass	219	0.2
<b>METAL</b>		
Aluminum Cans	877	0.8
Aluminum Containers	219	0.2
Tin Cans	2,741	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	877	0.8
Ferrous Metals	658	0.6
White Goods	110	0.1
Nonferrous Metals	110	0.1
<b>PAPER</b>		
Newsprint	6,250	5.7
Corrugated Containers	5,263	4.8
Computer Paper	110	0.1
Office Paper	329	0.3
Mixed Waste Paper	15,351	14.0
Nonrecyclable Paper	6,140	5.6
<b>PLASTICS</b>		
PET Bottles	439	0.4
HDPE Bottles	548	0.5
Plastic Packaging	6,469	5.9
Other Plastic Products	877	0.8
Expanded Polystyrene	439	0.4
<b>RUBBER</b>		
Rubber Products	329	0.3
Tires	548	0.5
<b>ORGANIC</b>		
Food	11,952	10.9
Lawn and Garden Waste	24,452	22.3
Wood Waste	1,316	1.2
<b>OTHER</b>		
Disposable Diapers	3,509	3.2
Textiles	3,399	3.1
Leather	219	0.2
Inert Material and Fines	7,127	6.5
Ash	110	0.1
Construction Debris (other than wood)	658	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	110	0.1
Oil	219	0.2
Other Chemicals	110	0.1
Total	109,761	

TABLE VI-13

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Northwest Waste Generation Area**  
**Commercial/Institutional Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	365	0.8
Refillable Beer Bottles	87	0.2
Nonrefillable Soft Drink Bottles	339	0.7
Refillable Soft Drink Bottles	0	0.0
Container Glass	652	1.4
Nonrecyclable Glass	665	1.4
<b>METAL</b>		
Aluminum Cans	190	0.4
Aluminum Containers	94	0.2
Tin Cans	520	1.1
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,370	2.9
Ferrous Metals	3,243	6.8
White Goods	0	0.0
Nonferrous Metals	95	0.2
<b>PAPER</b>		
Newsprint	1,641	3.5
Corrugated Containers	7,475	15.7
Computer Paper	591	1.2
Office Paper	832	1.8
Mixed Waste Paper	5,317	11.2
Nonrecyclable Paper	3,566	7.5
<b>PLASTICS</b>		
PET Bottles	37	0.1
HDPE Bottles	11	0.0
Plastic Packaging	2,953	6.2
Other Plastic Products	990	2.1
Expanded Polystyrene	610	1.3
<b>RUBBER</b>		
Rubber Products	961	2.0
Tires	746	1.6
<b>ORGANIC</b>		
Food	6,358	13.4
Lawn and Garden Waste	1,488	3.1
Wood Waste	3,286	6.9
<b>OTHER</b>		
Disposable Diapers	62	0.1
Textiles	1,431	3.0
Leather	5	0.0
Inert Material and Fines	853	1.8
Ash	16	0.0
Construction Debris (other than wood)	518	1.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	21	0.0
Oil	17	0.0
Other Chemicals	86	0.2
Total	47,492	

TABLE VI-14

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Northwest Waste Generation Area**  
**Manufacturing Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	154	1.6
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	6	0.1
Refillable Soft Drink Bottles	0	0.0
Container Glass	31	0.3
Nonrecyclable Glass	113	1.2
<b>METAL</b>		
Aluminum Cans	20	0.2
Aluminum Containers	9	0.1
Tin Cans	47	0.5
Bi-Metal Cans	11	0.1
Mixed Metals/Materials	35	0.4
Ferrous Metals	198	2.0
White Goods	0	0
Nonferrous Metals	13	0.1
<b>PAPER</b>		
Newsprint	80	0.8
Corrugated Containers	1,019	10.5
Computer Paper	251	2.6
Office Paper	299	3.1
Mixed Waste Paper	535	5.5
Nonrecyclable Paper	630	6.5
<b>PLASTICS</b>		
PET Bottles	8	0.1
HDPE Bottles	56	0.6
Plastic Packaging	314	3.2
Other Plastic Products	534	5.5
Expanded Polystyrene	179	1.8
<b>RUBBER</b>		
Rubber Products	192	2.0
Tires	6	0.1
<b>ORGANIC</b>		
Food	245	2.5
Lawn and Garden Waste	96	1.0
Wood Waste	1,417	14.6
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	82	0.8
Leather	13	0.1
Inert Material and Fines	2,105	21.6
Ash	447	4.6
Construction Debris (other than wood)	205	2.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	1	0.0
Oil	2	0.0
Other Chemicals	378	3.9
Total	9,723	

TABLE VI-15

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Northwest Waste Generation Area  
 Self-haul Waste Stream

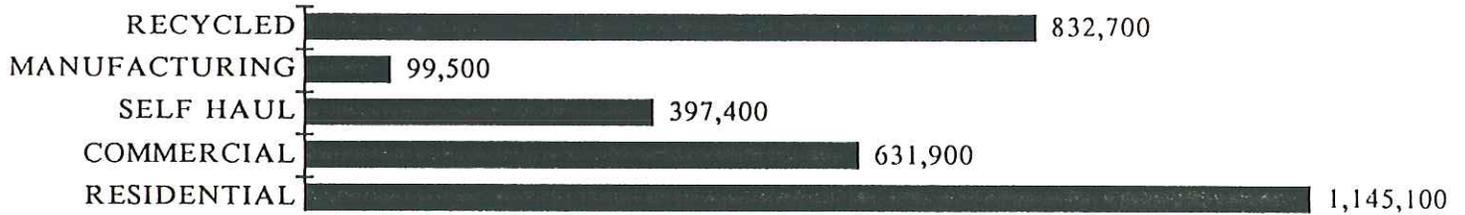
CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	111	0.3
Refillable Beer Bottles	74	0.2
Nonrefillable Soft Drink Bottles	111	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	555	1.5
Nonrecyclable Glass	222	0.6
<b>METAL</b>		
Aluminum Cans	74	0.2
Aluminum Containers	0	0.0
Tin Cans	222	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,331	3.6
Ferrous Metals	1,775	4.8
White Goods	851	2.3
Nonferrous Metals	333	0.9
<b>PAPER</b>		
Newsprint	444	1.2
Corrugated Containers	1,294	3.5
Computer Paper	0	0.0
Office Paper	148	0.4
Mixed Waste Paper	1,183	3.2
Nonrecyclable Paper	666	1.8
<b>PLASTICS</b>		
PET Bottles	37	0.1
HDPE Bottles	37	0.1
Plastic Packaging	592	1.6
Other Plastic Products	444	1.2
Expanded Polystyrene	74	0.2
<b>RUBBER</b>		
Rubber Products	185	0.5
Tires	222	0.6
<b>ORGANIC</b>		
Food	1,257	3.4
Lawn and Garden Waste	11,427	30.9
Wood Waste	5,806	15.7
<b>OTHER</b>		
Disposable Diapers	74	0.2
Textiles	1,849	5.0
Leather	37	0.1
Inert Material and Fines	2,774	7.5
Ash	222	0.6
Construction Debris (other than wood)	2,182	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	148	0.4
Oil	37	0.1
Other Chemicals	259	0.7
Total	37,054	

FIGURE VI-4

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
Puget Sound Waste Generation Area

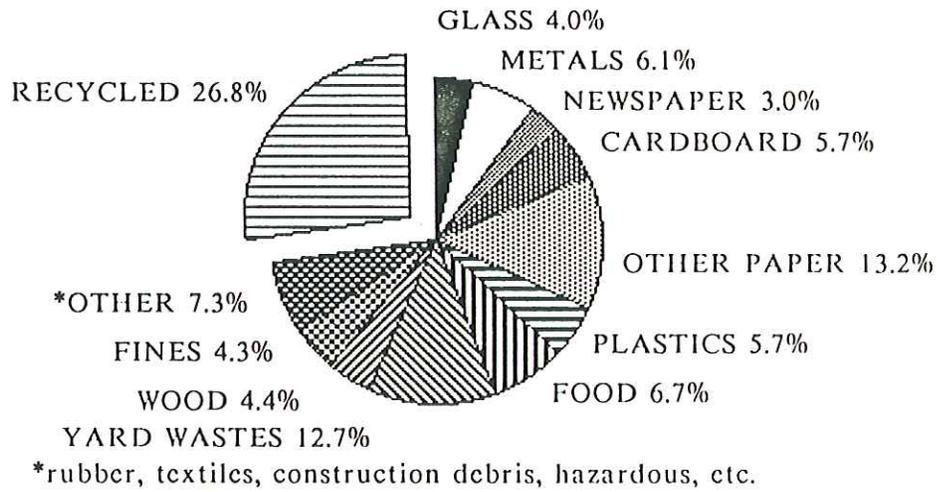
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 3,106,600



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-16

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Puget Sound Waste Generation Area**  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	20,194	0.89	Note 2		Note 2	N/A
Refillable Beer Bottles	5,500	0.24	12,000	68.57	17,500	0.56
Nonrefillable Soft Drink Bottles	15,933	0.7	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	12	0	700	98.37	712	0.02
Container Glass	66,609	2.93	15,400	13.04	118,136	3.80
Nonrecyclable Glass	16,261	0.72			16,261	0.52
<b>METAL</b>						
Aluminum Cans	12,592	0.55	3,700	22.71	16,292	0.52
Aluminum Containers	3,414	0.15	0	0.00	3,414	0.11
Tin Cans	36,653	1.61	500	1.35	37,153	1.2
Bi-Metal Cans	10	0	0	0.0	10	0
Mixed Metals/Materials	42,093	1.85			42,093	1.35
Ferrous Metals	76,918	3.38	243,200	75.97	320,118	10.3
White Goods	10,287	0.45	24,300	70.26	34,587	1.11
Nonferrous Metals	6,544	0.29	33,300	83.58	39,844	1.23
<b>PAPER</b>						
Newsprint	92,183	4.05	127,900	58.11	220,083	7.08
Corrugated Containers	178,575	7.85	235,900	56.92	414,475	13.34
Computer Paper	11,720	0.52	14,400	55.13	26,120	0.84
Office Paper	20,540	0.9	30,500	59.76	51,040	1.64
Mixed Waste Paper	257,766	11.34	28,900	10.08	286,666	9.23
Nonrecyclable Paper	121,404	5.34			121,404	3.91
<b>PLASTICS</b>						
PET Bottles	5,588	0.25	0	0.0	5,588	0.18
HDPE Bottles	6,969	0.31	0	0.0	6,969	0.22
Plastic Packaging	113,510	4.99			113,510	3.65
Other Plastic Products	37,261	1.64			37,261	1.2
Expanded Polystyrene	14,821	0.65			14,821	0.48
<b>RUBBER</b>						
Rubber Products	22,246	0.98			22,246	0.72
Tires	20,143	0.89	7,500	27.13	27,643	0.89
<b>ORGANIC</b>						
Food	209,292	9.2			209,292	6.74
Lawn and Garden Waste	394,798	17.36			394,798	12.71
Wood Waste	137,229	6.03			137,229	4.42
<b>OTHER</b>						
Disposable Diapers	38,232	1.68			38,232	1.23
Textiles	80,975	3.56			80,975	2.61
Leather	2,994	0.13			2,994	0.1
Inert Material and Fines	132,866	5.84			132,866	4.28
Ash	5,927	0.26			5,927	0.19
Construction Debris (other than wood)	42,621	1.87			42,621	1.37
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	3,117	0.14	15,000	82.79	18,117	0.58
Oil	3,024	0.13	39,500	92.89	42,524	1.37
Other Chemicals	7,180	0.32			7,180	0.23
<b>Total</b>	<b>2,273,999</b>		<b>832,700</b>		<b>3,106,699</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-17

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Puget Sound Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	13,727	1.2
Refillable Beer Bottles	3,432	0.3
Nonrefillable Soft Drink Bottles	10,295	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	52,621	4.6
Nonrecyclable Glass	2,288	0.2
<b>METAL</b>		
Aluminum Cans	9,152	0.8
Aluminum Containers	2,288	0.2
Tin Cans	28,599	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	9,152	0.8
Ferrous Metals	6,864	0.6
White Goods	1,144	0.1
Nonferrous Metals	1,144	0.1
<b>PAPER</b>		
Newsprint	65,205	5.7
Corrugated Containers	54,909	4.8
Computer Paper	1,144	0.1
Office Paper	3,432	0.3
Mixed Waste Paper	160,152	14.0
Nonrecyclable Paper	64,061	5.6
<b>PLASTICS</b>		
PET Bottles	4,576	0.4
HDPE Bottles	5,720	0.5
Plastic Packaging	67,493	5.9
Other Plastic Products	9,152	0.8
Expanded Polystyrene	4,576	0.4
<b>RUBBER</b>		
Rubber Products	3,432	0.3
Tires	5,720	0.5
<b>ORGANIC</b>		
Food	124,690	10.9
Lawn and Garden Waste	255,099	22.3
Wood Waste	13,727	1.2
<b>OTHER</b>		
Disposable Diapers	36,606	3.2
Textiles	35,462	3.1
Leather	2,288	0.2
Inert Material and Fines	74,356	6.5
Ash	1,144	0.1
Construction Debris (other than wood)	6,864	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	1,144	0.1
Oil	2,288	0.2
Other Chemicals	1,144	0.1
Total	1,145,085	

TABLE VI-18

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Puget Sound Waste Generation Area  
 Commercial/Institutional Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	4,450	0.7
Refillable Beer Bottles	1,234	0.2
Nonrefillable Soft Drink Bottles	4,347	0.7
Refillable Soft Drink Bottles	12	0.0
Container Glass	7,609	1.2
Nonrecyclable Glass	10,429	1.7
<b>METAL</b>		
Aluminum Cans	2,338	0.4
Aluminum Containers	1,036	0.2
Tin Cans	5,525	0.9
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	18,174	3.0
Ferrous Metals	44,655	7.3
White Goods	0	0.0
Nonferrous Metals	1,222	0.2
<b>PAPER</b>		
Newsprint	21,337	3.5
Corrugated Containers	95,776	15.7
Computer Paper	8,087	1.3
Office Paper	11,570	1.9
Mixed Waste Paper	67,522	11.0
Nonrecyclable Paper	43,323	7.1
<b>PLASTICS</b>		
PET Bottles	506	0.1
HDPE Bottles	106	0.0
Plastic Packaging	36,591	6.0
Other Plastic Products	13,820	2.3
Expanded Polystyrene	6,630	1.1
<b>RUBBER</b>		
Rubber Products	15,683	2.6
Tires	12,023	2.0
<b>ORGANIC</b>		
Food	69,225	11.3
Lawn and Garden Waste	16,549	2.7
Wood Waste	45,582	7.5
<b>OTHER</b>		
Disposable Diapers	833	0.1
Textiles	23,295	3.8
Leather	61	0.0
Inert Material and Fines	12,210	2.0
Ash	193	0.0
Construction Debris (other than wood)	7,736	1.3
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	367	0.1
Oil	330	0.1
Other Chemicals	1,038	0.2
Total	611,425	

TABLE VI-19

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Puget Sound Waste Generation Area**  
**Manufacturing Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	806	0.8
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	60	0.1
Refillable Soft Drink Bottles	0	0.0
Container Glass	368	0.4
Nonrecyclable Glass	1,165	1.2
<b>METAL</b>		
Aluminum Cans	289	0.3
Aluminum Containers	70	0.1
Tin Cans	149	0.2
Bi-Metal Cans	10	0.0
Mixed Metals/Materials	468	0.5
Ferrous Metals	5,295	5.3
White Goods	0	0.0
Nonferrous Metals	567	0.6
<b>PAPER</b>		
Newsprint	697	0.7
Corrugated Containers	12,880	12.9
Computer Paper	2,468	2.5
Office Paper	3,952	4.0
Mixed Waste Paper	16,662	16.7
Nonrecyclable Paper	6,450	6.5
<b>PLASTICS</b>		
PET Bottles	109	0.1
HDPE Bottles	747	0.8
Plastic Packaging	2,240	2.3
Other Plastic Products	9,386	9.4
Expanded Polystyrene	2,658	2.7
<b>RUBBER</b>		
Rubber Products	1,025	1.0
Tires	20	0.0
<b>ORGANIC</b>		
Food	1,891	1.9
Lawn and Garden Waste	587	0.6
Wood Waste	8,968	9.0
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	2,160	2.2
Leather	249	0.3
Inert Material and Fines	10,979	11.0
Ash	2,210	2.2
Construction Debris (other than wood)	1,772	1.8
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	20	0.0
Oil	10	0.0
Other Chemicals	2,160	2.2
<b>Total</b>	<b>99,546</b>	

TABLE VI-20

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Puget Sound Waste Generation Area  
 Self-haul Waste Stream

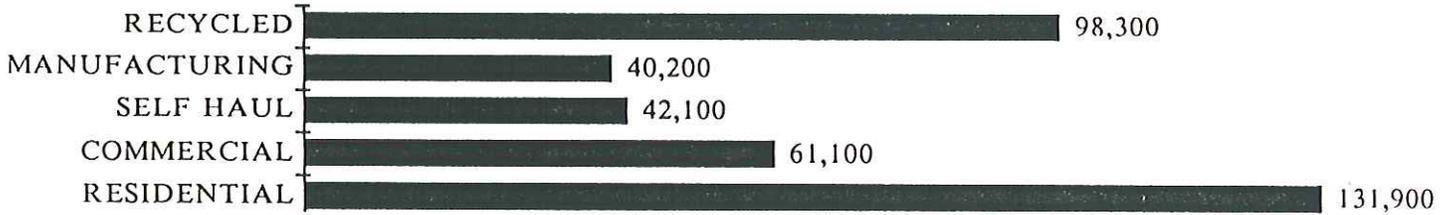
CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	1,190	0.3
Refillable Beer Bottles	793	0.2
Nonrefillable Soft Drink Bottles	1,190	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	5,950	1.5
Nonrecyclable Glass	2,380	0.6
<b>METAL</b>		
Aluminum Cans	793	0.2
Aluminum Containers	0	0.0
Tin Cans	2,380	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	14,279	3.6
Ferrous Metals	19,039	4.8
White Goods	9,123	2.3
Nonferrous Metals	3,570	0.9
<b>PAPER</b>		
Newsprint	4,760	1.2
Corrugated Containers	13,883	3.5
Computer Paper	0	0.0
Office Paper	1,587	0.4
Mixed Waste Paper	12,693	3.2
Nonrecyclable Paper	7,140	1.8
<b>PLASTICS</b>		
PET Bottles	397	0.1
HDPE Bottles	397	0.1
Plastic Packaging	6,346	1.6
Other Plastic Products	4,760	1.2
Expanded Polystyrene	793	0.2
<b>RUBBER</b>		
Rubber Products	1,983	0.5
Tires	2,380	0.6
<b>ORGANIC</b>		
Food	13,486	3.4
Lawn and Garden Waste	122,563	30.9
Wood Waste	62,273	15.7
<b>OTHER</b>		
Disposable Diapers	793	0.2
Textiles	19,832	5.0
Leather	397	0.1
Inert Material and Fines	29,748	7.5
Ash	2,380	0.6
Construction Debris (other than wood)	23,402	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	1,587	0.4
Oil	397	0.1
Other Chemicals	2,777	0.7
Total	397,436	

FIGURE VI-5

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
Southwest Waste Generation Area

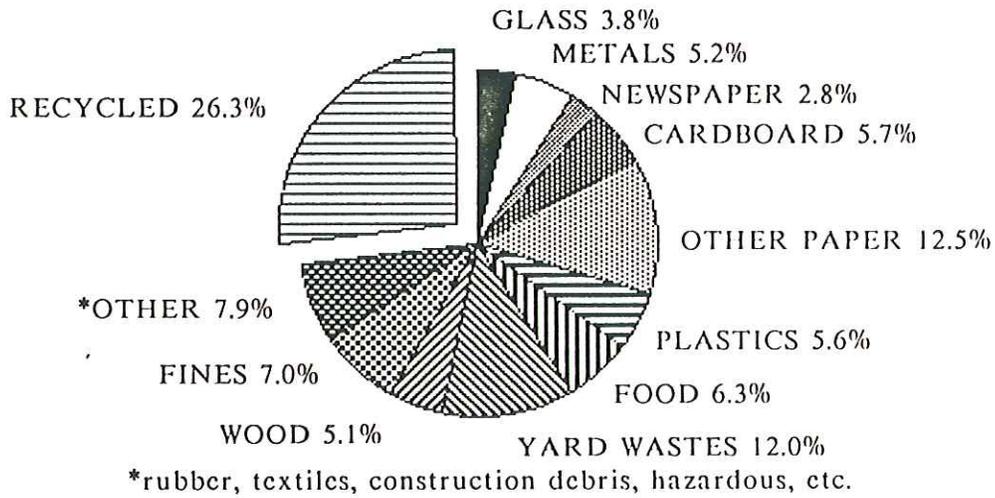
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 373,600



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-21

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Southwest Waste Generation Area**  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	2,733	0.99	Note 2		Note 2	N/A
Refillable Beer Bottles	591	0.21	1,000	62.86	1,591	0.43
Nonrefillable Soft Drink Bottles	1,718	0.62	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	1	0.00	0	0.00	1	0.00
Container Glass	7,426	2.70	1,200	9.18	13,077	3.50
Nonrecyclable Glass	1,702	0.62			1,702	0.46
<b>METAL</b>						
Aluminum Cans	1,436	0.52	600	29.47	2,036	0.55
Aluminum Containers	416	0.15	0	0.00	416	0.11
Tin Cans	4,119	1.50	0	0.00	4,119	1.10
Bi-Metal Cans	0	0.00	0	0.00	0	0.00
Mixed Metals/Materials	4,212	1.53			4,212	1.13
Ferrous Metals	7,359	2.67	62,400	89.45	69,759	18.67
White Goods	1,106	0.40	0	0.00	1,106	0.30
Nonferrous Metals	644	0.23	1,500	69.96	2,144	0.57
<b>PAPER</b>						
Newsprint	10,303	3.74	7,500	42.13	17,803	4.77
Corrugated Containers	21,130	7.68	7,000	24.88	28,130	7.53
Computer Paper	1,907	0.69	1,200	38.62	3,107	0.83
Office Paper	2,686	0.98	900	25.10	3,586	0.96
Mixed Waste Paper	27,385	9.95	3,500	11.33	30,885	8.27
Nonrecyclable Paper	14,710	5.34			14,710	3.94
<b>PLASTICS</b>						
PET Bottles	620	0.23	0	0.00	620	0.17
HDPE Bottles	965	0.35	1,700	63.79	2,665	0.71
Plastic Packaging	12,652	4.60			12,652	3.39
Other Plastic Products	5,123	1.86			5,123	1.37
Expanded Polystyrene	1,531	0.56			1,531	0.41
<b>RUBBER</b>						
Rubber Products	2,281	0.83			2,281	0.61
Tires	1,807	0.66	500	21.68	2,307	0.62
<b>ORGANIC</b>						
Food	23,367	8.49			23,367	6.25
Lawn and Garden Waste	44,685	16.23			44,685	11.96
Wood Waste	19,094	6.94			19,094	5.11
<b>OTHER</b>						
Disposable Diapers	4,369	1.59			4,369	1.17
Textiles	8,444	3.07			8,444	2.26
Leather	375	0.14			375	0.10
Inert Material and Fines	26,049	9.46			26,049	6.97
Ash	3,727	1.35			3,727	1.00
Construction Debris (other than wood)	5,477	1.99			5,477	1.47
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	329	0.12	1,800	84.55	2,129	0.57
Oil	334	0.12	7,500	95.73	7,834	2.10
Other Chemicals	2,476	0.90			2,476	0.66
<b>Total</b>	<b>275,290</b>		<b>98,300</b>		<b>373,590</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-22

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Southwest Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	1,581	1.2
Refillable Beer Bottles	395	0.3
Nonrefillable Soft Drink Bottles	1,186	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	6,060	4.6
Nonrecyclable Glass	263	0.2
<b>METAL</b>		
Aluminum Cans	1,054	0.8
Aluminum Containers	263	0.2
Tin Cans	3,293	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,054	0.8
Ferrous Metals	790	0.6
White Goods	132	0.1
Nonferrous Metals	132	0.1
<b>PAPER</b>		
Newsprint	7,509	5.7
Corrugated Containers	6,323	4.8
Computer Paper	132	0.1
Office Paper	395	0.3
Mixed Waste Paper	18,443	14.0
Nonrecyclable Paper	7,377	5.6
<b>PLASTICS</b>		
PET Bottles	527	0.4
HDPE Bottles	659	0.5
Plastic Packaging	7,773	5.9
Other Plastic Products	1,054	0.8
Expanded Polystyrene	527	0.4
<b>RUBBER</b>		
Rubber Products	395	0.3
Tires	659	0.5
<b>ORGANIC</b>		
Food	14,359	10.9
Lawn and Garden Waste	29,378	22.3
Wood Waste	1,581	1.2
<b>OTHER</b>		
Disposable Diapers	4,216	3.2
Textiles	4,084	3.1
Leather	263	0.2
Inert Material and Fines	8,563	6.5
Ash	132	0.1
Construction Debris (other than wood)	790	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	132	0.1
Oil	263	0.2
Other Chemicals	132	0.1
<b>Total</b>	<b>131,870</b>	

TABLE VI-23

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Southwest Waste Generation Area  
 Commercial/Institutional Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	391	0.7
Refillable Beer Bottles	96	0.2
Nonrefillable Soft Drink Bottles	382	0.7
Refillable Soft Drink Bottles	1	0.0
Container Glass	684	1.3
Nonrecyclable Glass	793	1.5
<b>METAL</b>		
Aluminum Cans	218	0.4
Aluminum Containers	109	0.2
Tin Cans	529	1.0
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,549	2.9
Ferrous Metals	3,610	6.8
White Goods	0	0.0
Nonferrous Metals	110	0.2
<b>PAPER</b>		
Newsprint	1,873	3.5
Corrugated Containers	8,244	15.5
Computer Paper	707	1.3
Office Paper	1,026	1.9
Mixed Waste Paper	6,270	11.8
Nonrecyclable Paper	3,880	7.3
<b>PLASTICS</b>		
PET Bottles	43	0.1
HDPE Bottles	11	0.0
Plastic Packaging	3,208	6.0
Other Plastic Products	1,095	2.1
Expanded Polystyrene	628	1.2
<b>RUBBER</b>		
Rubber Products	1,115	2.1
Tires	884	1.7
<b>ORGANIC</b>		
Food	6,706	12.6
Lawn and Garden Waste	1,888	3.5
Wood Waste	3,764	7.1
<b>OTHER</b>		
Disposable Diapers	70	0.1
Textiles	1,662	3.1
Leather	10	0.0
Inert Material and Fines	955	1.8
Ash	20	0.0
Construction Debris (other than wood)	606	1.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	25	0.0
Oil	25	0.0
Other Chemicals	94	0.2
Total	53,275	

TABLE VI-24

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Southwest Waste Generation Area  
 Manufacturing Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	627	1.6
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	8	0.0
Refillable Soft Drink Bottles	0	0.0
Container Glass	28	0.1
Nonrecyclable Glass	394	1.0
<b>METAL</b>		
Aluminum Cans	72	0.2
Aluminum Containers	36	0.1
Tin Cans	44	0.1
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	88	0.2
Ferrous Metals	535	1.3
White Goods	0	0.0
Nonferrous Metals	8	0.0
<b>PAPER</b>		
Newsprint	346	0.9
Corrugated Containers	4,662	11.6
Computer Paper	1,061	2.6
Office Paper	1,097	2.7
Mixed Waste Paper	1,045	2.6
Nonrecyclable Paper	2,532	6.3
<b>PLASTICS</b>		
PET Bottles	8	0.0
HDPE Bottles	253	0.6
Plastic Packaging	679	1.7
Other Plastic Products	2,415	6.0
Expanded Polystyrene	229	0.6
<b>RUBBER</b>		
Rubber Products	514	1.3
Tires	12	0.0
<b>ORGANIC</b>		
Food	872	2.2
Lawn and Garden Waste	430	1.1
Wood Waste	4,602	11.5
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	510	1.3
Leather	60	0.2
Inert Material and Fines	11,253	28.0
Ash	3,323	8.3
Construction Debris (other than wood)	514	1.3
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	4	0.0
Oil	4	0.0
Other Chemicals	1,933	4.8
Total	40,201	

TABLE VI-25

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Southwest Waste Generation Area**  
**Self-haul Waste Stream**

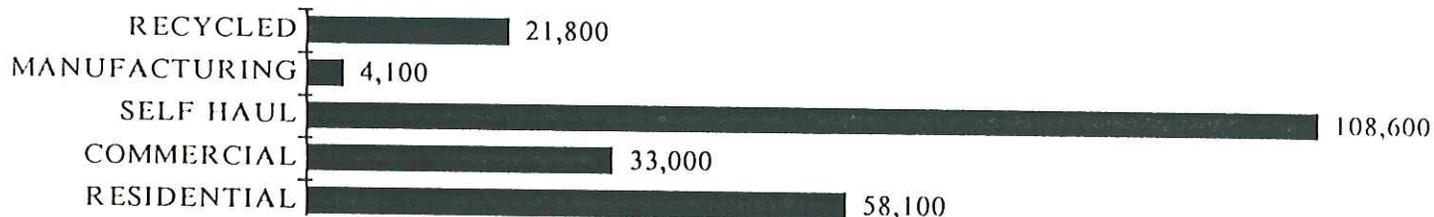
CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	126	0.3
Refillable Beer Bottles	84	0.2
Nonrefillable Soft Drink Bottles	126	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	631	1.5
Nonrecyclable Glass	252	0.6
<b>METAL</b>		
Aluminum Cans	84	0.2
Aluminum Containers	0	0.0
Tin Cans	252	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,513	3.6
Ferrous Metals	2,018	4.8
White Goods	967	2.3
Nonferrous Metals	378	0.9
<b>PAPER</b>		
Newsprint	504	1.2
Corrugated Containers	1,471	3.5
Computer Paper	0	0.0
Office Paper	168	0.4
Mixed Waste Paper	1,345	3.2
Nonrecyclable Paper	757	1.8
<b>PLASTICS</b>		
PET Bottles	42	0.1
HDPE Bottles	42	0.1
Plastic Packaging	673	1.6
Other Plastic Products	504	1.2
Expanded Polystyrene	84	0.2
<b>RUBBER</b>		
Rubber Products	210	0.5
Tires	252	0.6
<b>ORGANIC</b>		
Food	1,429	3.4
Lawn and Garden Waste	12,990	30.9
Wood Waste	6,600	15.7
<b>OTHER</b>		
Disposable Diapers	84	0.2
Textiles	2,102	5.0
Leather	42	0.1
Inert Material and Fines	3,153	7.5
Ash	252	0.6
Construction Debris (other than wood)	2,480	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	168	0.4
Oil	42	0.1
Other Chemicals	294	0.7
Total	42,123	

FIGURE VI-6

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
North Central Waste Generation Area

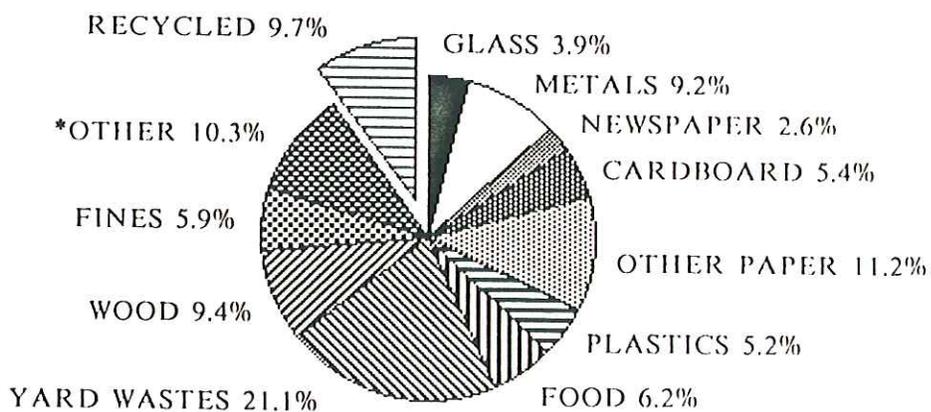
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 225,600



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



\*rubber, textiles, construction debris, hazardous, etc.

CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-26

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
North Central Waste Generation Area  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	1,333	0.65	Note 2		Note 2	N/A
Refillable Beer Bottles	446	0.22	1,100	71.15	1,546	0.69
Nonrefillable Soft Drink Bottles	1,098	0.54	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	0	0.00	300	99.88	300	0.13
Container Glass	4,712	2.31	100	1.38	7,243	3.21
Nonrecyclable Glass	1,209	0.59			1,209	0.54
<b>METAL</b>						
Aluminum Cans	811	0.40	400	33.02	1,211	0.54
Aluminum Containers	186	0.09	0	0.00	186	0.08
Tin Cans	2,396	1.18	0	0.00	2,396	1.06
Bi-Metal Cans	0	0.00	0	0.00	0	0.00
Mixed Metals/Materials	5,479	2.69			5,479	2.43
Ferrous Metals	8,216	4.03	14,700	64.15	22,916	10.16
White Goods	2,551	1.25	0	0.00	2,551	1.13
Nonferrous Metals	1,111	0.55	600	35.07	1,711	0.76
<b>PAPER</b>						
Newsprint	5,794	2.84	1,600	21.64	7,394	3.28
Corrugated Containers	12,243	6.01	2,100	14.64	14,343	6.36
Computer Paper	562	0.28	0	0.00	562	0.25
Office Paper	1,267	0.62	0	0.00	1,267	0.56
Mixed Waste Paper	15,682	7.70	0	0.00	15,682	6.95
Nonrecyclable Paper	7,744	3.80			7,744	3.43
<b>PLASTICS</b>						
PET Bottles	369	0.18	0	0.00	369	0.16
HDPE Bottles	419	0.21	0	0.00	419	0.19
Plastic Packaging	7,447	3.65			7,447	3.30
Other Plastic Products	2,645	1.30			2,645	1.17
Expanded Polystyrene	892	0.44			892	0.40
<b>RUBBER</b>						
Rubber Products	1,468	0.72			1,468	0.65
Tires	1,401	0.69	0	0.00	1,401	0.62
<b>ORGANIC</b>						
Food	14,012	6.88			14,012	6.21
Lawn and Garden Waste	47,532	23.33			47,532	21.07
Wood Waste	21,100	10.36			21,100	9.36
<b>OTHER</b>						
Disposable Diapers	2,108	1.03			2,108	0.93
Textiles	8,160	4.00			8,160	3.62
Leather	242	0.12			242	0.11
Inert Material and Fines	13,319	6.54			13,319	5.90
Ash	836	0.41			836	0.37
Construction Debris (other than wood)	7,188	3.63			7,188	3.19
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	504	0.25	400	44.24	904	0.40
Oil	239	0.12	500	67.68	739	0.33
Other Chemicals	1,025	0.56			1,025	0.45
<b>Total</b>	<b>203,748</b>		<b>21,800</b>		<b>225,548</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-27

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**North Central Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	696	1.2
Refillable Beer Bottles	174	0.3
Nonrefillable Soft Drink Bottles	522	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	2,668	4.6
Nonrecyclable Glass	116	0.2
<b>METAL</b>		
Aluminum Cans	464	0.8
Aluminum Containers	116	0.2
Tin Cans	1,450	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	464	0.8
Ferrous Metals	348	0.6
White Goods	58	0.1
Nonferrous Metals	58	0.1
<b>PAPER</b>		
Newsprint	3,307	5.7
Corrugated Containers	2,784	4.8
Computer Paper	58	0.1
Office Paper	174	0.3
Mixed Waste Paper	8,121	14.0
Nonrecyclable Paper	3,249	5.6
<b>PLASTICS</b>		
PET Bottles	232	0.4
HDPE Bottles	290	0.5
Plastic Packaging	3,423	5.9
Other Plastic Products	464	0.8
Expanded Polystyrene	232	0.4
<b>RUBBER</b>		
Rubber Products	174	0.3
Tires	290	0.5
<b>ORGANIC</b>		
Food	6,323	10.9
Lawn and Garden Waste	12,936	22.3
Wood Waste	696	1.2
<b>OTHER</b>		
Disposable Diapers	1,856	3.2
Textiles	1,798	3.1
Leather	116	0.2
Inert Material and Fines	3,771	6.5
Ash	58	0.1
Construction Debris (other than wood)	348	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	58	0.1
Oil	116	0.2
Other Chemicals	58	0.1
<b>Total</b>	<b>58,067</b>	

TABLE VI-28

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
North Central Waste Generation Area  
 Commercial/Institutional Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	225	0.7
Refillable Beer Bottles	55	0.2
Nonrefillable Soft Drink Bottles	249	0.8
Refillable Soft Drink Bottles	0	0.0
Container Glass	404	1.2
Nonrecyclable Glass	410	1.2
<b>METAL</b>		
Aluminum Cans	125	0.4
Aluminum Containers	67	0.2
Tin Cans	289	0.9
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,094	3.3
Ferrous Metals	2,571	7.8
White Goods	0	0.0
Nonferrous Metals	75	0.2
<b>PAPER</b>		
Newsprint	1,160	3.5
Corrugated Containers	5,356	16.3
Computer Paper	435	1.3
Office Paper	570	1.7
Mixed Waste Paper	3,900	11.8
Nonrecyclable Paper	2,288	6.9
<b>PLASTICS</b>		
PET Bottles	27	0.1
HDPE Bottles	6	0.0
Plastic Packaging	2,049	6.2
Other Plastic Products	732	2.2
Expanded Polystyrene	356	1.1
<b>RUBBER</b>		
Rubber Products	611	1.9
Tires	458	1.4
<b>ORGANIC</b>		
Food	3,865	11.7
Lawn and Garden Waste	1,053	3.2
Wood Waste	2,504	7.6
<b>OTHER</b>		
Disposable Diapers	35	0.1
Textiles	908	2.8
Leather	4	0.0
Inert Material and Fines	581	1.8
Ash	13	0.0
Construction Debris (other than wood)	362	1.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	13	0.0
Oil	13	0.0
Other Chemicals	65	0.2
Total	32,926	

TABLE VI-29

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**North Central Waste Generation Area**  
**Manufacturing Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	87	2.1
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	0	0.0
Refillable Soft Drink Bottles	0	0.0
Container Glass	13	0.3
Nonrecyclable Glass	33	0.8
<b>METAL</b>		
Aluminum Cans	6	0.1
Aluminum Containers	3	0.1
Tin Cans	6	0.2
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	20	0.5
Ferrous Metals	90	2.2
White Goods	0	0.0
Nonferrous Metals	2	0.1
<b>PAPER</b>		
Newsprint	27	0.7
Corrugated Containers	304	7.5
Computer Paper	69	1.7
Office Paper	90	2.2
Mixed Waste Paper	190	4.7
Nonrecyclable Paper	254	6.3
<b>PLASTICS</b>		
PET Bottles	2	0.0
HDPE Bottles	16	3.8
Plastic Packaging	238	5.8
Other Plastic Products	148	3.6
Expanded Polystyrene	87	2.1
<b>RUBBER</b>		
Rubber Products	141	3.5
Tires	3	0.1
<b>ORGANIC</b>		
Food	139	3.4
Lawn and Garden Waste	54	1.3
Wood Waste	856	21.0
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	34	0.8
Leather	13	0.3
Inert Material and Fines	814	20.0
Ash	115	2.8
Construction Debris (other than wood)	71	1.7
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	0	0.0
Oil	2	0.0
Other Chemicals	143	3.5
Total	4,069	

TABLE VI-30

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
North Central Waste Generation Area  
 Self-haul Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	325	0.3
Refillable Beer Bottles	217	0.2
Nonrefillable Soft Drink Bottles	325	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	1,626	1.5
Nonrecyclable Glass	650	0.6
<b>METAL</b>		
Aluminum Cans	217	0.2
Aluminum Containers	0	0.0
Tin Cans	650	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	3,902	3.6
Ferrous Metals	5,202	4.8
White Goods	2,493	2.3
Nonferrous Metals	975	0.9
<b>PAPER</b>		
Newsprint	1,301	1.2
Corrugated Containers	3,793	3.5
Computer Paper	0	0.0
Office Paper	434	0.4
Mixed Waste Paper	3,468	3.2
Nonrecyclable Paper	1,951	1.8
<b>PLASTICS</b>		
PET Bottles	108	0.1
HDPE Bottles	108	0.1
Plastic Packaging	1,734	1.6
Other Plastic Products	1,301	1.2
Expanded Polystyrene	217	0.2
<b>RUBBER</b>		
Rubber Products	542	0.5
Tires	650	0.6
<b>ORGANIC</b>		
Food	3,685	3.4
Lawn and Garden Waste	33,489	30.9
Wood Waste	17,016	15.7
<b>OTHER</b>		
Disposable Diapers	217	0.2
Textiles	5,419	5.0
Leather	108	0.1
Inert Material and Fines	8,128	7.5
Ash	650	0.6
Construction Debris (other than wood)	6,394	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	434	0.4
Oil	108	0.1
Other Chemicals	759	0.7
Total	108,596	

FIGURE VI-7

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
South Central Waste Generation Area

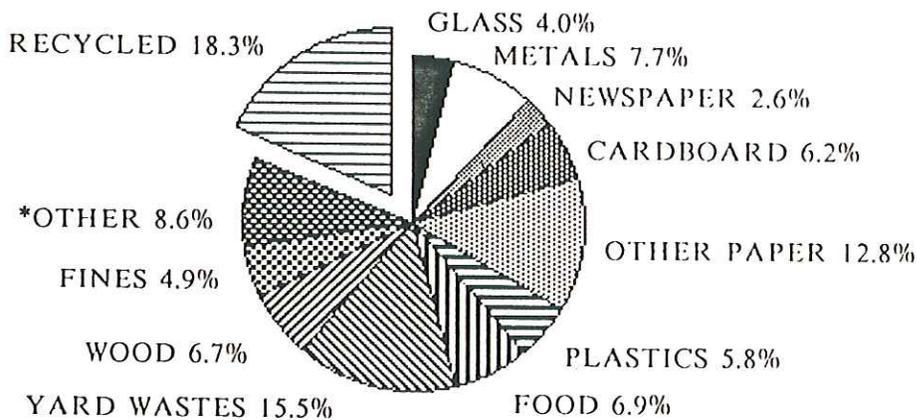
Substream Tonnages and Category Distribution Summary

TOTAL GENERATED TONS: 238,500



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



\*rubber, textiles, construction debris, hazardous, etc.

CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-31

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
 South Central Waste Generation Area  
 Total Waste Stream

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	1,634	0.84	Note 2		Note 2	N/A
Refillable Beer Bottles	434	0.22	1,100	71.70	1,534	0.64
Nonrefillable Soft Drink Bottles	1,224	0.63	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	0	0.00	300	99.84	300	0.13
Container Glass	4,887	2.50	900	10.41	8,645	3.63
Nonrecyclable Glass	1,370	0.70			1,370	0.57
<b>METAL</b>						
Aluminum Cans	918	0.47	700	43.27	1,618	0.68
Aluminum Containers	254	0.13	0	0.00	254	0.11
Tin Cans	2,644	1.36	0	0.00	2,644	1.11
Bi-Metal Cans	0	0.00	0	0.00	0	0.00
Mixed Metals/Materials	4,499	2.31			4,499	1.89
Ferrous Metals	7,669	3.93	19,000	71.24	26,669	11.18
White Goods	1,503	0.77	0	0.00	1,503	0.63
Nonferrous Metals	762	0.39	3,000	79.75	3,762	1.58
<b>PAPER</b>						
Newsprint	6,726	3.45	8,800	56.68	15,526	6.51
Corrugated Containers	14,878	7.63	7,300	32.91	22,178	9.30
Computer Paper	930	0.48	0	0.00	930	0.39
Office Paper	1,637	0.84	100	5.76	1,737	0.73
Mixed Waste Paper	18,561	9.51	0	0.00	18,561	7.78
Nonrecyclable Paper	9,365	4.80			9,365	3.93
<b>PLASTICS</b>						
PET Bottles	399	0.20	0	0.00	399	0.17
HDPE Bottles	468	0.24	0	0.00	468	0.20
Plastic Packaging	8,733	4.48			8,733	3.66
Other Plastic Products	2,978	1.53			2,978	1.25
Expanded Polystyrene	1,146	0.59			1,146	0.48
<b>RUBBER</b>						
Rubber Products	1,771	0.91			1,771	0.74
Tires	1,595	0.82	100	5.90	1,695	0.71
<b>ORGANIC</b>						
Food	16,496	8.45			16,496	6.92
Lawn and Garden Waste	36,947	18.94			36,947	15.49
Wood Waste	15,872	8.13			15,872	6.65
<b>OTHER</b>						
Disposable Diapers	2,475	1.27			2,475	1.04
Textiles	7,087	3.63			7,087	2.97
Leather	217	0.11			217	0.09
Inert Material and Fines	11,795	6.04			11,795	4.95
Ash	831	0.43			831	0.35
Construction Debris (other than wood)	4,867	2.49			4,867	2.04
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	345	0.18	900	72.28	1,245	0.52
Oil	223	0.11	1,200	84.32	1,423	0.60
Other Chemicals	983	0.50			983	0.41
<b>Total</b>	<b>195,125</b>		<b>43,400</b>		<b>238,525</b>	

<sup>1</sup>-Includes reported construction/demolition tonnage

<sup>2</sup>-Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-32

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**South Central Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	857	1.2
Refillable Beer Bottles	214	0.3
Nonrefillable Soft Drink Bottles	643	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	3,286	4.6
Nonrecyclable Glass	143	0.2
<b>METAL</b>		
Aluminum Cans	572	0.8
Aluminum Containers	143	0.2
Tin Cans	1,786	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	572	0.8
Ferrous Metals	429	0.6
White Goods	71	0.1
Nonferrous Metals	71	0.1
<b>PAPER</b>		
Newsprint	4,072	5.7
Corrugated Containers	3,429	4.8
Computer Paper	71	0.1
Office Paper	214	0.3
Mixed Waste Paper	10,001	14.0
Nonrecyclable Paper	4,001	5.6
<b>PLASTICS</b>		
PET Bottles	286	0.4
HDPE Bottles	357	0.5
Plastic Packaging	4,215	5.9
Other Plastic Products	572	0.8
Expanded Polystyrene	286	0.4
<b>RUBBER</b>		
Rubber Products	214	0.3
Tires	357	0.5
<b>ORGANIC</b>		
Food	7,787	10.9
Lawn and Garden Waste	15,931	22.3
Wood Waste	857	1.2
<b>OTHER</b>		
Disposable Diapers	2,286	3.2
Textiles	2,215	3.1
Leather	143	0.2
Inert Material and Fines	4,644	6.5
Ash	71	0.1
Construction Debris (other than wood)	429	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	71	0.1
Oil	143	0.2
Other Chemicals	71	0.1
<b>Total</b>	<b>71,510</b>	

TABLE VI-33

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
 South Central Waste Generation Area  
 Commercial/Institutional Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	370	0.7
Refillable Beer Bottles	95	0.2
Nonrefillable Soft Drink Bottles	390	0.7
Refillable Soft Drink Bottles	0	0.0
Container Glass	654	1.2
Nonrecyclable Glass	768	1.4
<b>METAL</b>		
Aluminum Cans	206	0.4
Aluminum Containers	105	0.2
Tin Cans	476	0.9
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,656	3.1
Ferrous Metals	4,015	7.6
White Goods	0	0.0
Nonferrous Metals	118	0.2
<b>PAPER</b>		
Newsprint	1,851	3.5
Corrugated Containers	8,511	16.0
Computer Paper	693	1.3
Office Paper	955	1.8
Mixed Waste Paper	6,116	11.5
Nonrecyclable Paper	3,718	7.0
<b>PLASTICS</b>		
PET Bottles	44	0.1
HDPE Bottles	9	0.0
Plastic Packaging	3,265	6.1
Other Plastic Products	1,177	2.2
Expanded Polystyrene	581	1.1
<b>RUBBER</b>		
Rubber Products	1,129	2.1
Tires	860	1.6
<b>ORGANIC</b>		
Food	6,285	11.8
Lawn and Garden Waste	1,711	3.2
Wood Waste	3,946	7.4
<b>OTHER</b>		
Disposable Diapers	65	0.1
Textiles	1,656	3.1
Leather	6	0.0
Inert Material and Fines	973	1.8
Ash	18	0.0
Construction Debris (other than wood)	595	1.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	25	0.0
Oil	17	0.0
Other Chemicals	98	0.2
Total	53,075	

TABLE VI-34

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**South Central Waste Generation Area**  
**Manufacturing Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	219	2.8
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	4	0.1
Refillable Soft Drink Bottles	0	0.0
Container Glass	12	0.2
Nonrecyclable Glass	85	1.1
<b>METAL</b>		
Aluminum Cans	16	0.2
Aluminum Containers	6	0.1
Tin Cans	9	0.1
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	30	0.4
Ferrous Metals	230	2.9
White Goods	0	0.0
Nonferrous Metals	12	0.2
<b>PAPER</b>		
Newsprint	55	0.7
Corrugated Containers	751	9.5
Computer Paper	166	2.1
Office Paper	218	2.8
Mixed Waste Paper	446	5.6
Nonrecyclable Paper	523	6.6
<b>PLASTICS</b>		
PET Bottles	7	0.1
HDPE Bottles	39	0.5
Plastic Packaging	252	3.2
Other Plastic Products	481	6.1
Expanded Polystyrene	153	1.9
<b>RUBBER</b>		
Rubber Products	116	1.5
Tires	4	0.1
<b>ORGANIC</b>		
Food	307	3.9
Lawn and Garden Waste	70	0.9
Wood Waste	1,251	15.8
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	102	1.3
Leather	6	0.1
Inert Material and Fines	1,473	18.5
Ash	368	4.6
Construction Debris (other than wood)	152	1.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	0	0.0
Oil	1	0.0
Other Chemicals	377	4.8
Total	7,943	

TABLE VI-35

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**South Central Waste Generation Area**  
**Self-haul Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	187	0.3
Refillable Beer Bottles	125	0.2
Nonrefillable Soft Drink Bottles	187	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	934	1.5
Nonrecyclable Glass	374	0.6
<b>METAL</b>		
Aluminum Cans	125	0.2
Aluminum Containers	0	0.0
Tin Cans	374	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	2,241	3.6
Ferrous Metals	2,988	4.8
White Goods	1,432	2.3
Nonferrous Metals	560	0.9
<b>PAPER</b>		
Newsprint	747	1.2
Corrugated Containers	2,179	3.5
Computer Paper	0	0.0
Office Paper	249	0.4
Mixed Waste Paper	1,992	3.2
Nonrecyclable Paper	1,121	1.8
<b>PLASTICS</b>		
PET Bottles	62	0.1
HDPE Bottles	62	0.1
Plastic Packaging	996	1.6
Other Plastic Products	747	1.2
Expanded Polystyrene	125	0.2
<b>RUBBER</b>		
Rubber Products	311	0.5
Tires	374	0.6
<b>ORGANIC</b>		
Food	2,117	3.4
Lawn and Garden Waste	19,235	30.9
Wood Waste	9,773	15.7
<b>OTHER</b>		
Disposable Diapers	125	0.2
Textiles	3,113	5.0
Leather	62	0.1
Inert Material and Fines	4,669	7.5
Ash	374	0.6
Construction Debris (other than wood)	3,673	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	249	0.4
Oil	62	0.1
Other Chemicals	436	0.7
Total	62,375	

FIGURE VI-8

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
Northeast Waste Generation Area

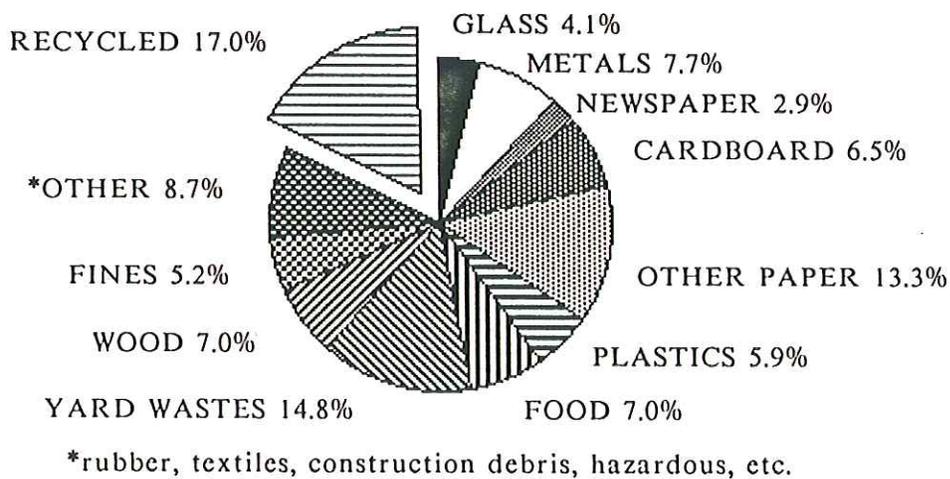
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 485,300



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-36

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
 Northeast Waste Generation Area  
 Total Waste Stream

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	3,242	0.80	Note 2		Note 2	N/A
Refillable Beer Bottles	909	0.23	1,000	52.37	1,909	0.39
Nonrefillable Soft Drink Bottles	2,544	0.63	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	3	0.00	0	0.00	3	0.00
Container Glass	10,107	2.51	1,500	8.62	17,393	3.58
Nonrecyclable Glass	2,895	0.72			2,895	0.60
<b>METAL</b>						
Aluminum Cans	1,906	0.47	2,900	60.34	4,806	0.99
Aluminum Containers	536	0.13	0	0.00	536	0.11
Tin Cans	5,506	1.37	0	0.00	5,506	1.13
Bi-Metal Cans	3	0.00	0	0.00	3	0.00
Mixed Metals/Materials	8,789	2.18			8,789	1.81
Ferrous Metals	16,284	4.04	26,700	62.12	42,984	8.86
White Goods	2,765	0.69	100	3.49	2,865	0.59
Nonferrous Metals	1,469	0.36	3,700	71.58	5,169	1.06
<b>PAPER</b>						
Newsprint	14,011	3.48	14,100	50.16	28,111	5.79
Corrugated Containers	31,329	7.77	23,300	42.66	54,629	11.25
Computer Paper	1,983	0.49	200	9.18	2,183	0.45
Office Paper	3,546	0.88	1,100	23.69	4,646	0.96
Mixed Waste Paper	39,147	9.71	1,400	3.46	40,547	8.35
Nonrecyclable Paper	19,882	4.93			19,882	4.10
<b>PLASTICS</b>						
PET Bottles	819	0.20	0	0.00	819	0.17
HDPE Bottles	942	0.23	0	0.00	942	0.19
Plastic Packaging	18,630	4.62			18,630	3.84
Other Plastic Products	5,930	1.47			5,930	1.22
Expanded Polystyrene	2,498	0.62			2,498	0.51
<b>RUBBER</b>						
Rubber Products	4,006	0.99			4,006	0.83
Tires	3,374	0.84	2,000	37.22	5,374	1.11
<b>ORGANIC</b>						
Food	34,093	8.46			34,093	7.02
Lawn and Garden Waste	72,009	17.86			72,009	14.84
Wood Waste	34,091	8.46			34,091	7.02
<b>OTHER</b>						
Disposable Diapers	5,179	1.28			5,179	1.07
Textiles	14,485	3.59			14,485	2.98
Leather	472	0.12			472	0.10
Inert Material and Fines	25,239	6.26			25,239	5.20
Ash	1,053	0.26			1,053	0.22
Construction Debris (other than wood)	10,685	2.65			10,685	2.20
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	662	0.16	1,500	69.39	2,162	0.45
Oil	471	0.12	2,800	85.60	3,271	0.67
Other Chemicals	1,585	0.39			1,585	0.33
<b>Total</b>	<b>403,078</b>		<b>82,300</b>		<b>485,378</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-37

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Northeast Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	1,803	1.2
Refillable Beer Bottles	451	0.3
Nonrefillable Soft Drink Bottles	1,352	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	6,911	4.6
Nonrecyclable Glass	300	0.2
<b>METAL</b>		
Aluminum Cans	1,202	0.8
Aluminum Containers	300	0.2
Tin Cans	3,756	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,202	0.8
Ferrous Metals	901	0.6
White Goods	150	0.1
Nonferrous Metals	150	0.1
<b>PAPER</b>		
Newsprint	8,563	5.7
Corrugated Containers	7,211	4.8
Computer Paper	150	0.1
Office Paper	451	0.3
Mixed Waste Paper	21,033	14.0
Nonrecyclable Paper	8,413	5.6
<b>PLASTICS</b>		
PET Bottles	601	0.4
HDPE Bottles	751	0.5
Plastic Packaging	8,864	5.9
Other Plastic Products	1,202	0.8
Expanded Polystyrene	601	0.4
<b>RUBBER</b>		
Rubber Products	451	0.3
Tires	751	0.5
<b>ORGANIC</b>		
Food	16,376	10.9
Lawn and Garden Waste	33,502	22.3
Wood Waste	1,803	1.2
<b>OTHER</b>		
Disposable Diapers	4,808	3.2
Textiles	4,657	3.1
Leather	300	0.2
Inert Material and Fines	9,765	6.5
Ash	150	0.1
Construction Debris (other than wood)	901	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	150	0.1
Oil	300	0.2
Other Chemicals	150	0.1
Total	150,385	

TABLE VI-38

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Northeast Waste Generation Area  
 Commercial/Institutional Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	810	0.7
Refillable Beer Bottles	211	0.2
Nonrefillable Soft Drink Bottles	813	0.7
Refillable Soft Drink Bottles	2	0.0
Container Glass	1,417	1.3
Nonrecyclable Glass	1,729	1.5
<b>METAL</b>		
Aluminum Cans	436	0.4
Aluminum Containers	212	0.2
Tin Cans	1,040	0.9
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	3,388	3.0
Ferrous Metals	8,434	7.5
White Goods	0	0.0
Nonferrous Metals	244	0.2
<b>PAPER</b>		
Newsprint	3,883	3.4
Corrugated Containers	18,056	16.0
Computer Paper	1,455	1.3
Office Paper	2,043	1.8
Mixed Waste Paper	12,689	11.2
Nonrecyclable Paper	8,005	7.1
<b>PLASTICS</b>		
PET Bottles	93	0.1
HDPE Bottles	20	0.0
Plastic Packaging	6,943	6.1
Other Plastic Products	2,519	2.2
Expanded Polystyrene	1,265	1.1
<b>RUBBER</b>		
Rubber Products	2,551	2.3
Tires	1,934	1.7
<b>ORGANIC</b>		
Food	13,466	11.9
Lawn and Garden Waste	3,397	3.0
Wood Waste	8,257	7.3
<b>OTHER</b>		
Disposable Diapers	145	0.1
Textiles	3,782	3.3
Leather	11	0.0
Inert Material and Fines	2,118	1.9
Ash	34	0.0
Construction Debris (other than wood)	1,299	1.1
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	57	0.1
Oil	53	0.0
Other Chemicals	203	0.2
Total	113,013	

TABLE VI-39

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Northeast Waste Generation Area**  
**Manufacturing Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	279	1.9
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	17	0.1
Refillable Soft Drink Bottles	2	0.0
Container Glass	49	0.3
Nonrecyclable Glass	186	1.2
<b>METAL</b>		
Aluminum Cans	31	0.2
Aluminum Containers	12	0.1
Tin Cans	31	0.2
Bi-Metal Cans	3	0.0
Mixed Metals/Materials	113	0.7
Ferrous Metals	952	6.2
White Goods	0	0.0
Nonferrous Metals	34	0.2
<b>PAPER</b>		
Newsprint	108	0.7
Corrugated Containers	1,504	9.8
Computer Paper	367	2.4
Office Paper	599	3.9
Mixed Waste Paper	1,413	9.2
Nonrecyclable Paper	1,199	7.8
<b>PLASTICS</b>		
PET Bottles	12	0.1
HDPE Bottles	57	0.4
Plastic Packaging	569	3.7
Other Plastic Products	775	5.0
Expanded Polystyrene	319	2.1
<b>RUBBER</b>		
Rubber Products	373	2.4
Tires	9	0.1
<b>ORGANIC</b>		
Food	402	2.6
Lawn and Garden Waste	131	0.9
Wood Waste	2,728	17.7
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	267	1.7
Leather	48	0.3
Inert Material and Fines	1,920	12.5
Ash	190	1.2
Construction Debris (other than wood)	301	2.0
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	2	0.0
Oil	5	0.0
Other Chemicals	407	2.6
Total	15,411	

TABLE VI-40

WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Northeast Waste Generation Area  
 Self-haul Waste Stream

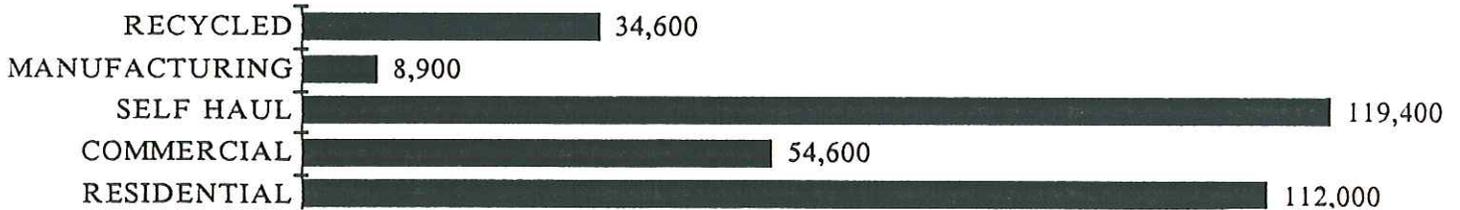
CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	340	0.3
Refillable Beer Bottles	226	0.2
Nonrefillable Soft Drink Bottles	340	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	1,698	1.5
Nonrecyclable Glass	679	0.6
<b>METAL</b>		
Aluminum Cans	226	0.2
Aluminum Containers	0	0.0
Tin Cans	679	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	4,075	3.6
Ferrous Metals	5,434	4.8
White Goods	2,604	2.3
Nonferrous Metals	1,019	0.9
<b>PAPER</b>		
Newsprint	1,358	1.2
Corrugated Containers	3,962	3.5
Computer Paper	0	0.0
Office Paper	453	0.4
Mixed Waste Paper	3,622	3.2
Nonrecyclable Paper	2,038	1.8
<b>PLASTICS</b>		
PET Bottles	113	0.1
HDPE Bottles	113	0.1
Plastic Packaging	1,811	1.6
Other Plastic Products	1,358	1.2
Expanded Polystyrene	226	0.2
<b>RUBBER</b>		
Rubber Products	566	0.5
Tires	679	0.6
<b>ORGANIC</b>		
Food	3,849	3.4
Lawn and Garden Waste	34,979	30.9
Wood Waste	17,772	15.7
<b>OTHER</b>		
Disposable Diapers	226	0.2
Textiles	5,660	5.0
Leather	113	0.1
Inert Material and Fines	8,490	7.5
Ash	679	0.6
Construction Debris (other than wood))	6,679	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	453	0.4
Oil	113	0.1
Other Chemicals	792	0.7
Total	113,426	

FIGURE VI-9

WASHINGTON DEPARTMENT OF ECOLOGY  
Recycling and Waste Stream Survey  
Southeast Waste Generation Area

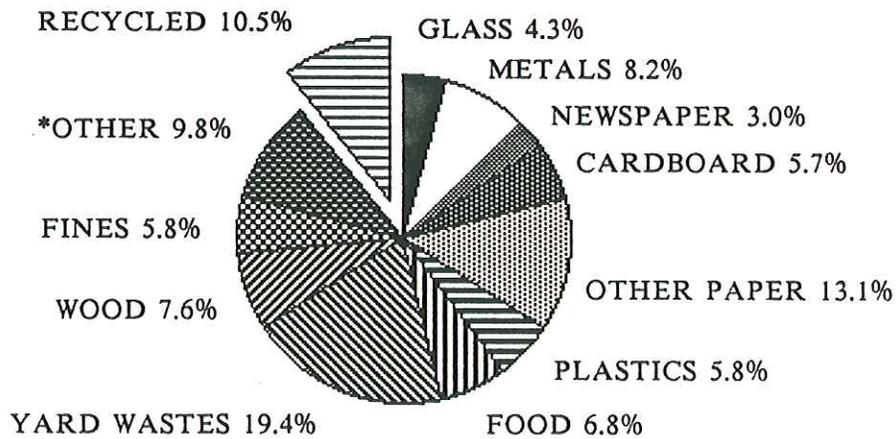
Substream Tonnages and Category Distribution Summary  
Recycled and Disposed

TOTAL GENERATED TONS: 329,500



(Commercial includes reported construction/demolition tonnage)

SUBSTREAM TONNAGES



\*rubber, textiles, construction debris, hazardous, etc.

CATEGORY DISTRIBUTION BY WEIGHT

TABLE VI-41

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Southeast Waste Generation Area**  
**Total Waste Stream**

CATEGORIES	DISPOSED <sup>1</sup>		RECYCLED		GENERATED	
	Total Tons	% Of Total Disposed	Total Tons	% Of Category Generated	Total Tons	% Of Total Generated
<b>GLASS</b>						
Nonrefillable Beer Bottles	2,098	0.71	Note 2		Note 2	N/A
Refillable Beer Bottles	677	0.23	800	54.15	1,477	0.45
Nonrefillable Soft Drink Bottles	1,762	0.60	Note 2		Note 2	N/A
Refillable Soft Drink Bottles	0	0.00	400	100.0	400	0.12
Container Glass	7,627	2.59	2,200	16.07	13,687	4.15
Nonrecyclable Glass	1,995	0.68			1,995	0.61
<b>METAL</b>						
Aluminum Cans	1,368	0.46	1,500	52.29	2,868	0.87
Aluminum Containers	339	0.12	0	0.00	339	0.10
Tin Cans	4,015	1.36	200	4.75	4,215	1.28
Bi-Metal Cans	0	0.00	0	0.00	0	0.00
Mixed Metals/Materials	6,911	2.34			6,911	2.10
Ferrous Metals	10,329	3.50	14,600	58.57	24,929	7.56
White Goods	2,853	0.97	100	3.39	2,953	0.90
Nonferrous Metals	1,318	0.45	2,700	67.20	4,018	1.22
<b>PAPER</b>						
Newsprint	9,866	3.35	1,400	12.43	11,266	3.42
Corrugated Containers	18,875	6.40	6,700	26.20	25,575	7.76
Computer Paper	1,063	0.36	200	15.84	1,263	0.38
Office Paper	2,295	0.78	100	4.18	2,395	0.73
Mixed Waste Paper	26,748	9.07	100	0.37	26,848	8.15
Nonrecyclable Paper	13,031	4.42			13,031	3.95
<b>PLASTICS</b>						
PET Bottles	613	0.21	0	0.00	613	0.19
HDPE Bottles	752	0.25	0	0.00	752	0.23
Plastic Packaging	12,454	4.22			12,454	3.78
Other Plastic Products	3,875	1.31			3,875	1.18
Expanded Polystyrene	1,325	0.45			1,325	0.40
<b>RUBBER</b>						
Rubber Products	2,356	0.80			2,356	0.71
Tires	2,321	0.79	200	7.93	2,521	0.76
<b>ORGANIC</b>						
Food	22,440	7.61			22,440	6.81
Lawn and Garden Waste	63,863	21.66			63,863	19.38
Wood Waste	25,061	8.50			25,061	7.60
<b>OTHER</b>						
Disposable Diapers	3,892	1.32			3,892	1.18
Textiles	11,389	3.86			11,389	3.46
Leather	355	0.12			355	0.11
Inert Material and Fines	18,985	6.44			18,985	5.76
Ash	1,246	0.42			1,246	0.38
Construction Debris (other than wood)	8,517	2.89			8,517	2.58
<b>HOUSEHOLD HAZARDOUS</b>						
Batteries	619	0.21	700	53.08	1,319	0.40
Oil	361	0.12	2,700	88.20	3,061	0.93
Other Chemicals	1,276	0.43			1,276	0.39
<b>Total</b>	<b>294,869</b>		<b>34,600</b>		<b>329,469</b>	

<sup>1</sup>Includes reported construction/demolition tonnage

<sup>2</sup>Recycling figures for Nonrefillable beer and soft drink bottles are included in the container glass category.

TABLE VI-42

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Southeast Waste Generation Area**  
**Residential Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	1,343	1.2
Refillable Beer Bottles	336	0.3
Nonrefillable Soft Drink Bottles	1,007	0.9
Refillable Soft Drink Bottles	0	0.0
Container Glass	5,147	4.6
Nonrecyclable Glass	224	0.2
<b>METAL</b>		
Aluminum Cans	895	0.8
Aluminum Containers	224	0.2
Tin Cans	2,797	2.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	895	0.8
Ferrous Metals	671	0.6
White Goods	112	0.1
Nonferrous Metals	112	0.1
<b>PAPER</b>		
Newsprint	6,378	5.7
Corrugated Containers	5,371	4.8
Computer Paper	112	0.1
Office Paper	336	0.3
Mixed Waste Paper	15,665	14.0
Nonrecyclable Paper	6,266	5.6
<b>PLASTICS</b>		
PET Bottles	448	0.4
HDPE Bottles	559	0.5
Plastic Packaging	6,602	5.9
Other Plastic Products	895	0.8
Expanded Polystyrene	448	0.4
<b>RUBBER</b>		
Rubber Products	336	0.3
Tires	559	0.5
<b>ORGANIC</b>		
Food	12,196	10.9
Lawn and Garden Waste	24,952	22.3
Wood Waste	1,343	1.2
<b>OTHER</b>		
Disposable Diapers	3,581	3.2
Textiles	3,469	3.1
Leather	224	0.2
Inert Material and Fines	7,273	6.5
Ash	112	0.1
Construction Debris (other than wood)	671	0.6
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	112	0.1
Oil	224	0.2
Other Chemicals	112	0.1
Total	112,006	

TABLE VI-43

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**Recycling and Waste Stream Survey**  
**Southeast Waste Generation Area**  
**Commercial/Institutional Waste Stream**

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	374	0.7
Refillable Beer Bottles	103	0.2
Nonrefillable Soft Drink Bottles	395	0.7
Refillable Soft Drink Bottles	0	0.0
Container Glass	636	1.2
Nonrecyclable Glass	908	1.7
<b>METAL</b>		
Aluminum Cans	220	0.4
Aluminum Containers	106	0.2
Tin Cans	460	0.8
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	1,667	3.1
Ferrous Metals	3,804	7.0
White Goods	0	0.0
Nonferrous Metals	112	0.2
<b>PAPER</b>		
Newsprint	1,975	3.6
Corrugated Containers	8,279	15.2
Computer Paper	766	1.4
Office Paper	1,118	2.1
Mixed Waste Paper	6,521	12.0
Nonrecyclable Paper	3,763	6.9
<b>PLASTICS</b>		
PET Bottles	46	0.1
HDPE Bottles	8	0.0
Plastic Packaging	3,140	5.8
Other Plastic Products	1,159	2.1
Expanded Polystyrene	551	1.0
<b>RUBBER</b>		
Rubber Products	1,306	2.4
Tires	1,046	1.9
<b>ORGANIC</b>		
Food	6,012	11.1
Lawn and Garden Waste	1,948	3.6
Wood Waste	4,111	7.6
<b>OTHER</b>		
Disposable Diapers	73	0.1
Textiles	1,907	3.5
Leather	7	0.0
Inert Material and Fines	1,036	1.9
Ash	23	0.0
Construction Debris (other than wood)	675	1.2
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	30	0.1
Oil	17	0.0
Other Chemicals	91	0.2
Total	54,395	

TABLE VI-44  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
Southeast Waste Generation Area  
 Manufacturing Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	24	0.3
Refillable Beer Bottles	0	0.0
Nonrefillable Soft Drink Bottles	3	0.0
Refillable Soft Drink Bottles	0	0.0
Container Glass	55	0.6
Nonrecyclable Glass	148	1.7
<b>METAL</b>		
Aluminum Cans	15	0.2
Aluminum Containers	9	0.1
Tin Cans	43	0.5
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	58	0.7
Ferrous Metals	122	1.4
White Goods	0	0.0
Nonferrous Metals	20	0.2
<b>PAPER</b>		
Newsprint	82	0.9
Corrugated Containers	1,044	11.8
Computer Paper	184	2.1
Office Paper	364	4.1
Mixed Waste Paper	741	8.4
Nonrecyclable Paper	853	9.6
<b>PLASTICS</b>		
PET Bottles	0	0.0
HDPE Bottles	65	0.7
Plastic Packaging	798	9.0
Other Plastic Products	389	4.4
Expanded Polystyrene	87	1.0
<b>RUBBER</b>		
Rubber Products	118	1.3
Tires	1	0.0
<b>ORGANIC</b>		
Food	179	2.0
Lawn and Garden Waste	135	1.5
Wood Waste	833	9.4
<b>OTHER</b>		
Disposable Diapers	0	0.0
Textiles	52	0.6
Leather	4	0.1
Inert Material and Fines	1,686	19.0
Ash	397	4.5
Construction Debris (other than wood)	112	1.3
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	0	0.0
Oil	1	0.0
Other Chemicals	237	2.7
<b>Total</b>	<b>8,857</b>	

TABLE VI-45  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey  
Southeast Waste Generation Area  
 Self-haul Waste Stream

CATEGORIES	TONS	% BY WEIGHT
<b>GLASS</b>		
Nonrefillable Beer Bottles	358	0.3
Refillable Beer Bottles	238	0.2
Nonrefillable Soft Drink Bottles	358	0.3
Refillable Soft Drink Bottles	0	0.0
Container Glass	1,788	1.5
Nonrecyclable Glass	715	0.6
<b>METAL</b>		
Aluminum Cans	238	0.2
Aluminum Containers	0	0.0
Tin Cans	715	0.6
Bi-Metal Cans	0	0.0
Mixed Metals/Materials	4,291	3.6
Ferrous Metals	5,721	4.8
White Goods	2,741	2.3
Nonferrous Metals	1,073	0.9
<b>PAPER</b>		
Newsprint	1,430	1.2
Corrugated Containers	4,171	3.5
Computer Paper	0	0.0
Office Paper	477	0.4
Mixed Waste Paper	3,814	3.2
Nonrecyclable Paper	2,145	1.8
<b>PLASTICS</b>		
PET Bottles	119	0.1
HDPE Bottles	119	0.1
Plastic Packaging	1,907	1.6
Other Plastic Products	1,430	1.2
Expanded Polystyrene	238	0.2
<b>RUBBER</b>		
Rubber Products	596	0.5
Tires	715	0.6
<b>ORGANIC</b>		
Food	4,052	3.4
Lawn and Garden Waste	36,828	30.9
Wood Waste	18,712	15.7
<b>OTHER</b>		
Disposable Diapers	238	0.2
Textiles	5,959	5.0
Leather	119	0.1
Inert Material and Fines	8,939	7.5
Ash	715	0.6
Construction Debris (other than wood)	7,032	5.9
<b>HOUSEHOLD HAZARDOUS</b>		
Batteries	477	0.4
Oil	119	0.1
Other Chemicals	834	0.7
Total	119,422	

## SECTION VII

### COMPARISON OF PRIMARY AND SECONDARY DATA SOURCES FOR WASTE STREAM VOLUMES

#### 1. POTENTIALLY AVAILABLE AMOUNTS

Table VII-1 displays the estimated tonnages available in Washington State during 1987 for each potentially recyclable material covered in the WGA recycling study. It is important to note that there were too few refillable soft drink bottles and bi-metal cans to generate meaningful numbers for potentially available tonnages. Care was taken to find the best sources of secondary data on tons available (See footnotes).

#### 2. RECYCLED AND DISPOSED AMOUNTS COMPARED TO POTENTIALLY AVAILABLE AMOUNTS

Tables VII-2 through -10 compare estimated recycled and disposed amounts to potentially available amounts for each category in the State as a whole and within each WGA.

The estimated recycled tonnage figures were derived from the recycling survey, described in Section V. The disposed tonnage figures were generated from the individual waste substream category tonnages for each WGA, described in Section VI. The estimated available tonnages were calculated for each WGA using estimated 1987 WGA populations in proportion to the estimated 1987 State population.

TABLE VII-1  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 POTENTIALLY AVAILABLE AMOUNTS OF RECYCLABLE MATERIALS - 1987  
 - Estimated by Secondary Sources -

<u>Category</u>	<u>Estimated Tons</u>
Refillable beer bottles	32,852 <sup>1</sup>
Refillable soft drink bottles	N/A <sup>2</sup>
Container glass	186,887 <sup>3</sup>
Newsprint	269,671 <sup>4</sup>
Corrugated containers	451,761 <sup>5</sup>
Computer paper	37,587 <sup>6</sup>
Office paper	83,129 <sup>7</sup>
Mixed waste paper	502,332 <sup>8</sup>
Aluminum cans	22,953 <sup>9</sup>
Aluminum containers	4,175 <sup>10</sup>
Tin cans	43,040 <sup>11</sup>
Bi-metal cans	N/A <sup>12</sup>
Ferrous metals	N/A <sup>13</sup>
Nonferrous metals	N/A <sup>14</sup>
White goods	47,733 <sup>15</sup>
Batteries (lead-acid type)	22,331 <sup>16</sup>
Tires	36,590 <sup>17</sup>
PET bottles	5,727 <sup>18</sup>
HDPE bottles	16,115 <sup>19</sup>
Oil	139,670 <sup>20</sup>

FOOTNOTES

1. Refillable beer bottles. Derived from beer sales information provided by the Washington State Liquor Control Board. The reported number of gallons of beer sold in the State in 1987 was multiplied by 15%--the estimated proportion of beer volume sold in refillable bottles in Washington (Beer Institute information). The average bottle size used was twelve ounces; the conversion used was 146 cases (24 bottles per case) per ton (Characterization of Municipal Solid Waste in the U.S., 1960 to 2000, Working Papers, 1986. Franklin Assoc., Ltd., Prairie Village, Kansas, p. I-3). The tonnage estimate based on gallons in refillable bottles was reduced by the estimated portion that had been filled more than once in 1987. It was estimated that a refillable bottle was filled three times within a year.
2. Refillable soft drink bottles. No reliable data could be found on refillable pop bottles available in the State. Therefore, the estimate used is simply the total of reported bottles

refilled and the estimated waste-stream amounts. Since the sampling error was so small for refillable pop bottles, the waste-stream sampling likely represents a fairly accurate measure. The conversion factor used was 90 cases per ton (same source as Footnote 1).

3. Container glass. U.S. Department of Commerce, Bureau of the Census. Current Industrial Reports, Glass Containers, 1987; M32G(87)-13. Issued May, 1988. Data were taken from Table 4: all containers less refillable beverage and beer bottles.
4. Newsprint. U.S. Department of Commerce, Bureau of the Census. Current Business Reports, Pulp, Paper, and Board, 1987; MA26A(87)-1. Issued November, 1988. Data used were "apparent consumption," Table 16 (Product code 26211, Newsprint), extrapolated on a per-capita basis from U.S. figures. "Apparent consumption" takes into account imports and exports of paper. The 1987 national and state population estimates are from the U.S. Department of Commerce, Bureau of the Census, Current Population Report, 1988, p. 25.
5. Corrugated containers. Ibid. ("Apparent consumption" from Table 16 for product codes 25217, unbleached kraft packaging and industrial converting paper; 26311, unbleached kraft packaging and industrial converting paperboard; 26313, semichemical paperboard).
6. Computer paper. Ibid. (Product code 26214-32, form bond; taken from Table 8).
7. Office paper. Ibid. (Product codes 26214, uncoated free sheet; 26216, cotton fiber writing paper and thin paper). Tonnage of paper products not likely to be for office use was removed from code 26214 figures. Categories removed from code 26214 were form bond (26214-32, see footnote 6), tablet (26214-47), fine writing paper (26214-49), publication and printing paper (26214-44 through 26214-46), cover and text papers (26214-60), envelope (26214-71 and 26214-73), and coding stock (26214-89). Figures on product code 26214 were taken from "shipments" (Table 8); product code 26216 figures were from "apparent consumption" (Table 16).
8. Mixed waste paper. Ibid. ("Apparent consumption" figures for product code 26212, groundwood paper uncoated; 26213, clay coated printing and converting paper; 26215, bleached bristols; 26218, packaging and industrial converting paper; 26219, special industrial paper; 2621A, tissue and papermill products; 26312, bleached packaging and converting paperboard; plus those categories of product code 26214 mentioned in Footnote 7).
9. Aluminum cans. Combination of figures on aluminum beer cans and aluminum pop cans. Beer-can figure derived from 1987 beer sales

volume multiplied by 49%--the estimated proportion of beer volume sold in aluminum cans (see Footnote 1). Pop-can figure derived from information provided by the Washington Soft Drink Association. The average can size used was twelve ounces. The figure for average number of cans manufactured per pound of aluminum sheet was 27.4 (provided in conversations with the American National Can Corporation).

10. Aluminum containers. Extrapolated from data on U.S. shipments of household and industrial wrap and semirigid containers provided by the Aluminum Association, Washington, D.C.
11. Tin cans. Correspondence and/or conversations with U.S. Steel, Pittsburgh, Pennsylvania; July, 1988. Assumptions were that the average weight for a "base box" of steel cans was 85 pounds (these base boxes of steel cans are plated by tin mills to create tin cans). Figure shown was extrapolated from national shipment data.
12. Bi-metal cans. Ibid. It was reported that no breweries nor soft-drink bottlers are known now to be using bi-metal cans in or near the State of Washington.
13. Ferrous metals. Due to the long lifetime of many products made with ferrous and nonferrous metals, it is very difficult to estimate the amounts available in Washington, especially the amounts discarded in 1987. Therefore, no estimates are shown. Extensive searches were conducted to establish at least a range of estimates, but none of the experts at the U.S. Department of the Interior could suggest appropriate methodologies.
14. Nonferrous metals. See Footnote 13.
15. White goods. Appliance, September 1988; "Life Expectancy/Replacement Picture" table; figures on "Units to be Replaced" in 1988 for ranges, refrigerators, washers, dryers, trash compactors, dishwashers, food disposers, freezers, and water heaters (microwave ovens were omitted because of their higher nonmetal content). Received information on average appliance weights from conversations with representatives of the Association of Home Appliance Manufacturers, Chicago, Illinois, as well as representatives of Sears, Inc., Seattle, Washington. This figure is probably an overestimate of the amounts potentially available for recycling because it assumes that every replaced appliance is discarded.
16. Batteries (lead-acid type). Conversations with the Battery Council International, July, 1988. Extrapolated from national "replacement shipment" figures. This assumes that for every battery replaced, one is discarded.

17. Tires. Modern Tire Dealer, January 1988, p. 43, "Estimated 1987 U.S. Tire Shipments" table. Extrapolated from national "replacement shipment" figures for passenger, truck, farm vehicle, and "other" tires. Retreading was not taken into account because it was considered insignificant (conversations with Washington State Department of Ecology, July 1988).
18. PET bottles. U.S. Department of Commerce, Bureau of the Census. Current Industrial Reports, Plastic Bottles, 1987; MA30E(87)-1, Table 3. Extrapolated from national figures on the weight of resin consumed in the production of polyethylene terephthalate (PET) plastic bottles.
19. HDPE bottles. Ibid. Extrapolated from national figures on the weight of resin consumed in the production of high-density polyethylene (HDPE) plastic bottles.
20. Oil. U.S. Department of Commerce, Bureau of the Census. Business Statistics, Annual, 1961-1988, "Petroleum and Products" table. Extrapolated from figures for "domestic product demand," which take into account imports and exports. Assumed that 55.5% of total petroleum lubricants were automotive (conversation with the National Petroleum Refiners Association).

TABLE VII-2  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 Statewide  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	19,000	9,467	28,467	32,852	4,385	13.3 <sup>1</sup>
Refillable soft drink bottles	1,700	24	1,724	N/A	N/A	N/A <sup>2</sup>
Container glass	22,300	174,592	196,892	186,887	-10,005	-5.4 <sup>3</sup>
Newsprint	166,600	153,416	320,016	269,671	-50,346	-18.7 <sup>4</sup>
Corrugated containers	287,600	311,227	598,827	451,761	-147,066	-32.6 <sup>5</sup>
Computer paper	16,100	20,884	36,984	37,587	603	1.6 <sup>6</sup>
Office paper	32,900	36,333	69,233	83,129	13,896	16.7 <sup>7</sup>
Mixed waste paper	34,100	425,204	459,304	502,332	43,038	8.6 <sup>8</sup>
Aluminum cans	10,800	21,042	31,842	22,953	-8,889	-38.7 <sup>9</sup>
Aluminum containers	0	5,718	5,718	4,175	-1,543	-37.0 <sup>10</sup>
Tin cans	800	61,175	61,975	43,040	-18,935	-44.0 <sup>11</sup>
Bi-metal cans	0	24	24	N/A	N/A	N/A <sup>12</sup>
Ferrous metals	423,800	142,288	566,088	N/A	N/A	N/A <sup>13</sup>
Nonferrous metals	46,600	13,344	59,944	N/A	N/A	N/A <sup>14</sup>
White goods	24,800	23,986	48,786	47,733	-1,053	-2.2 <sup>15</sup>
Batteries	22,100	6,261	28,361	22,331	-6,030	-27.0 <sup>16</sup>
Tires	10,300	33,957	44,257	36,590	-7,667	-21.0 <sup>17</sup>
PET bottles	0	9,233	9,233	5,727	-3,506	-61.2 <sup>18</sup>
HDPE bottles	1,700	11,687	13,386	16,115	2,729	16.9 <sup>19</sup>
Oil	<u>56,200</u>	<u>5,119</u>	<u>61,319</u>	139,670	78,351	56.1 <sup>20</sup>
<b>TOTAL</b>	<b>1,177,400</b>	<b>1,464,971</b>	<b>2,642,370</b>			

TABLE VII-2

FOOTNOTES

1. Refillable beer bottles. The residual may be due to sampling error or to refillable beer bottles in the environment and in inventory.
2. Refillable soft drink bottles. No residual could be calculated due to lack of information on the estimated available tonnage (See footnotes to Table VII-1).
3. Container glass. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by food contamination.
4. Newsprint. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by moisture contamination. A recent study concluded that 10% to 15% of the weight of newsprint as sampled in the waste stream was due to increased moisture content.
5. Corrugated containers. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by moisture contamination (See footnote 4). Also, the estimated available figure may be low due to lack of information on the contribution of corrugated from imported product packaging. The latest data on imports of goods likely to be shipped in corrugated containers indicates that this source of used corrugated may be significant. Although estimated tonnages of corrugated from imported packaging could not be calculated, one indicator of its possible impact is the fact that, in 1982 (latest available data), 50% of the new U.S. supply of radios, television sets, and sound equipment was imported. (U.S. Department of Commerce, Bureau of the Census. U.S. Commodity Exports and Imports as Related to Output, 1982 and 1981. Table 1B, pp 7-11).
6. Computer paper. The residual may be due to sampling error or to computer paper in libraries and in inventory.
7. Office paper. The residual may be due to sampling error or to office paper in libraries and in inventory.
8. Mixed waste paper. The residual may be due to sampling error or to mixed waste paper in the environment and in inventory.
9. Aluminum cans. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by contamination. An informal test in which 180 aluminum beverage cans from the waste stream were weighed, came up with 9.3 pounds of material. According to current U.S. industry standards for aluminum can production (27 cans from 1 pound of aluminum), 180 cans should

weigh 6.7 pounds. This suggests that about 39% of the weight of these cans from the waste stream was due to contamination. Although these findings are not statistically significant, they do give some indication of the extent to which waste stream contamination adds to the weight of aluminum cans.

Also, a small part of the residual may be due to recovery of aluminum cans from the waste stream after field sampling occurred. Removal of aluminum cans from a disposal site would, in essence, cause them to be "double counted"—once as a part of disposed tonnage and, again, as part of recycled tonnage. This practice was witnessed on several occasions, but no estimate is available regarding its effect on the estimated disposed tons.

10. Aluminum containers. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by food contamination.
11. Tin cans. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by food contamination.
12. Bi-metal cans. No residual could be calculated due to lack of information on the estimated available tonnage (See footnotes to Table VII-1).
13. Ferrous metals. No residual could be calculated due to lack of information on the estimated available tonnage (See footnotes to Table VII-1).
14. Nonferrous metals. No residual could be calculated due to lack of information on the estimated available tonnage (See footnotes to Table VII-1).
15. White goods. The residual may be due to sampling error.
16. Batteries (lead-acid type). The residual may be due to sampling error or to the fact that the estimated available tonnage figure includes only lead-acid vehicle batteries, whereas the estimated disposal figure includes both vehicle and household dry-cell batteries. No estimate was available for the proportion of the batteries in the waste stream which were lead-acid versus dry-cell type.
17. Tires. The residual may be due to sampling error or to the fact that the estimated available tonnage figure includes only passenger, truck, and farm vehicle tires. Other types of tires were included in sampling.
18. PET bottles. The residual may be due to sampling error or to the overestimation of disposed tonnage because of weight added by food contamination.

19. HDPE bottles. The residual may be due to sampling error or to HDPE plastic bottles in the environment and in inventory.
20. Oil. The residual may be due to sampling error or to the underestimation of disposed tonnage because of the difficulty of separating oil from material it contaminated. Also, promiscuous dumping of used oil may explain its lack of evidence in the waste stream.

TABLE VII-3  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 West Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	900	417	1,317	1,376	59	4.3
Refillable soft drink bottles	0	6	6	N/A	N/A	N/A
Container glass	600	8,033	8,633	7,831	-802	-10.3
Newsprint	2,500	6,108	8,608	11,299	2,691	23.8
Corrugated containers	2,500	19,076	21,576	18,929	-2,647	-14.0
Computer paper	0	1,768	1,768	1,575	-193	-12.2
Office paper	0	2,747	2,747	3,483	736	21.1
Mixed waste paper	0	17,512	17,512	21,048	3,536	16.8
Aluminum cans	300	847	1,147	962	-185	-19.2
Aluminum containers	0	250	250	175	-75	-43.0
Tin cans	0	2,311	2,311	1,803	-508	-28.2
Bi-metal cans	0	0	0	N/A	N/A	N/A
Ferrous metals	9,200	9,569	18,769	N/A	N/A	N/A
Nonferrous metals	1,000	942	1,942	N/A	N/A	N/A
White goods	100	1,958	2,058	2,000	-58	-2.9
Batteries	300	405	705	936	231	24.7
Tires	0	1,795	1,795	1,533	-262	-17.1
PET bottles	0	305	305	240	-65	-27.1
HDPE bottles	0	521	521	675	155	23.0
Oil	<u>1,200</u>	<u>192</u>	<u>1,392</u>	5,852	4,460	76.2
<b>TOTAL</b>	<b>18,600</b>	<b>74,761</b>	<b>93,361</b>			

TABLE VII-4  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 Northwest Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	1,100	492	1,592	1,817	225	12.4
Refillable soft drink bottles	0	0	0	N/A	N/A	N/A
Container glass	400	6,286	9,678	10,078	257	2.5
Newsprint	2,800	8,426	11,226	14,913	3,687	24.7
Corrugated containers	2,800	15,121	17,921	24,982	7,061	28.3
Computer paper	100	953	1,053	2,078	1,025	49.3
Office paper	200	1,608	1,808	4,597	2,789	60.7
Mixed waste paper	200	22,431	22,631	27,779	5,148	18.5
Aluminum cans	700	1,163	1,863	1,269	-594	-46.8
Aluminum containers	0	323	323	231	-92	-39.9
Tin cans	100	3,530	3,630	2,380	-1,250	-52.5
Bi-metal cans	0	11	11	N/A	N/A	N/A
Ferrous metals	34,000	5,938	39,938	N/A	N/A	N/A
Nonferrous metals	800	553	1,353	N/A	N/A	N/A
White goods	200	961	1,161	2,640	1,479	56.0
Batteries	1,500	280	1,780	1,235	-545	-44.1
Tires	0	1,522	1,522	2,023	501	24.8
PET bottles	0	520	520	317	-203	-64.0
HDPE bottles	0	652	652	891	239	26.9
Oil	<u>800</u>	<u>275</u>	<u>1,075</u>	7,724	6,649	86.1
<b>TOTAL</b>	<b>45,700</b>	<b>74,437</b>	<b>120,137</b>			

TABLE VII-5  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
Puget Sound Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	12,000	5,500	17,500	19,284	1,784	9.3
Refillable soft drink bottles	700	12	712	N/A	N/A	N/A
Container glass	15,400	102,737	118,137	109,703	-8,434	-7.7
Newsprint	127,900	92,183	220,083	158,297	-61,786	-39.0
Corrugated containers	235,900	178,575	414,475	265,184	-149,291	-56.3
Computer paper	14,400	11,720	26,120	22,064	-4,056	-18.4
Office paper	30,500	20,540	51,040	48,797	-2,243	-4.6
Mixed waste paper	28,900	257,766	286,666	294,867	8,201	2.8
Aluminum cans	3,700	12,592	16,292	13,473	-2,819	-20.9
Aluminum containers	0	3,414	3,414	2,451	-963	-39.3
Tin cans	500	36,653	37,153	25,264	-11,889	-47.1
Bi-metal cans	0	10	10	N/A	N/A	N/A
Ferrous metals	243,200	76,918	320,118	N/A	N/A	N/A
Nonferrous metals	33,300	6,544	39,844	N/A	N/A	N/A
White goods	24,300	10,287	34,587	28,019	-6,568	-23.4
Batteries	15,000	3,117	18,117	13,108	-5,009	-38.2
Tires	7,500	20,143	27,643	21,478	-6,165	-28.7
PET bottles	0	5,588	5,588	3,362	-2,226	-66.2
HDPE bottles	0	6,969	6,969	9,460	2,491	26.3
Oil	<u>39,500</u>	<u>3,024</u>	<u>42,524</u>	81,987	39,463	48.1
<b>TOTAL</b>	<b>832,700</b>	<b>854,291</b>	<b>1,686,991</b>			

TABLE VII-6  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 Southwest Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	1,000	591	1,591	2,621	1,030	39.3
Refillable soft drink bottles	0	1	1	N/A	N/A	N/A
Container glass	1,200	11,876	13,076	14,914	1,838	12.3
Newsprint	7,500	10,303	17,803	21,520	3,717	17.3
Corrugated containers	7,000	21,130	28,130	36,051	7,921	22.0
Computer paper	1,200	1,907	3,107	2,999	-108	-3.6
Office paper	900	2,686	3,586	6,634	3,048	45.9
Mixed waste paper	3,500	27,385	30,885	40,086	9,201	23.0
Aluminum cans	600	1,436	2,036	1,832	-204	-11.2
Aluminum containers	0	416	416	333	-83	-24.9
Tin cans	0	4,119	4,119	3,435	-684	-19.9
Bi-metal cans	0	0	0	N/A	N/A	N/A
Ferrous metals	62,400	7,359	69,759	N/A	N/A	N/A
Nonferrous metals	1,500	644	2,144	N/A	N/A	N/A
White goods	0	1,106	1,106	3,809	2,703	71.0
Batteries	1,800	329	2,129	1,782	-347	-19.5
Tires	500	1,807	2,307	2,920	613	21.0
PET bottles	0	620	620	457	-163	-35.7
HDPE bottles	1,700	965	2,665	1,286	-1,379	-107.2
Oil	<u>7,500</u>	<u>334</u>	<u>7,834</u>	11,146	3,312	29.7
<b>TOTAL</b>	<b>98,200</b>	<b>95,014</b>	<b>193,214</b>			

TABLE VII-7  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 North Central Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	1,100	446	1,546	1,143	-403	-35.3
Refillable soft drink bottles	300	0	300	N/A	N/A	N/A
Container glass	100	7,143	7,243	6,504	-739	-11.4
Newsprint	1,600	5,794	7,394	9,385	1,991	21.2
Corrugated containers	2,100	12,243	14,343	15,721	1,378	8.8
Computer paper	0	562	562	1,308	746	57.1
Office paper	0	1,267	1,267	2,893	1,626	56.2
Mixed waste paper	0	15,682	15,682	17,481	1,799	10.3
Aluminum cans	400	811	1,211	799	-412	-51.6
Aluminum containers	0	186	186	145	-41	-28.3
Tin cans	0	2,396	2,396	1,498	-898	-59.9
Bi-metal cans	0	0	0	N/A	N/A	N/A
Ferrous metals	14,700	8,216	22,916	N/A	N/A	N/A
Nonferrous metals	600	1,111	1,711	N/A	N/A	N/A
White goods	0	2,551	2,551	1,661	-890	-53.6
Batteries	400	504	904	777	-127	-16.3
Tires	0	1,401	1,401	1,273	-128	-10.1
PET bottles	0	369	369	199	-170	-85.4
HDPE bottles	0	420	420	561	142	25.3
Oil	<u>500</u>	<u>239</u>	<u>739</u>	4,861	4,122	84.8
<b>TOTAL</b>	<b>21,800</b>	<b>61,340</b>	<b>83,140</b>			

TABLE VII-8  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 South Central Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	1,100	434	1,534	1,656	122	7.4
Refillable soft drink bottles	300	0	300	N/A	N/A	N/A
Container glass	900	7,744	8,644	9,419	775	8.2
Newsprint	8,800	6,726	15,526	13,591	-1,935	-14.2
Corrugated containers	7,300	14,878	22,178	22,769	591	2.6
Computer paper	0	930	930	1,241	311	25.0
Office paper	100	1,637	1,737	4,190	2,454	58.6
Mixed waste paper	0	18,561	18,561	25,318	6,757	26.7
Aluminum cans	700	918	1,618	1,157	-461	-39.8
Aluminum containers	0	254	254	210	-44	-21.1
Tin cans	0	2,644	2,644	2,169	-475	-21.9
Bi-metal cans	0	0	0	N/A	N/A	N/A
Ferrous metals	19,000	7,669	26,669	N/A	N/A	N/A
Nonferrous metals	3,000	762	3,762	N/A	N/A	N/A
White goods	0	1,503	1,503	2,406	903	37.5
Batteries	900	345	1,245	1,125	-120	-10.7
Tires	100	1,595	1,695	1,844	149	8.1
PET bottles	0	399	399	289	-110	-38.1
HDPE bottles	0	468	468	812	344	42.4
Oil	<u>1,200</u>	<u>223</u>	<u>1,423</u>	7,039	5,616	79.8
<b>TOTAL</b>	<b>43,400</b>	<b>67,692</b>	<b>111,092</b>			

TABLE VII-9  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 Northeast Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	1,000	909	1,909	3,013	1,104	36.6
Refillable soft drink bottles	0	3	3	N/A	N/A	N/A
Container glass	1,500	15,893	17,393	17,138	-255	-1.5
Newsprint	14,100	14,011	28,111	24,729	-3,382	-13.7
Corrugated containers	23,300	31,329	54,629	41,426	-13,203	-31.9
Computer paper	200	1,983	2,183	3,447	1,264	36.7
Office paper	1,100	3,546	4,646	7,623	2,977	39.1
Mixed waste paper	1,400	39,147	40,547	46,064	5,517	12.0
Aluminum cans	2,900	1,906	4,806	2,105	-2,701	-128.3
Aluminum containers	0	536	536	383	-153	-39.8
Tin cans	0	5,506	5,506	3,947	-1,559	-39.5
Bi-metal cans	0	3	3	N/A	N/A	N/A
Ferrous metals	26,700	16,284	42,984	N/A	N/A	N/A
Nonferrous metals	3,700	1,469	5,169	N/A	N/A	N/A
White goods	100	2,765	2,865	4,377	1,512	34.6
Batteries	1,500	662	2,162	2,048	-114	-5.6
Tires	2,000	3,374	5,374	3,355	-2,019	-60.2
PET bottles	0	819	819	525	-294	-56.0
HDPE bottles	0	942	942	1,478	536	36.3
Oil	<u>2,800</u>	<u>471</u>	<u>3,271</u>	12,850	9,579	74.5
<b>TOTAL</b>	<b>82,300</b>	<b>141,557</b>	<b>223,857</b>			

TABLE VII-10  
 WASHINGTON DEPARTMENT OF ECOLOGY  
 Recycling and Waste Stream Survey-1987  
 Southeast Waste Generation Area  
 POTENTIALLY AVAILABLE RECYCLABLE MATERIALS

WASTE CATEGORIES	A. ESTIMATED RECYCLED TONS	B. ESTIMATED DISPOSED TONS	C. TOTAL (A+B)	D. ESTIMATED AVAILABLE TONS	E. RESIDUAL TONS (D-C)	F. RES. PERCENT (E/D)
Refillable beer bottles	800	677	1,477	1,941	464	23.9
Refillable soft drink bottles	400	0	400	N/A	N/A	N/A
Container glass	2,200	11,487	13,687	11,045	-2,642	-23.9
Newsprint	1,400	9,866	11,266	15,938	4,672	29.3
Corrugated containers	6,700	18,875	25,575	26,699	1,124	4.2
Computer paper	200	1,063	1,263	2,222	959	43.2
Office paper	100	2,295	2,395	4,913	2,518	51.3
Mixed waste paper	100	26,748	26,848	29,688	2,840	9.6
Aluminum cans	1,500	1,368	2,868	1,357	-1,511	-111.4
Aluminum containers	0	339	339	247	-92	-37.3
Tin cans	200	4,015	4,215	2,544	-1,671	-65.7
Bi-metal cans	0	0	0	N/A	N/A	N/A
Ferrous metals	14,600	10,329	24,929	N/A	N/A	N/A
Nonferrous metals	2,700	1,318	4,018	N/A	N/A	N/A
White goods	100	2,853	2,953	2,821	-132	-4.7
Batteries	700	619	1,319	1,320	1	0.1
Tires	200	2,321	2,521	2,162	-359	-16.6
PET bottles	0	613	613	338	-275	-81.3
HDPE bottles	0	752	752	952	200	21.0
Oil	<u>2,700</u>	<u>361</u>	<u>3,061</u>	8,255	5,194	62.9
<b>TOTAL</b>	<b>34,600</b>	<b>95,900</b>	<b>130,500</b>			