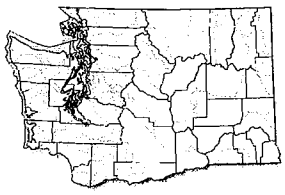
STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

CERTIFIED MAIL
7006 2760 0000 0402 5575

October 23, 2007

Ms. Penny Ingram, Regulatory Analyst
WA Utilities and Transportation Commission
1300 South Evergreen Park Drive SW
P.O. Box 47250
Olympia, WA 98504-7250



Your address is in the **Deschutes** watershed

Dear Ms. Ingram: Penny

RE: *Preliminary Review of Jefferson County Solid Waste Management Plan, Preliminary Draft October 2007*

The Department of Ecology (Ecology) is forwarding the formal submission of the **draft** *Jefferson County Solid Waste Management Plan, Preliminary Draft October 2007* for preliminary review under RCW 70.95.090 and 70.95.094. Enclosed are two copies of the plan which include the cost assessment questionnaire.

Ecology received this plan on October 18, 2007. Under the Interagency Agreement, comments from WUTC plan reviewers should be sent within 45 days from the date the plan is received by the WUTC.

Please forward copies of your correspondence with Jefferson County to me, and also please inform me of the date when this item will be presented at the WUTC public meeting.

Should you have questions about the information contained in the cost assessment questionnaire, please contact Al Cairns at (360) 385-9243. Any other questions can be directed to me. Thank you for your continued cooperation and assistance in plan review.

Sincerely,

Tami Ramsey
Regional Planner
Solid Waste & Financial Assistance Program

TR:lmc
Enclosures

cc: Carole Washburn, WUTC
Al Cairns, Jefferson County

JEFFERSON COUNTY SOLID WASTE MANAGEMENT PLAN

PRELIMINARY DRAFT
OCTOBER 2007

Jefferson County Department of Public Works
623 Sheridan Street
Port Townsend, WA 98368

PRELIMINARY DRAFT

JEFFERSON COUNTY SOLID WASTE MANAGEMENT PLAN

October 2007

Prepared for:

Jefferson County Department of Public Works
PO Box 2070
Port Townsend, Washington 98368

Prepared by:

Green Solutions
PO Box 680
South Prairie, WA 98385-0680
(360) 897-9533

ACKNOWLEDGMENTS

This Jefferson County Solid Waste Management Plan (SWMP) incorporates the program planning and changes put into practice since the previous solid waste plan was published in 2000. The Jefferson County Department of Public Works recognizes the following organizations, and those individuals who participated, for their significant contributions to program planning since 2000 and for their assistance in the development of this SWMP:

- Jefferson County's Solid Waste Advisory Committee members, past and present, and the agencies and businesses they have represented.
- Jefferson County's Public Works Department, Solid Waste Division staff.
- Jefferson County's Environmental Health Division staff.
- The City of Port Townsend.
- Washington Department of Ecology, Solid Waste Services staff.

Jefferson County residents also contributed to this document, through comments received during countywide public meetings on solid waste services, and through various inquiries or comments. The Board of County Commissioners and the Public Works Department gratefully acknowledge this input by the citizens.

CONTENTS

CHAPTERS

Page

Table of Contents, Continued

Table of Contents, Continued

APPENDICES

This copy is designed for double-sided printing, with blank pages inserted where necessary so that chapters and other sections begin on the right-hand side. Please print two-sided (if you must print at all) and use recycled paper.

Table of Contents, Continued

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

INTRODUCTION

This Solid Waste Management Plan (SWMP) was prepared to provide a guide for solid waste activities in Jefferson County. This document was developed in response to the Solid Waste Management Act, Chapter 70.95 of the Revised Code of Washington (RCW), which states:

> "Each county within the State, in cooperation with the various cities located within such county, shall prepare a coordinated, comprehensive solid waste management plan" (Section 70.95.080).

This SWMP addresses solid waste management throughout Jefferson County. The one incorporated area, the City of Port Townsend, had the option to develop its own plan but chose to participate in the County's planning process (per Resolution #92-79, see Appendix A). The various Tribes in Jefferson County use the County's facilities and, because this SWMP may affect their solid waste management options, careful review of this plan was recommended for the Hoh, Quinault and James-town S'Klallam Tribes. Federal agencies with facilities and activities in Jefferson County were also encouraged to review this plan because of the potential impacts to their operations.

The minimum contents of this SWMP are specified by State law (RCW 70.95.090) and further described in Guidelines for the Development of Local Solid Waste Management Plans and Plan Revisions issued by the Washington Department of Ecology (Ecology 1999). The Solid Waste Management Act specifies that this SWMP must "be maintained in a current and applicable condition" through periodic review and revisions (RCW 70.95.110).

This SWMP was prepared through a team effort involving the Jefferson County Department of Public Works and the Solid Waste Advisory Committee (SWAC). The SWAC members represent not only the interests of their respective agencies and businesses, but as residents and members of the community they also represent the public's interest.

VISION AND GOALS

The Jefferson County Solid Waste Management Plan uses the following vision statement for guidance in program operations and development:

> **Jefferson County and its partners should conduct and promote activities that contribute to a sustainable future. To the extent possible, solid waste should be viewed as a misplaced resource. At the same time, it should be recognized that actions need to be taken "upstream" from the point of waste generation to prevent the wasteful use of resources.**

The solid waste system in Jefferson County, as in other areas, continues to adjust to many externalities that affect needs and operations. Likewise, this SWMP must be able to adjust to changes in order to continue to provide useful guidance. While many of the externalities that the

SWMP must contend with are unpredictable, there are several local and global factors that can be identified at this time:

- increasing energy prices,
- lack of nearby rail access,
- increasing average age of the county's population, and
- the need to change current practices in response to and to mitigate the impact of climate change.

The goals and objectives for this Solid Waste Management Plan are:

- to develop a solid waste system that promotes and maintains a high level of public health and safety, and which protects the natural and human environment of Jefferson County.
- to implement, to the fullest extent possible and in descending order of priority, a solid waste management system that;
  - promotes waste reduction,
  - reduces the waste stream,
  - promotes recycling, and
  - minimizes the amount of land required for future waste disposal.
- to promote input and ensure public participation in the planning process.
- to develop an economically responsible program for solid waste management that recognizes the needs for environmental protection and service to the citizens of the County.
- to promote the use of private industry to carry out the components of the solid waste system, if feasible.
- to encourage cooperative and coordinated efforts among government agencies, private companies and the public to support the goal of sustainable resources for the community.
- to be consistent with other existing resource management and local plans.
- to incorporate flexibility to accommodate future needs.

PLAN ORGANIZATION

The Jefferson County Solid Waste Management Plan (SWMP) is organized as follows:

Chapter 1: Introduction
Chapter 2: Background Information
Chapters 3 through 9: Elements of the Solid Waste Management System

Chapter 1 describes the purpose and goals of this SWMP, its relationship to other plans, and the process and schedule for updating the SWMP. Chapter 2 provides important information about

demographics, waste quantities, and other information that supports the findings of this SWMP. Chapters 3 through 9 discuss the various elements of the County's solid waste management system, and provide the information and analysis on which the recommendations are based.

BACKGROUND

The current (2005) amount of solid waste generated in Jefferson County is 47,190 tons per year. Of this, 46% is diverted through recycling or composting, an additional 10% is "diverted" to beneficial uses that do not strictly count as recycling, and the remaining 20,800 tons are disposed of through the County's waste export system. The amount of waste generated in the County is expected to increase to 69,800 tons per year in 2025. At the current diversion rates, 32,160 tons of this future amount will be recycled or composted, 6,800 tons will be diverted to other beneficial uses, and 30,800 tons will be disposed.

Data is provided in this SWMP on the composition of the waste sent to a landfill for disposal, although this data is from a neighboring county and so may not accurately reflect Jefferson County's conditions. A local study should be conducted before the County or another party makes a significant investment that relies on the composition of the waste stream (such as for a waste processing facility).

PROCESS AND SCHEDULE FOR ADOPTION OF THE SWMP

This copy of the Jefferson County Solid Waste Management Plan is a "preliminary draft" that has been prepared for public review and review by Ecology and the UTC.

The process of reviewing and updating this copy of the SWMP began in 2006. A subcommittee of the SWAC reviewed revisions to each chapter at monthly meetings from October 2006 through March 2007, and then the full SWAC reviewed a complete copy of the draft SWMP in order to establish priorities. A "preliminary draft" of this SWMP was prepared and released for public review in October 2007. A public hearing will be held in November 2007 to receive comments on the preliminary draft. Comments received on the preliminary draft will be incorporated to produce a "final draft" that will be offered for adoption by the City of Port Townsend and Jefferson County.

RECOMMENDATIONS

The specific recommendations proposed by this SWMP are shown below and are numbered for review purposes, using a number and an abbreviation for the topic (for example, WR3 is the third recommendation for Waste Reduction). Additional details about the recommendations can be found in the appropriate chapter of the plan.

The recommendations are shown below in the order that they appear in the chapters. In the tables at the end of this Executive Summary, the recommendations have been rearranged into three categories according to high, medium and low priority (see Tables E.1, E.2 and E.3). This was done to assist the County with the allocation of funds, staff and other resources according to the activities with the greatest priority, feasibility and cost-effectiveness.

The specific recommendations found in this SWMP are listed below by chapter.

Chapter 3: Waste Reduction and Public Education

Chapter 3 of the SWMP discusses two related topics: waste reduction and public education.

Waste Reduction: There are several good programs in Jefferson County for waste reduction. This SWMP recommends continuing the existing programs, with refinements or expansions of a few of these:

WR1) County and City staff, with the SWAC's assistance, will periodically re-evaluate the County's overall goal for waste diversion and its components, including waste reduction.

WR2) The County and SWAC will continue to investigate procedures for estimating the effectiveness of the waste reduction programs.

WR3) County solid waste staff, with the assistance of the SWAC and other members of the community, will continue to research and promote options for reuse, including but not limited to, brochures advertising local opportunities (including thrift and secondhand stores), reuse at the County's Moderate Risk Waste Facility, expanded presence in the local media, and expanded use of County and City web sites.

WR4) The County and City need to expand in-house waste reduction, recycling and procurement programs. Providing education, leadership and other assistance to businesses to implement similar programs will also be pursued.

Public Education: Discussions of public education concluded it is one of the highest priority activities needed to support the Jefferson County solid waste management system. Much is already being accomplished but there are significant opportunities for additional public education activities, leading to the following recommendations:

PE1) Public education will be given a very high priority. Public education must include activities such as;

- classroom presentations and other outreach through the schools (PE2).
- presentations and booths at special events and other locations (PE3).
- education for the County's Moderate Risk Waste Facility will be expanded, including the household hazardous waste and conditionally-exempt small quantity generator programs, information about materials that will not be accepted for disposal at the Solid Waste Transfer Station and Quilcene Drop Box, and giving waste prevention activities the highest priority (PE4).
- education and promotion for the City's Biosolids Compost Facility, on-site composting and worm bins will be expanded. The County and the Washington State University Cooperative Extension Service will cooperate to promote backyard composting (PE5).
- a public education component must be included in all waste reduction, recycling or composting programs, and public education must continue to be a primary element of program maintenance in the City and County. Education associated with recycling collection will be focused on improving and expanding participation as well as generating feedback and answering questions from the public. The responsibility for this lies primarily with the recycling contractor, the certificated haulers and the

contract hauler (in the City of Port Townsend), who must inform their customers of the correct materials and preparation methods for recycling. Public education and other waste diversion programs that are included in City or County contracts must be fully implemented (PE6).

- the County will conduct outreach to inform citizens and businesses of the true costs of all components of the solid waste system, and any alternative funding options that may be considered by the County and City (PE7).
- the County, through a cooperative effort by Public Health and the Department of Public Works, will expand education and enforcement addressing illegal dumping (PE8, see also Recommendations RA4 and S1).
- the County, with assistance from the SWAC, will conduct a recognition program for businesses that reduce and/or recycle a significant portion of their wastes, basing this program on existing models from other communities (PE9).
- sustainability concepts will be included in public education materials developed by the County (PE10).
- the initiatives addressed by the state's Beyond Waste plan will be given a high priority (PE11).

PE12) Public information and education programs will be implemented and expanded through a joint Health/Public Works agreement, and in cooperation with the City, haulers and recycling companies.

PE13) A review will be conducted periodically of the public education program and other components of the solid waste system to evaluate the need to update or revise terms used so as to provide more meaningful communication.

Chapter 4: Recycling

Chapter 4 of the SWMP discusses existing programs and provides recommendations for two types of recycling: "traditional" recycling programs based on source-separation (which requires some level of separation of the materials prior to collection) and mixed waste processing programs (where recyclable materials are separated from garbage at a central processing facility).

Source-Separation Recycling Programs: The recycling programs in Jefferson County are diverting a substantial amount of materials from disposal, but a few additional opportunities were noted in examining these programs. This led to the following recommendations:

R1) The County will continue to strive to meet a 50% goal for waste reduction, recycling, composting and waste diversion.

R2) In order to meet the goal of improved recycling economics, existing recycling programs will be examined to increase their cost-effectiveness. Expanded recycling programs may require additional financial support. The SWAC will continue with its proactive role in addressing these issues. The County and City will continue to explore all funding and contract options for the recycling program.

R3) Public recycling containers should be available throughout the County. Options for locating these on County/City or other public property will be pursued, and incentives for encouraging private businesses to host recycling containers will be examined.

R4) The County and City will encourage market development for designated and potentially recyclable materials. Participation by the business community and economic development agencies will be encouraged in this effort, and a priority should be put on finding feasible local alternatives for problem materials (such as the potential use of glass as aggregate).

R5) The County and City will continue to support and encourage private efforts to divert recyclable materials from non-residential sources.

R6) A Recycling Potential Assessment (RPA) will be conducted in Jefferson County, contingent on grant funds being available for this.

Mixed Waste Processing: Mixed waste processing is not used in Jefferson County, but variations of this approach may be worthy of further consideration in the future, leading to the following two recommendations:

R7) The County will continue to evaluate the possibility of pulling recyclable and/or reusable materials from solid waste after it is dumped on the floor of the Transfer Station.

R8) Any proposal for a mixed waste processing or composting system must include conducting an RPA and a demonstration or pilot project.

Chapter 5: Composting

Several types of composting are examined in Chapter 5, including composting of yard debris, food waste, and mixed solid waste. No recommendations have been made for solid waste composting, but the recommendations being made for the first two options are shown below.

Yard Debris Composting: Overall, current programs for yard debris composting are performing well and only a few refinements are being recommended (see also Recommendations S11 and S12 for land-clearing debris):

C1) The County will continue to partner with the City of Port Townsend to maintain and expand their biosolids composting operations. If the supply of compost increases above demand, the County and City will utilize the finished product on County and City properties and projects, when applicable.

C2) The County will promote organics reduction methods through the education program.

Food Waste Composting: Discussions about food waste concluded that there are activities that may have potential value in the future:

C3) Small-scale vermicomposting projects will be encouraged at schools and other locations. Home composting of food waste will be encouraged with public education on the proper methods for vermicomposting or incorporation into compost bins.

C4) The feasibility of collecting food waste from commercial sources will be examined.

C5) Encourage composting and other alternatives for food waste generated by businesses and institutions.

Chapter 6: Waste Collection and Transfer

Chapter 6 of the SWMP examines the current system for collecting and transferring solid waste in Jefferson County.

Solid Waste Collection: In general, the existing solid waste collection system is functioning well, and only one recommendation is being made concerning it:

WC1) Certificate haulers and municipal contracts will continue to use variable rate structures such as volume-based rates, and incentive rates will be implemented by the certificated haulers to encourage recycling by their residential customers. The implementation of incentive rates will require that the County first adopt a service ordinance addressing this rate structure. Additional incentives and alternative rate structures that promote waste reduction and recycling should also be considered.

In-County Transfer: As with waste collection, the existing Quilcene Drop Box is working satisfactorily and only one recommendation is being made for in-county transfer at this time:

T1) The County will continue to evaluate options for maintaining drop box service in the unincorporated areas of the County.

Chapter 7: Disposal

Chapter 7 discusses existing practices and options for several disposal methods, including incineration, in-county landfilling, waste import and waste export. No recommendations are being made for incineration and waste import, but the recommendations for in-county landfilling and waste export are shown below. Furthermore, no specific recommendations are being made for the development of an in-county landfill, but Recommendations RA2 and S6 provide an opportunity to evaluate regional opportunities for solid waste disposal.

In-County Landfilling: Discussion of in-county landfilling led to the following recommendation:

L1) Old dump sites that are known to exist in the County must be documented and inspected, with the goal of developing an assessment of their long-term liability.

Waste Export: Most of Jefferson County's disposal needs are currently being served by an effective waste export system with adequate capacity to handle the projected growth in population and waste quantities over the 20-year planning period. The first step in the waste export system is the Jefferson County Waste Management Facility, which is the designated disposal facility for all waste generated in Jefferson County (except waste from the west end of the County). The west end

of the County is difficult to serve cost-effectively due to the geographic barrier posed by the Olympic Mountains, leading to the following recommendation:

WE1) The implementation of a "north-south corridor" to serve the western ends of both Jefferson and Clallam Counties is recommended, although further discussions will be needed to determine implementation details.

Chapter 8: Regulation and Administration

Regulation and Administration: The following recommendations are made for regulation and administration:

RA1) Solid waste operations in Jefferson County shall be financially self-supporting, and the County and City should continue to pursue options for different fee structures that achieve this goal.

RA2) The County should continue to pursue and investigate all opportunities for regionalization of solid waste management programs.

RA3) Enforcement of City and County litter and solid waste ordinances should be given top priority.

Chapter 9: Special Wastes

This SWMP examines the sources and existing programs for ten special waste streams, and concludes that seven of these pose current or potential disposal problems. For these seven waste streams, options for improved handling were discussed and the following recommendations were developed.

Biomedical and Pharmaceutical Wastes: Syringes ("sharps") have been found improperly disposed in several locations, and there is increasing evidence that pharmaceuticals are becoming an environmental pollutant, leading to the following recommendations:

S1) Increased education efforts will be conducted by Jefferson County Public Health to target residential medical waste and encourage proper disposal of it (see also PE8).

S2) Public Works will continue to pursue and cooperatively manage a collection program for residential sharps.

S3) Public Works and Public Health will participate in statewide or other programs for pharmaceutical wastes.

Biosolids and Septage: Presently there are some issues with septage disposal in the region, leading to the following recommendation:

S4) The City of Port Townsend and Jefferson County, with assistance from the SWAC, will continue to contribute to the discussion of septage disposal issues and problems.

Construction and Demolition (C&D) Wastes: C&D wastes are generated in significant quantities but lack adequate recycling or cost-effective disposal options, leading to the following recommendations:

S5) Existing opportunities for reuse (through reuse stores) and recycling of construction and demolition wastes will be promoted to homeowners and building professionals by the County as part of the public education efforts conducted for waste reduction and recycling.

S6) County staff and SWAC will participate in future discussions to evaluate the feasibility of a regional C&D landfill.

S7) Jefferson County staff will explore the feasibility of including a waste exchange in the design for the new transfer station.

Electronic Waste (E-Waste): Electronic wastes have received increasing recognition over the past few years as a potential source of serious environmental pollutants, leading the State of Washington to adopt a new program to address these wastes (which is still under development at this time), and leading to the following recommendation:

S8) The County will participate in the state-mandated program anticipated to go into effect January 1, 2009.

Grease: Grease is not easily handled by the solid waste disposal system or wastewater treatment systems, and it is typically handled through separate collection and recycling. The value of grease may be increasing in the future, however, due to the ability to convert it into a fuel. These factors led to the following two recommendations:

S9) Restaurant inspectors from Jefferson County Public Health will educate restaurant owners and employees about proper handling and disposal practices for grease, and encourage recycling of this material where appropriate.

S10) The County will consider methods to encourage conversion of grease (and other waste materials) to biofuel.

Land-Clearing Debris: Large quantities of land-clearing debris are brought to the Port Townsend Biosolids Compost Facility, at times more than the facility can easily handle, while at the same time there is increasing interest in seeing this material stay on the site where it is generated to enrich soils and provide other benefits, leading to the following two recommendations:

S11) A tipping fee will be instituted at the Jefferson County Waste Management Facility/Biosolids Compost Facility for land-clearing debris.

S12) On-site management of land-clearing debris will be strongly encouraged..

Moderate Risk Wastes (MRW): Jefferson County has an effective program for separate collection and proper disposal of moderate risk (hazardous) wastes, and hence the only recommendations

being proposed are to refine the existing system (see also PE4, page E-4):

S13) Existing collection efforts for MRW, including regional cooperation, will be continued and possibly expanded, where feasible.

S14) More education is needed for MRW, especially for non-toxic alternatives and waste reduction.

Summary of Recommendations in Order of Priority

Tables E.1 through E.3 show the recommendations in order of priority. The priority for each recommendation was established by the Jefferson County Solid Waste Advisory Committee. Due to space limitations, recommendations are shown in an abbreviated fashion in these tables.

As can be seen in the attached tables, many of the recommended programs are "ongoing" (i.e., have already been implemented or planned) and costs are shown as "existing" (i.e., funding has already been included in the County's and other budgets). This is largely the result of the County's and City's continual efforts to examine the solid waste management system and make appropriate adjustments over recent years. Through their continual efforts to monitor and adjust the solid waste system, the County and City have created a well-planned, integrated system for solid waste management.

In discussing the priorities of the recommendations, the SWAC concluded that three of the recommendations have the highest priority. Hence, these three recommendations are viewed as "guiding principles" for the Jefferson County solid waste management system:

- solid waste operations shall be financially self-supporting (RA1),
- the County will strive to meet a 50% goal for waste reduction, recycling and composting (R1), and
- public education will be given a very high priority (PE1), since it is the means of achieving many of the other recommendations.

Table E.1. High Priority Recommendations.

Guiding Principles for the Jefferson County Solid Waste System:

RA1) Solid waste operations in Jefferson County shall be financially self-supporting, and the County and City should continue to pursue options for different fee structures that achieve this goal.

R1) The County will strive to meet a 50% goal for waste reduction, recycling and composting.

PE1) Public education will be given a very high priority.

Recommended Activity	Lead Agency	Schedule	Cost	Funding Source
WR3) Continue to research and promote options for reuse.	County	Ongoing	Existing [1]	County/CPG
Public education should be implemented through activities such as;				
➢ classroom presentations and other outreach thru schools (PE2).	County [2]	Ongoing	Existing	County/CPG
➢ presentations, booths at special events, other locations (PE3).	County	Ongoing	Existing	County/CPG
➢ expand public education for the MRW programs (PE4).	County	Ongoing	Existing	County/CPG
➢ expand education and promotion for composting (PE5).	City/County	Ongoing	Existing	City/County
➢ public ed. included in all waste diversion programs (PE6).	County	Ongoing	Existing	County/Rates/City
➢ conduct outreach about true costs of solid waste disposal (PE7).	County	Ongoing	Existing	County
➢ expand education and enforcement for illegal dumping (PE8).	County	Ongoing	Existing	County/CPG
➢ conduct a recognition program for businesses (PE9).	County	Ongoing	Existing	County/CPG
➢ include sustainability concepts in public ed. materials (PE10).	County	Ongoing	Existing	County/CPG
➢ Beyond Waste initiatives will be given a high priority (PE11).	County	Ongoing	Existing	County/CPG
PE12) Public education to be implemented through joint effort.	County	Ongoing	Existing	County/CPG
R3) Public recycling containers should be available.	County	Ongoing	Unknown	Uncertain
C1) Continue County/City partnership for composting operations.	City/County	Ongoing	Staff time [1]	County/City
C2) County to promote organics reduction methods.	County	Ongoing	Staff time	County
RA3) Enforcement of solid waste ordinances is a top priority.	County	Ongoing	Existing	County

Notes:
1. Costs shown as "existing" denote existing activities that have already been budgeted and included in staff workloads; and costs shown for "staff time" are for new activities that will require a small amount of staff time (for existing staff).
2. For lead agency for public education activities, "County" could be either the Public Health and/or Public Works Department.

Table E.1. High Priority Recommendations, continued.

Recommended Activity	Lead Agency	Schedule	Cost	Funding Source
S1) Increased education for disposal of residential medical waste.	County [1]	Ongoing	Existing	County/CPG
S2) Continue to pursue collection program for residential sharps.	County [1]	Ongoing	Existing [2]	County/CPG
S5) Promote opportunities for reuse and recycling of C&D wastes.	County	Ongoing	Existing	County/CPG
S8) Participate in statewide e-waste program.	County	Begin in 2008	Minimal	NA
S9) Encourage proper handling and disposal practices for grease, including recycling.	Public Health	Ongoing	Staff time	County
S11) Begin tipping fee for land-clearing debris.	County	By January 2008	NA [3]	NA
S12) Encourage on-site handling of land-clearing debris.	County [1]	Ongoing	Existing	County/CPG
S14) More education for non-toxic alternatives and waste reduction for MRW.	County[1]	Ongoing	Existing	County/CPG

Notes:
1. For the lead agency for S1, S2, S12 and S14, "County" is both Public Health and the Public Works Department.
2. Costs shown as "existing" denote existing activities that have already been budgeted and included in staff workloads; and costs shown for "staff time" are for new activities that will require a small amount of staff time (for existing staff).
3. The cost for S11 is shown as "NA," meaning there will be no net cost to the solid waste system, although there will be a cost to solid waste customers with yard debris.

Table E.2. Medium Priority Recommendations.

Recommended Activity	Lead Agency	Schedule	Cost	Funding Source
WR2) Continue to investigate procedures for estimating the effectiveness of waste reduction.	County/SWAC	Periodically	Staff and committee time [1]	County/CPG
WR4) The County and City need to expand in-house waste reduction, recycling and procurement programs.	City and County	By Dec. 2008	Existing [1]	City/County/CPG funds
R2) Recycling programs will be examined to increase cost-effectiveness.	County/SWAC	Ongoing	Existing	County
R4) Encourage market development for recycled materials.	County [2]	Ongoing	Uncertain	County/Grants
R5) Continue to support and encourage private efforts for waste diversion from non-residential sources.	County	Ongoing	Staff time	County/Grants
C3) Encourage small-scale vermicomposting projects.	County [2]	Ongoing	Existing	County/CPG
C4) Examine feasibility of collecting commercial food waste.	County [2]	Ongoing	Existing	County/CPG
C5) Encourage commercial food waste programs.	County [2]	Ongoing	Existing	County/CPG
WC1) Franchise haulers and municipal contracts will continue to use volume-based rates and incentive rates.	County and City	Ordinance by 12-08, Rates by 12-09	Staff time	County/City
T1) Continue to evaluate options for maintaining drop box service in the unincorporated areas.	County	Ongoing	Existing	County
S4) Continue to contribute to discussions of septage disposal issues and problems.	City/County [2]	Ongoing	Existing	County/City
S7) Investigate waste exchange for C&D at new transfer station.	County	Concurrent with transfer station design	Uncertain	County
S10) Consider options to encourage biofuel.	County	Ongoing	Uncertain	County
S13) Continue and expand MRW collection efforts.	County	Ongoing	Uncertain	County/City

Notes:
1. Costs shown for "staff time" are for new activities that will require a small amount of staff time (for existing staff); costs shown as "existing" denote existing activities that have already been budgeted and included in staff workloads.
2. For the lead agency for R4, C3, C4, C5, and S4, "County" includes both Public Health and the Public Works Department.

Table E.3. Low Priority Recommendations.

Recommended Activity	Lead Agency	Schedule	Cost	Funding Source
WR1) Periodically re-evaluate overall waste diversion goal.	County/SWAC	Annually or every two years	Staff time [1]	County
PE13) Periodically review terms used for solid waste programs.	County/SWAC	Annually or every two years	Staff time	County
R6) Conduct a Recycling Potential Assessment (RPA) if funds are available.	County	Pending funds and interest	Staff time	CPG (with County matching funds)
R7) Continue to evaluate the possibility of recovering recyclable and/or reusable materials from solid waste after it is dumped on the floor of the Transfer Station.	County	Ongoing	Existing [1]	County
R8) Proposals for mixed waste processing or solid waste composting must conduct an RPA and pilot project.	County	Pending private proposals	Existing	Private
L1) Document and inspect old dumps to assess their long-term liability.	County (Public Health)	Ongoing	Staff time	County/Grants
WE1) A "north-south corridor" to serve the western ends of both Jefferson and Clallam Counties should be implemented but further discussions will be needed to determine the feasibility of this approach.	County	By Dec. 2009	Staff time	County
RA2) The County should continue to investigate all opportunities for regionalization of solid waste management programs.	County	Ongoing	Staff time	County
S3) Participate in statewide pharmaceuticals program.	County [2]	Ongoing	Staff time	County
S6) Participate in discussions to evaluate the feasibility of a regional C&D landfill.	County	Ongoing	Staff time	County/City

Notes:
1. Costs shown for "staff time" are for new activities that will require a small amount of staff time (for existing staff); costs shown as "existing" denote existing activities that have already been budgeted and included in staff workloads.
2. For the lead agency for S3, "County" includes both Public Health and the Public Works Department.

CHAPTER 1: INTRODUCTION

1.1 ROLE AND PURPOSE

This Solid Waste Management Plan (SWMP) was prepared to provide a guide for solid waste activities in Jefferson County. This document was developed in response to the Solid Waste Management Act, Chapter 70.95 of the Revised Code of Washington (RCW), which states:

> "Each county within the State, in cooperation with the various cities located within such county, shall prepare a coordinated, comprehensive solid waste management plan" (Section 70.95.080).

The Solid Waste Management Act also specifies that these plans must "be maintained in a current and applicable condition" through periodic review and revisions (RCW 70.95.110), hence the need for this update to the previous plan.

As indicated above, RCW 70.95 delegates the authority and responsibility for the development of solid waste management plans to the counties. Several other governing bodies may wish to participate in the planning process or conduct their own plans, including cities, Tribes, or Federal agencies. By State law, cities may fulfill their solid waste management planning responsibilities in one of three ways: by preparing their own plan for integration into the county's plan; by participating with the county in preparing a joint plan; or by authorizing the county to prepare a plan that includes the city. The City of Port Townsend, who is the only incorporated municipality in Jefferson County, authorized the County to include the City in their planning process. This action was in accordance with City Resolution #92-79 (see Appendix A).

The various Tribes in Jefferson County generally use the County's facilities. Because this SWMP may impact their current and future solid waste management options, careful review of this plan was recommended for the Hoh, Quinault and the Jamestown S'Klallam Tribes. Federal agencies with significant facilities and activities in Jefferson County were also encouraged to review this plan because of the potential impacts to their operations.

The minimum contents of this SWMP are specified by State law (RCW 70.95.090) and further described in Guidelines for the Development of Local Solid Waste Management Plans and Plan Revisions issued by the Washington Department of Ecology (Ecology 1999). To summarize, solid waste management plans must contain:

- an inventory of existing solid waste handling facilities, including an assessment of any deficiencies in meeting current disposal needs.
- the estimated needs for solid waste handling facilities for a period of twenty years.
- a program for the development of solid waste handling facilities that is consistent with this SWMP and that meets the Minimum Functional Standards. The development program must also take into account land use plans, provide a six-year construction and capital acquisition program, and provide a financing plan for capital and operational costs.
- a program for surveillance and control.
- an inventory of solid waste collection needs and operations, including information on collection franchises, municipal operations, population densities of the areas covered by either

franchised or municipal operations, and projected solid waste collection needs for a period of six years.

- a comprehensive waste reduction and recycling element that provides for reduction of waste quantities, provides incentives and mechanisms for source separation, and provides opportunities for recycling source-separated materials.
- waste reduction and recycling strategies, including residential collection programs in urban areas, drop-off or buy-back centers at every solid waste handling facility that serves rural areas, monitoring methods for programs that collect source-separated materials from nonresidential sources, yard debris collection programs and education programs.
- an assessment of the impact that implementation of the SWMP's recommendations will have on solid waste collection costs.
- a review of potential sites for solid waste disposal facilities.

1.2 RELATIONSHIP TO OTHER PLANS

This Solid Waste Management Plan must function within a framework created by other plans and programs, including policy documents and studies that deal with related matters. Two of the more important documents are the Jefferson County Comprehensive Land Use Plan (adopted in 1998 and most recently revised in 2004) and the City of Port Townsend Comprehensive Land Use Plan (adopted July 1996, and amended in 2004). Other important documents include the Jefferson County Hazardous Waste Management Plan (PSR 1991).

1.3 PREVIOUS SOLID WASTE PLANS

Washington State enacted RCW 70.95.080 (requiring counties to develop solid waste plans) in 1969, and subsequently Jefferson County wrote their first plan in the 1970s. The most recent plan was adopted in 2000, and this document is intended to serve as an update to that plan. Table 1.1 shows the recommendations from the 2000 plan and the current status of those recommendations.

1.4 PROCESS FOR UPDATING THE SWMP

The County has regularly monitored the progress made in implementing the recommendations of the 2000 plan, and has frequently reviewed this progress with the Solid Waste Advisory Committee (SWAC) and others. The 2000 plan continued to provide valuable guidance and direction for solid waste programs in Jefferson County well into 2007, but several changes that occurred over the years led to the conclusion that the 2000 plan needed to be updated. Since the base document was still largely relevant, the process of updating the plan was able to be handled through a relatively simple amendment process.

The first step in producing an updated SWMP was to work with the SWAC, County and City staff, Ecology staff, and other interested parties to produce a first draft of the revised plan. The formation, membership makeup, and role of the SWAC are specified by RCW 70.95.165. As required by State law, the Jefferson County SWAC includes individuals representing various interests in solid waste issues, and functioned in a review and advisory capacity throughout the plan development process. The membership and affiliations of the people who were SWAC members during the development of the amended plan are shown in Table 1.2.

Table 1.1. Status of Recommendations from the 2000 Plan.	
Waste Reduction, Public Education	**Status**
WR1) The goal for waste diversion shall be re-evaluated	Accomplished and ongoing
WR2) Continue to investigate procedures for estimating the effectiveness of waste reduction programs	Accomplished and ongoing
WR3) Continue to research and promote reuse	Accomplished and ongoing
WR4) Adopt a resolution of support for State and Federal waste reduction legislation	No
WR5) County and City should expand in-house efforts	Accomplished and ongoing
PE1) Public education should be given a high priority	Yes
PE2) Provide classroom presentations	Yes
PE3) Joint City/County agreement for cooperative education activities	No
PE4) Expand education for MRW Facility	Accomplished and ongoing
PE5) Expand education for composting	No
PE6) Maintain education efforts and conduct education as required in various contracts	Yes
PE7) Information on true costs to be distributed	Accomplished and ongoing
PE8) Conduct illegal dumping campaign	Accomplished and ongoing
PE9) Conduct recognition program for businesses	Accomplished and ongoing
PE10) Include sustainability concepts in public education	No
Recycling	
R1) Goal for waste reduction, recycling and composting is 35%	Goal has been exceeded
R2) Examine cost-effectiveness of recycling programs	Accomplished
R3) Provide public recycling containers throughout county	Accomplished and ongoing
R4) Encourage market development	No
R5) City and county to encourage private recycling efforts	Yes
R6) Evaluate the possibility for dump-and-pick activities	Yes
Composting	
C1) City and county to cooperate in maintaining biosolids composting facility	Accomplished and ongoing
C2) Construct demonstration gardens in one or more parks	No
C3) Encourage small-scale vermicomposting projects	Accomplished and ongoing
Waste Collection and Transfer	
WC1) Continue use of variable rates	Yes
T1) Continue to evaluate options for maintaining drop boxes	Yes
Disposal	
L1) Inventory old dump sites	Yes
WE1) Implement "north-south corridor" for west ends of Jefferson and Clallam Counties	No
Regulation and Administration	
RA1) Solid waste operations shall be financially self-supporting	Yes
RA2) Continue to investigate options for regionalization	Accomplished and ongoing
RA3) Consider cost of illegal dumping cleanup when evaluating drop box closures and other changes	Yes
RA4) Give top priority to enforcement for controlling illegal dumping	Yes
Special Wastes	
S1) Increased education for residential biomedical wastes	Yes
S2) Continue discussions of septage disposal problems	Accomplished and ongoing
S3) Promote reuse for building materials	Accomplished and ongoing
S4) Investigate feasibility of regional C&D landfill	Yes
S5) Restaurant inspectors to encourage proper grease handling	Accomplished but remains a problem
S6) Continue MRW collection, and expand if feasible	Accomplished and ongoing

Table 1.2. Membership of the Jefferson County SWAC.

Current Members *	Affiliation
Kent Kovalenko, Chair	Murrey's Olympic Disposal
Kristin Marshall	Port Townsend Paper Corp.
Tami Ruby	Port of Port Townsend
Matt Hall	Skookum Environmental Services
John Merchant	City of Port Townsend
Martha and Robert Burns	District #3 Representative
Valerie Johnston	District #1 Representative
Joanne Tyler	District #1 Representative
Ex-Officio and Support Staff	
Al Cairns	Jefferson County Solid Waste Coordinator
Tami Pokorny	Jefferson County Environmental Health
Tami Ramsey	Department of Ecology

* Current members as of February 2007.

The SWAC members not only represent the interests of their respective agencies and businesses, but as residents and members of the community they also represent the public's interest. The Jefferson County SWAC has been proactive throughout its existence by assisting with the County's solid waste budget, outreach efforts, and communication with the Board of County Commissioners.

The process of updating and adopting this SWMP consisted of the following steps:

- preparation and review of revised chapters for comment by the SWAC and County staff.
- compiling the revised chapters into a complete draft for review and comment by the SWAC and County staff.
- development of a SEPA checklist for the draft SWMP.
- determination of cost and rate impacts using the Cost Assessment Questionnaire provided by the Washington Utilities and Transportation Commission (UTC).
- review of the Preliminary Draft SWMP by the public, Ecology and UTC.
- incorporation of public, UTC and Ecology comments to produce the Final Draft SWMP.
- adoption by Port Townsend and Jefferson County.
- submittal of the Final SWMP with resolutions of adoption to Ecology for final approval.
- after final approval by Ecology, the implementation period for the new SWMP begins.

1.5 PLAN AMENDMENT PROCESS

Ecology's Planning Guidelines require that solid waste management plans be reviewed at least every five years, with the five-year period beginning when the current plan has received final approval from Ecology. For this plan, final approval from Ecology is projected to be in 2007, but time should be allowed for the development of the next plan (if necessary) and so the review process should begin again in 2011 and, if necessary, a new SWMP adopted in 2012. Before that time, however, this SWMP can be kept in a current condition through amendments addressing specific items (such as changes in operations or in regulatory requirements), thus possibly avoiding the need for a substantial revision in five years.

If not updated in 2011/2012, the plan should be reviewed periodically (at least annually) after 2011 to determine if an update is needed. At any point in time, however, it may be necessary to revise this SWMP due to one or more specific changes, and if this occurs then the changes could be either addressed through an amendment or through a revision to the plan, depending on the magnitude of the change(s).

An amendment is a simpler process that can be used to keep the SWMP current for minor changes. Amendments can be used when there are minor changes in programs, financing and operations, and these changes are still within the original scope and goals of the SWMP. For more significant changes, a plan revision may be needed. Examples of changes that would require a plan revision include a change in the disposal method, the development of a new transfer station or disposal facility, addition or deletion of curbside recycling programs, other significant changes in service levels, regionalization of programs, a change in the underlying vision of the plan, or other changes that impact all or most of the elements of the solid waste system. The process for adopting a revision to the SWMP would be similar to the process for creating the SWMP in the first place, but amendments can be adopted through a simpler process.

The following steps should be undertaken if the SWMP needs to be amended:

1. a proposed amendment to the SWMP should be prepared by the local government agency (or other party in special cases) initiating the change. This should generally be preceded by discussions at the SWAC. The proposed amendment must be presented to the SWAC for review and comment, and submittal to the SWAC should be accompanied by a report providing an analysis of the impacts of the proposed change.

2. the SWAC should act upon the proposed amendment by forming recommendations in a timely manner. Once a recommendation has been adopted or drafted by the SWAC, it should be submitted to Ecology staff for review and comment.

3. the proposed amendment can then be revised as necessary and presented for adoption by the elected officials of the municipalities and Jefferson County. This part of the process may require special meetings or other steps consistent with agreements and procedures in effect at that time.

4. once the amendment has been adopted, Ecology must be notified and the amendment should be included with any future copies of the SWMP.

For amendments initiated by outside parties (i.e., other than city or county staff), the Director of the Department of Public Works may develop reasonable rules for submitting and processing proposed plan amendments and may establish reasonable fees to investigate and process such petitions. All administrative rulings of the Director may be appealed to the Board of County Commissioners.

Minor changes that may occur in the solid waste management system, whether due to internal decisions or external factors, can be adopted without the need to go through a formal amendment process. If a question exists as to whether or not a change is too minor for an amendment, it should be discussed by the SWAC and a decision made based on the consensus of that committee.

One of the changes considered too minor to require an amendment to the SWMP is a change in the lead agency for a specific program, as long as the general goals and scope of the program stay largely the same. For instance, responsibility for a specific program could be shifted from the City of Port Townsend to Jefferson County (or vice versa), from one county department to another, or from Jefferson County alone to a joint arrangement with another agency, without the need for an amendment or revision to the SWMP as long as the scope of the program remains similar.

Also implicit in the development and adoption of this plan is the understanding that emergency actions may need to be taken by the County in the future for various reasons, and that these actions can be undertaken without needing to amend this plan beforehand. In this case, Jefferson County staff will endeavor to inform the SWAC and other key stakeholders as soon as feasibly possible, but not necessarily before new actions are implemented. If the emergency results in permanent and significant changes to the Jefferson County solid waste system, an amendment to this plan will be prepared. If, however, the emergency actions are only undertaken on a temporary or short-term basis, an amendment will not be considered necessary. Any questions about what actions may be considered "temporary" or "significant" should be deferred to the SWAC for their advice. The ability to declare an emergency is only an option for Jefferson County Public Works Department and cannot be done by any other public or private entity, but others can request the declaration of an emergency and approval of emergency response actions as appropriate (such a request should be submitted verbally or in writing to the Public Works Director).

1.6 VISION STATEMENT FOR THE SWMP

The Jefferson County Solid Waste Management Plan uses the following vision statement for guidance in program operations and development:

> **Jefferson County and its partners should conduct and promote activities that contribute to a sustainable future. To the extent possible, solid waste should be viewed as a misplaced resource. At the same time, it should be recognized that actions need to be taken "upstream" from the point of waste generation to prevent the wasteful use of resources.**

The solid waste system in Jefferson County, as in other areas, continues to adjust to many externalities that affect needs and operations. Likewise, this SWMP must be able to adjust to changes in order to continue to provide useful guidance. While many of the externalities that the SWMP must contend with are unpredictable, there are several local and global factors that can be identified at this time:

- increasing energy prices,
- lack of nearby rail access,
- increasing average age of the county's population, and
- the need to change current practices in response to and to mitigate the impact of climate change.

These factors will affect the costs of solid waste management, and the financial and social priorities of various programs. As these changes unfold, it is intended that the above vision statement will continue to provide guidance for the solid waste system.

1.7 GOALS OF THE SWMP

In addition to meeting the requirements of State law and other mandates, the goals established by Jefferson County for this update of the Solid Waste Management Plan (not in order of priority) are to:

- develop a solid waste system that promotes and maintains a high level of public health and safety, and which protects the natural and human environment of Jefferson County.
- implement, to the fullest extent possible and in descending order of priority, a solid waste management system that;
  - reduces the waste stream,
  - promote reuse
  - promotes recycling, and
  - minimizes the amount of land required for future waste disposal.
- promote input and ensure public participation in the planning process through the year 2027.
- develop an economically responsible program for solid waste management that recognizes the needs for environmental protection and service to the citizens of the County.
- promote the use of private industry to carry out the components of the solid waste system, if feasible.
- encourage cooperative and coordinated efforts among government agencies, private companies and the public to support the goal of sustainable resources for the community.
- be consistent with other existing resource management and local plans.
- incorporate flexibility to accommodate future needs.

These goals are intended to be an expression of the vision for the planning process and the plan itself, as well as providing additional guidance for the long-term (20 years or more) implementation of the plan's recommendations.

1.8 ORGANIZATION OF THE SWMP

This plan is organized into the following additional chapters, each addressing particular elements of the County's solid waste management system:

Chapter 2: Background Information
Chapter 3: Waste Reduction and Public Education
Chapter 4: Recycling
Chapter 5: Composting
Chapter 6: Collection and In-County Transfer
Chapter 7: Disposal
Chapter 8: Regulation and Administration
Chapter 9: Special Wastes

Chapter 2 provides important information about demographics, waste quantities and other factors common to the remaining chapters. The purposes of Chapters 3 through 9 are to:

- review existing programs, activities and policies in Jefferson County and the City of Port Townsend for each element of the solid waste system.
- identify needs, problems, or opportunities not addressed by existing activities and programs.
- examine alternatives to meet the identified needs, problems and opportunities.
- recommend future programs or actions as appropriate to the needs and abilities of the County's and City's residents, businesses and service-providers.
- present implementation schedules and costs for the recommended programs and facilities.

Appendix C contains the UTC Cost Assessment Questionnaire, as required by State law, which is for determining the potential impacts to collection rates. Appendix E contains the SEPA Checklist, again as required by State law, for determining the potential environmental impacts of recommended changes.

1.9 STANDARD NOMENCLATURE USED IN THE SWMP

This SWMP attempts to provide a standardized approach for the use of capitalized letters when referring to government agencies, including:

- City: When capitalized, this refers to the City of Port Townsend. When not capitalized, it refers to cities in general.
- County: When not capitalized, this refers to counties or county authority in general. When capitalized, this refers specifically to Jefferson County. In the latter case, the term may apply to the County government, to the unincorporated area outside of the City, or to the entire County (including the City). Examination of the context may help clarify the exact meaning of the term. In cases where the it is referring to the County government, it could mean either the Public Works Department or Public Health (unless otherwise specified).
- State, Federal and Tribes: These words are almost always capitalized, on the grounds that these almost always refer to a specific state government (Washington State), as well as only referring to specific tribes affected by this SWMP and to a specific national government.

In a similar fashion, "Compost Facility," "Transfer Station," "Recycle Center," "Moderate Risk Waste (or MRW) Facility," and "Drop Box" are capitalized when these are used to refer to specific facilities in Jefferson County.

This SWMP also uses standard nomenclature to distinguish between different types of solid waste and recycling containers. The term "drop box" may be used for solid waste or recycling collection boxes, "dumpsters" refers to the solid waste collection boxes generally used by individual businesses, "containers" generally refers to the large metal boxes used to collect recyclable materials, and "recycling bin" or "totes" refers to the smaller boxes used by households for curbside recycling. Recycling containers used by businesses are generally wheeled and so are called "carts."

This SWMP also attempts to pay careful attention to the use of "should," "shall," and "will." The word "should" is used to denote a guideline or a suggestion, or to recommend a specific course of action. The terms "shall" and "will" are used to denote a stronger obligation, with "will" being the preferred term in this plan for those activities that absolutely must be conducted.

More information about the definitions used in this SWMP can be found in the Glossary.

This page intentionally left blank to facilitate double-sided printing.

CHAPTER 2: BACKGROUND OF THE PLANNING AREA

2.1 INTRODUCTION

This chapter provides background information on the geography, demographics and existing conditions in Jefferson County. This information is required by Ecology and it is also needed in several of the following chapters of this Solid Waste Management Plan (SWMP).

The information in this chapter is organized into three additional sections:

2.2 Description of the Planning Area
2.3 Evaluation of Potential Sites for Solid Waste Facilities
2.4 Quantity and Composition of Solid Waste

2.2 DESCRIPTION OF THE PLANNING AREA

An understanding of the environmental, demographic and land use conditions in Jefferson County is important because it provides a frame of reference for discussions of existing solid waste practices and future solid waste handling needs. To address the primary aspects of these conditions in Jefferson County, this section is divided into two parts: the natural environment and the human environment. The description of the natural environment includes a brief review of topography, geology, soils, and climate. The description of the human environment includes the demographic and land use characteristics of the planning area.

2.2.1 Natural Environment

Overview

Jefferson County is located on the Olympic Peninsula in northwestern Washington State. The County is bordered by the Pacific Ocean to the west, Clallam County to the north, Puget Sound and Hood Canal to the east, and Mason and Grays Harbor Counties to the south. The Olympic Mountains cut through the middle of Jefferson County, forming a significant geographic barrier for east-west travel. The County has a total area of approximately 1,800 square miles.

Topography

The topography of Jefferson County is extremely varied, with a range of elevation from sea level up to almost 8,000 feet. The dominant topographical feature is the Olympic Mountains, which comprises a major portion of the County. These mountains are a densely wooded wilderness with numerous streams and steep slopes. The remaining area of Jefferson County is comprised primarily of rugged foothills and coastal terraces.

Geology and Soils

The Olympic Peninsula is a region of complex geologic history, with several layers of sedimentary, igneous, and metamorphic rocks occurring in a variety of stages of deformation as a result of major

tectonic activity. Repeated glaciation of the area has modified rock formations to create deposits of unconsolidated clay, silt, sand and gravel on much of the lowlands and foothills of the Olympic Peninsula.

Two major bedrock features occur on the Olympic Peninsula: the peripheral rocks and the core rocks. The peripheral rocks are Miocene to Eocene in age and consist of sandstone, argillite, and conglomerate that are layered with basaltic volcanic rocks of the Crescent Formation. The peripheral rocks are folded and faulted. The core rocks are also Miocene to Eocene in age but are much more deformed than the peripheral rocks. Metamorphic lithology and textural characteristics are very common in the core rocks.

Climate

The climate of Jefferson County is primarily maritime in character with cool dry summers and wet mild winters. The Olympic Mountains have the widest range of rainfall in the United States, however, and in Jefferson County the average annual rainfall varies from 19 inches in Port Townsend (in the northeastern corner of the County) to over 130 inches on the western side of the Olympic National Park.

Snowfall is heavy in the mountains and it remains at higher elevations until late in the summer. Little or no snow is experienced at lower elevations during most winters.

2.2.2 Human Environment

Current Population/Demographics

According to the Washington State Office of Financial Management (OFM 2006), the 2006 population of Jefferson County was an estimated 28,200 people. The one city in Jefferson County, Port Townsend, had 8,745 residents in 2005, or 32 percent of the population. Table 2.1 shows the County's population distribution for 1990 and 2000.

Future Population/Demographics

Evaluating growth trends in an area's population is useful in determining future trends in solid waste generation. Table 2.2 shows previous and projected population figures for Jefferson County. As shown in Table 2.2, the population of Jefferson County is expected to increase significantly by 2025. The projected 2025 population of Jefferson County, 40,807 people, represents a 45% increase over the current (2006) population.

A significant portion of the current and future population in Jefferson County is expected to be people who are 65 years old and older. The percentage of people 65 and older is expected to grow from 23.5% in 2005 to 38.3% in 2025 (OFM 2002). Only one county is projected to have a higher percentage in 2025 (San Juan County, at 39.6%). Statewide, the number of people aged 65 and older is expected to increase from 11.3% in 2005 to 18.1% in 2025.

Table 2.1. Jefferson County Population by Area.

	1990[1]	2000	Increase, %
Incorporated Area:			
Port Townsend	7,001	8,334	19.0%
Unincorporated Areas:			
Discovery Bay CCD	3,766	5,735	52.3%
Oak Bay CCD	6,412	8,469	32.0%
Quilcene Bay CCD	2,508	2,818	12.3%
West End CCD	659	597	-9.4%
Subtotal, Unincorporated	13,345	17,619	32.0%
Jefferson County, Total	20,346	25,953	27.6%

Notes:
1. Data for Port Townsend is from the Washington State Office of Financial Management (OFM 2005) and data by Census County Division (CCD) is from the Census Bureau's web page (http://factfinder.census.gov/home/saff/main.html).

Table 2.2. Jefferson County Population Trends.

Year	Total Population[1]	Percent Change[2]
Historical:		
1960	9,639	---
1970	10,661	10.8%
1980	15,965	49.8
1990	20,406	27.8
2000	26,299	28.9
Projected:		
2005	28,308	7.6
2010	30,892	9.1
2015	34,067	10.3
2020	37,483	10.0
2025	40,807	8.9

Notes:
1. Population figures are from "Washington State County Population Projections for Growth Management," OFM 2002.
2. Percent change calculated by dividing the increase from the previous year by the amount in the previous year, and then expressed as a percentage. For the historical data, the percent change represents a ten-year period, but for the projected figures it is only for a five-year period.

Seasonal Population Changes

Jefferson County experiences significant seasonal fluctuations in population for a variety of reasons, but the summer tourist population has especially increased in recent years. There are also a significant amount of seasonal (summertime) residents that are not included in the County's population statistics, but that must be considered since they create additional demand for certain types of programs and facilities during the summer months. According to the 2000 census, 11.9% of the housing units in Jefferson County are seasonal units. Only seven other counties in Washington have a higher percentage of seasonal units (Ferry, Mason, Okanogan, Pacific, Pend Oreille, San Juan and Skamania Counties).

2.2.3 Global Economic and Environmental Trends

Several global trends may have an impact on the factors discussed above and on the programs discussed later in this Plan. Three such trends include:

- global warming,
- increasing oil prices, and
- international shifts in manufacturing activities and demand for raw materials.

It is impossible to predict the exact nature and degree of local impacts that may result from these trends because the magnitude and timing of these trends is highly uncertain. Furthermore, the actual local impacts of these trends could be both positive and negative, and some aspects could even cancel each other out to a degree (at least on a local level).

Global warming

The magnitude and causes of global warming are still being debated at the time of this writing, but there is a growing body of evidence that the world is undergoing some type of climate change. For example, scientists have documented an increase in ocean temperatures, and there is a possibility that this increase contributed to the record number of hurricanes that occurred in 2005. The existing climate models are not predicting such severe storms for Washington State or for Jefferson County, but it's possible that the summers could become longer, hotter and drier than they have been in the past. Even if there were no large changes in Jefferson County, however, impacts to other areas may cause high energy prices and material shortages, such as occurred in the aftermath of the hurricane Katrina (due to the temporary shutdown of oil rigs in the Gulf of Mexico and ports in New Orleans).

One point that should be made about the impact of global warming is that it may lead to more variable weather patterns and severe storms of all types. Increased global temperatures could actually make some areas colder or wetter by changing normal weather patterns. Increased temperatures may provide more energy and thus stronger storms, which on a local level could mean that a single storm could deliver much more rain or snow than previously experienced.

Increasing oil prices

In the long term, the price of petroleum products will increase as the supply of oil shrinks, unless demand shrinks as well. In other words, it is not the point at which the world runs out of oil that is

important, but the point at which supply can no longer keep up with demand. Until recently, it was thought that this point was still at least ten years away, but a combination of factors has led many to predict that this point will be reached much sooner than that, possibly in the next year or two. These factors include increasing demand, over-inflated estimates of reserves, difficulties in extracting the remaining reserves cost-effectively, and inadequate investments in oil production systems. Concerns about future supplies and the economic impacts of increased prices are being raised by many different groups now, including the International Energy Agency (IEA). In addition to concerns about economic impacts of increasing prices, the IEA has raised concerns about the increasing amount of oil production in the Middle East, which now contains two-thirds of the world's oil reserves (WSJ 2005).

The increase in oil prices is one of those trends that could have both positive and negative impacts on Jefferson County's economy and on solid waste programs. Increased gasoline prices will be bad for tourism and industries that depend heavily on shipping. The net impact to solid waste programs could include:

- there could be more or less solid waste generated if tourism or seasonal population patterns are affected,
- higher fuel costs will lead to higher prices for collection and other transportation-based programs, thus making waste export less cost-effective and efficient transfer systems more important,
- recycling could become more or less cost-effective, depending on the competing impacts of transportation costs versus the value of recyclable materials, and
- local composting systems could become more important.

International shifts in manufacturing and demand for raw materials

A large amount of manufacturing capacity has already shifted to China and other countries. Recently, however, there has been increasing recognition in China of the environmental costs of these activities. This and other factors, such as rising fuel costs, make it uncertain whether worldwide shipping practices will continue to be as competitive in the future. Since the United States also ships a large amount of goods and materials to other countries (the U.S. currently still exports more than it imports), rising fuel costs will have a mixed impact on international shipping.

2.3 EVALUATION OF POTENTIAL SITES FOR SOLID WASTE FACILITIES

This SWMP is required to contain the following information to provide guidance for siting new solid waste disposal facilities (RCW 70.95.165). Although State law specifically refers to disposal facilities (landfills and incinerators), these criteria could also be considered in the siting of other solid waste facilities such as transfer stations and compost facilities.

2.3.1 Solid Waste Facility Siting Factors

Soils and Geology

Soils and underlying geology are important considerations for solid waste management facilities. The appropriate type of soil varies somewhat depending on the type of solid waste facility, but any building or other structure must be built upon a stable foundation. The soils in Jefferson County are generally acceptable for foundations.

There are three separate geographic regions in Jefferson County. The eastern portion, known as the Puget Lowland, has been repeatedly invaded by glaciers. This has caused a complicated pattern of sediments, primarily made up of glacial outwash and till (up to 2,000 feet deep in some areas). The western region also has extensive glacial outwash and till deposits, with alluvial deposits in the three major river valleys (for the Hoh, Queets, and Clearwater Rivers). The third region is the Olympic National Park, which contains sedimentary deposits as well as volcanic formations (basalt) or glacial and alluvial deposits in some areas.

Glacial outwash and alluvial deposits are typically loose and highly permeable, whereas glacial till generally has low permeability. All of these deposits could be used for the construction and operation of a landfill, although low-permeability soils are needed in much greater quantities. Low-permeability soils can be used for liners and final cover because these will retard the movement of precipitation, gas and leachate (contaminated water). Porous soils, such as the sands and gravels that typically make up glacial outwash and alluvial deposits, are undesirable because these permit rainfall to enter the landfill (increasing leachate and gas production) and allow the uncontrolled migration of landfill leachate and methane gas. Thus, sand or gravel are not suitable for landfill cover or liners, although gravel can be used for intermediate cover because it provides better traction for landfill machinery in wet weather. Sand and gravel can also be used for gas venting and leachate collection systems.

Given the complicated nature of the soils and geology in Jefferson County, detailed studies will be necessary to evaluate the site(s) for any proposed solid waste disposal facility.

Groundwater

Distance to groundwater, measured in feet or in terms of the time that it takes for water to travel from the surface to the groundwater, is an important consideration for the siting of solid waste facilities. Shallow bodies of groundwater and/or short travel times to the groundwater are a problem due to the risks associated with spills and contaminated runoff from waste facilities. Other factors such as the existing and potential beneficial uses of the groundwater are also significant considerations, especially if the groundwater is, or could be, used for drinking water. A large percentage of the population in Jefferson County depends on private wells for drinking water.

Groundwater must also be considered when siting or designing solid waste facilities because shallow groundwater can result in higher construction and maintenance costs, interfere with excavation, and require special foundations.

Flooding

Areas known to have experienced flooding are not acceptable sites for solid waste facilities. Solid waste facilities often entail risks not associated with other types of development, such as the potential to create contaminated runoff. Additionally, solid waste facilities must remain operational during and after natural disasters such as floods, in order to handle the large amount of debris that may be created.

Solid waste facilities generally cannot be built in an areas designated as "100-year floodplain," which are areas known to be flooded at least once every 100 years. In Jefferson County, these areas are generally adjacent to the major rivers and creeks, or are along the shoreline (of the Pacific Ocean or Puget Sound). Potential sites in these areas are generally also a problem based on other

standards, such as maintaining separation distances from surface waters and the potential value of the land for agriculture and sustainable resource production (timber, groundwater recharge, etc.).

Surface Water

Numerous rivers, creeks and small lakes are present throughout the County. These bodies of water pose a serious constraint for locating solid waste facilities, since the facilities frequently present a possible risk of contamination for surface water. Regulatory standards (WAC 173-351-140) require that new disposal facilities be located more than 200 feet from surface waters, which eliminates a substantial amount of land for a water-rich area such as Jefferson County.

Slope

Much of Jefferson County is mountainous and has steep slopes that pose serious problems for solid waste disposal facilities. Steep slopes pose problems for site development and for future access. The lower valleys and coastal terrace areas have gentler slopes but these areas also have high value for other purposes, such as agriculture and housing.

Cover and Liner Materials

Cover and liner materials are important because their presence on-site at landfills and other disposal facilities will reduce the cost of construction, operation and maintenance. Cover materials are required to ensure that waste materials are securely buried and to prevent gas and odors from being released in an uncontrolled fashion, while liners are needed below the landfill to contain the leachate that is created by decomposing wastes. Desirable materials include silt and clay for liners and cover; sand and gravel for gas venting, leachate collection and road construction; and a variety of other materials that could be used for intermediate cover. As previously discussed under the "soils and geology" subsection of this chapter, many of these soils are present throughout the County. In the absence of naturally-occurring materials, however, synthetic materials can be used.

Capacity

The capacity of a waste disposal facility will obviously affect the number of potential locations that can be used for it. It is generally easier to find an acceptable parcel of land for smaller facilities. Conversely, there are significant economies of scale for all waste disposal facilities, and the base cost per ton for waste brought to a small facility will be much higher than for a larger facility.

Climatic Factors

Much of Jefferson County receives high amounts of precipitation, which poses serious problems for landfills due to the potential for generating large quantities of leachate. Other types of solid waste handling facilities are less affected, but all facilities must be designed and operated to avoid contamination of surface waters by runoff. The eastern side of the County, especially in the area of Port Townsend, receives lower amounts of rainfall, but much of the land in this area has considerable value for other purposes (agricultural and residential usage).

Land Use

Existing land use in Jefferson County ranges from the relatively intense residential, commercial and industrial development in the Port Townsend area, to the undeveloped land and forests of the Olympic Mountains. Well over half of Jefferson County's land area is under Federal ownership.

The Jefferson County Board of County Commissioners adopted a Comprehensive Land Use Plan in the fall of 1998, and that plan was amended in 2004. The Jefferson County Comprehensive Land Use Plan and subsequent development regulations are the tools for designation of land use. The development regulations will ensure that development occurs in a way that protects private property rights and existing land uses while also protecting natural resources, promoting economic growth, and assuring the compatibility of proposed land uses with existing ones.

The City of Port Townsend has also adopted a land use plan (PT 1996). Although this plan has less bearing on siting solid waste disposal facilities (since it is less likely that a landfill or other disposal facility would be located within the City's boundaries), it could apply to transfer stations, compost facilities, or other solid waste processing/handling facilities.

In addition to potential impacts on facility siting, urban-rural designations also affect solid waste service levels. State planning guidelines require that service levels be adjusted for urban and rural conditions (see pages 4-2 and 4-3). As indicated in Chapter 4, the designation of urban areas for solid waste services is contingent upon the UGAs defined by the County's comprehensive land use planning efforts. Hence, the adoption of any one of the proposed alternatives discussed above (other than a "no-action" alternative) or other modifications in the designation of UGAs may require changes in solid waste services.

Air Emissions and Air Quality

Siting and operating a new landfill or other solid waste facility could impact air quality. Dust, gases, odors, particulates and vehicle emissions are all potentially increased by landfills and other disposal operations. In certain cases, however, the centralization of such emissions may be preferable to the impacts caused by other disposal options. Any proposal will need to be examined by the Olympic Region Clean Air Agency (ORCAA) for impacts to air quality.

Summary of Siting Factors

Based on the above discussion of siting factors, it can be concluded that only limited portions of Jefferson County would be available for siting a new solid waste facility. Much of the County is designated as national park and forest, and also has severe slope problems. In the western half of the County, disposal facilities would need to rely on extraordinary measures to manage the high amounts of rainfall received. The eastern half is more populated and is useful for other purposes.

2.3.2 Solid Waste Landfill Siting Process

Any new facilities developed in the future will have to meet the State and local standards current at that time. State standards include the Solid Waste Handling Standards (Ch. 173-350 WAC) and the Criteria for Municipal Solid Waste Landfills (Ch. 173-351 WAC). Local standards include the

Jefferson County Comprehensive Land Use Plan (JC 2004) and zoning codes. The siting process for disposal facilities could include the following steps:

Step 1: Site Identification

For a public disposal facility, the process of identifying sites may include soliciting nominations from citizens and interested parties, identification of major landholders and City/County properties, and other activities to initially identify as many sites as practical. For a private site, the site selection process may consist primarily of an inventory of sites currently owned or available for purchase.

Step 2: Broad Site Screening

The second step typically involves evaluating potential sites for "fatal flaws," such as unsuitable neighboring land use, distance from the point of waste generation, site size, steep slopes, floodplain area, wetlands, surface water or shorelines. For a public site, the goal might be to retain up to 12 sites after this step is completed. For a private facility or other cases where there may be only a few sites to begin with, only one or two sites need to survive this evaluation.

Step 3: Detailed Site Ranking

After sites with fatal flaws have been eliminated, the remaining sites should be evaluated against more detailed criteria such as the availability of utilities (water, sewer, electricity), traffic impacts and road access, and other factors affecting the ability to develop and use the site. For a public effort, no more than four sites should remain after this step is completed.

Step 4: Detailed Site Evaluation

The final step in evaluating potential sites involves a detailed environmental investigation to assess environmental impacts, in accordance with the State Environmental Policy Act (SEPA). This step should result in the recommendation of a preferred site.

Step 5: Siting Decision

Finally, the decision to proceed with a recommended site should be based on environmental, engineering, financial and political factors, and then more detailed plans can be developed and the permitting process can begin.

2.4 QUANTITY AND COMPOSITION OF SOLID WASTE

An estimate of the composition and future quantities of solid waste in Jefferson County is necessary to provide the basis for determining solid waste handling needs for the next twenty years.

The total waste stream for Jefferson County consists of many types of wastes. Most of the County's wastes are handled through the Jefferson County Waste Management Facility and transported to a regional landfill in Klickitat County, Washington. A portion of the waste stream is handled through other means. Waste from commercial sources may end up in other disposal systems, including waste from the Port Townsend Paper Company (which has its own waste hauler) and construction debris (where recycling opportunities may be available in other areas).

Individuals may bring their waste to facilities in other counties, especially residents in western Jefferson County where a local disposal facility is no longer available.

This SWMP focuses primarily on "Municipal Solid Waste" (MSW), which are those wastes generated by residential and commercial sources and that are meant to be handled through the County's solid waste disposal system. Wastes generated by industrial and agricultural sources are generally included to the extent that these are similar to what is disposed through the County's system and they don't require special handling, but special wastes handled separately by these sources may only be addressed briefly in this SWMP.

2.4.1 Current and Future Solid Waste Quantities

Information on the current (2005) municipal solid waste quantities was provided by County staff from the records of the Jefferson County Waste Management Facility and Ecology staff (for the amounts recycled and diverted from disposal). This information is summarized in Table 2.3.

Table 2.3. Solid Waste Quantities in 2005.

Source / Site	Annual Tons[1]		Percent of Total[2]
Jefferson County Waste Management Facility (JCWMF):			
City of Port Townsend	5,447	tons	26.2%
Murrey's Olympic Disposal	5,550	tons	26.7%
Self-Haul to JCWMF	9,611	tons	46.2%
Total JCWMF Amount	20,608	tons	99.1%
Drop Boxes:			
Quilcene Drop Box	192	tons	0.9%
Total Waste Disposed[3]	20,800	tons	100%
Recycled Amount	21,745	tons	
Diverted Amount	4,645	tons	
Total Waste Generated	47,190	tons	
Population (2005)	27,600	people	
Per Capita Disposal Rate	0.75 tons per person per year or 1,507 pounds per person per year or 4.13 pounds per person per day		
Per Capita Generation Rate	1.71 tons per person per year or 9.37 pounds per person per day		

Notes:
1. Annual tons for JCWMF and the Quilcene Drop Box are from data provided by County staff, data for the amounts recycled and diverted are from Table 2.6, and other figures are derived from this data.
2. Percent of total shown is for disposed amounts only.
3. "Total waste disposed" does not include special or other wastes that are disposed at facilities outside of County system.

The figures in Table 2.3 do not include the special wastes that are handled separately from the municipal solid waste stream or the waste amounts that are exported to out-of-county facilities. For instance, these figures do not include the ash generated by Port Townsend Paper Company (which goes to a separate landfill) or agricultural wastes such as crop residues that are returned to the land.

The rate at which solid waste is generated varies throughout the year due to seasonal activities. Data from transfer station records shows that the amount of solid waste disposed in any one month in 2005 varied from a minimum of 1,398 tons in January to a maximum of 2,059 tons in August (see Figure 2.1). This pattern is evidence of the impact of tourism on the County's solid waste system, as most other communities experience their maximum monthly tonnage in the spring or fall, with the summer months being lower or about average.

In Table 2.4, waste quantities have been projected using the current per capita generation rate multiplied by population forecasts for the County. By using the current per capita rate without adjustments, the projected figures assume no change in the percentage of material recycled and reduced. While it could be assumed that the percentage of recycling will increase and that waste reduction will further decrease the amount of waste that is disposed, the projections shown in Table 2.4 provide a conservative baseline estimate for planning purposes. This approach also assumes no

Table 2.4. Projected Solid Waste Tonnages.

Year	Total Population[1]	Waste Generated[2]	Waste Generation Rate	Amount Recycled[3]	Amount Diverted[3]	Amount Disposed[4]
Actual Amounts:						
2005	27,600	47,190	9.37	21,745	4,645	20,800
Projected Amounts:						
2006	28,200	48,200	9.37	22,220	4,700	21,300
2007	28,870	49,400	9.37	22,750	4,800	21,900
2008	29,550	50,500	9.37	23,290	4,900	22,300
2009	30,220	51,700	9.37	23,800	5,100	22,800
2010	30,890	52,800	9.37	24,340	5,200	23,400
2015	34,100	58,200	9.37	26,850	5,700	25,800
2020	37,500	64,100	9.37	29,530	6,300	28,300
2025	40,800	69,800	9.37	32,160	6,800	30,800

Notes:
All figures, except the year and population, are tons per year (TPY).

1. Population figures for most years are from the Office of Financial Management (OFM 2002 and OFM 2006). Figures for 2007, 2008 and 2009 are interpolated.
2. For 2005, the amount of waste generated was determined by adding the recycled, diverted and disposed tonnages. Projected waste generation figures for 2006 through 2025 are based on the waste generation rate for 2005 (9.37 pounds per person per day) and population forecasts.
3. For 2005, recycled and diverted tonnages are from Ecology's annual recycling rate survey, and disposal tonnages are from county records. Projected tonnages for the years 2006 through 2025 for recycled and diverted materials assume the same percentage of recycling and diversion as in 2005 (46.1% and 9.8%, respectively), as a percentage of the amount of waste generated.
4. The amount of waste disposed for 2005 is based on county records, and projected figures for 2006 through 2025 assume the same percentage of waste disposal (44.1%), as a percentage of the amount of waste generated.

change in the amount of waste migrating to out-of-county facilities and other factors such as tourism remaining proportionate to increases in the general population.

2.4.2 Solid Waste Composition

Composition data is useful for designing solid waste handling and disposal programs. No waste composition study has been performed in Jefferson County to date, but a waste composition study was conducted for Clallam County in 2003 (GS 2003). This study divided the waste stream into seven categories based on source of waste and 88 categories of materials.

The solid waste composition figures shown in Table 2.5 are typical of the waste streams in many areas, but the figures are only an approximation of Jefferson County's waste stream. For instance, this data does not reflect local differences caused by specific recycling programs or by regulations such as Port Townsend's polystyrene ban (see Section 3.3.3). Prior to any major investments that depend on the composition of the waste stream, such as a solid waste composting or other processing facility, an actual waste composition study should be conducted in Jefferson County.

Waste composition can be expected to change in the future due to changes in consumption patterns, packaging methods, disposal habits, tourism and other factors. These changes are very difficult to predict in the long term. Furthermore, implementation of this SWMP is expected to affect waste composition in Jefferson County by changing purchasing and disposal habits.

2.4.3 Current Recycling Levels

The most recent recycling survey conducted by Ecology shows that 46.1% of Jefferson County's waste stream is currently recycled and composted (see Table 2.6). This figure is generally called a "recycling rate," although it includes composting and some reuse as well. The figure is based on 21,745 tons reported as being recycled and composted in 2005, versus a total of 47,190 tons of waste generated (i.e., waste that is disposed, recycled, and handled through other methods). Data for some materials is not reported to the Department of Ecology by some companies and hence is not shown in Table 2.6. A significant amount of the tonnage included in the recycling rate is being handled through Jefferson County's Recycle Center and Port Townsend's Biosolids Compost Facility. There are also other recycling operations in the County that are, in many cases, capturing other materials not normally handled by public facilities.

Figures shown in Table 2.6 include several materials that are not included in the definition of "recycling" and so cannot be included in the calculation of the recycling rate. These "diverted" materials, including materials burned for energy recovery, asphalt, concrete and other building materials, are still being put to a beneficial use but simply don't "count" as recycling. In 2005 in Jefferson County, there was a large amount of asphalt and concrete that was crushed for reuse but this amount cannot be included in the calculation of the recycling rate. If all of the diverted materials could be counted in the recycling rate, the rate would be 56%.

There is little date available on the current levels of waste diverted by most forms of waste reduction, although a few categories of reuse (especially textiles and building materials) are at least partially tracked. If all waste reduction activities and the missing recycling tonnages could be accounted for, the County's current diversion rate would be significantly greater.

Table 2.5. Estimated Solid Waste Composition in Jefferson County.

Material	Entire Waste Stream		Typical Composition of Select Waste Streams, % by Wt.[1]			
	Percent by Weight[1]	Tons of Material[2]	Residential	Residential Self-Haul	Commercial	Construction /Demolition
Paper	**19.9**	**4,139**	**21.4%**	**20.6%**	**24.9%**	**6.7%**
Newspaper	1.9	400	3.3	1.1	2.1	0
Cardboard	3.9	802	3.1	3.7	5.1	3.2
High-Grade Paper	1.0	214	0.9	1.3	1.4	0
Low-Grade Paper	5.3	1,101	6.3	4.1	7.0	0.3
Other Paper	7.8	1,622	7.8	10.4	9.4	3.1
Plastic	**12.9**	**2,685**	**11.8**	**11.8**	**14.7**	**4.9**
PET Containers	1.2	240	1.1	0.4	1.3	0.1
HDPE Containers	1.1	228	1.3	1.2	0.9	0
Film and Bags	4.8	992	4.8	2.7	6.8	1.8
Other Plastics	5.8	1,225	4.7	7.5	5.6	3.0
Glass	**3.6**	**740**	**4.6**	**5.0**	**3.9**	**0.1**
Clear Containers	1.8	384	2.3	2.7	2.0	0.1
Green Containers	0.5	112	0.6	0.9	0.7	0
Brown Containers	0.9	192	1.3	0.9	1.0	0
Other Glass	0.4	52	0.4	0.5	0.2	0
Metals	**7.2**	**1,494**	**6.4**	**7.7**	**7.4**	**5.8**
Aluminum Cans	0.9	189	0.9	0.8	0.8	0
Tin Cans	1.6	338	2.1	1.6	1.1	0.1
Mixed Metals	1.8	371	2.2	2.7	1.6	0.1
White/Brown Goods	0.8	170	0	0	1.6	3.6
Other Ferrous	1.8	373	1.0	2.2	2.1	1.9
Other Non-Ferrous	0.3	52	0.2	0.4	0.2	0
Organics, Other	**42.4**	**8,824**	**52.8**	**40.1**	**41.5**	**5.7**
Food Waste	15.4	3,196	18.5	20.0	19.2	0.8
Yard Debris	3.1	646	6.9	2.7	2.2	0
Disposable Diapers	2.2	463	3.9	1.4	2.2	0
Textiles, Shoes	3.2	669	5.2	3.7	2.1	0.1
Tires and Rubber Products	0.6	115	1.0	0	0.6	0
Hazardous/Special Wastes	1.0	205	0.6	1.7	1.0	0
Other Materials	16.9	3,529	16.8	10.7	14.6	4.8
Construction Debris	**14.0**	**2,918**	**3.0**	**14.8**	**7.3**	**76.8**
Wood Waste	7.5	1,556	1.4	10.3	5.8	28.1
Construction Debris	6.6	1,362	1.6	4.5	1.5	48.8
TOTAL TONS DISPOSED =		20,800				

Notes:
1. From the "Clallam County Solid Waste Composition Study," June 2003.
2. Based on the 2005 tonnage for Jefferson County (20,800 tons) and percentages shown in the column to the left.

Table 2.6. Recycled and Composted Quantities by Material.

Material	Tons Recycled, 2005
Aluminum Cans	47
Cardboard	NA [1]
Electronics	20
Fluorescent Light Bulbs	1
Food Waste	630
Glass	NA
Grease, Other Rendering	NA
HDPE Bottles	NA
Metals/White Goods	2,849
Mixed Waste Paper	NA
Newspaper	NA
Office Paper	NA
Paint	NA
PET Bottles	NA
Tin Cans	NA
Tires	NA
Used Oil	NA
Vehicle Batteries	61
Miscellaneous	1.3
Yard Waste	13,835
Tons Recycled/Composted	21,745
Antifreeze	26
Asphalt/Concrete	NA
Const./Demo/Land Clearing	NA
Oil Filters	NA
Oil for Energy Recovery	NA
Tires for Energy Recovery	NA
Wood for Energy Recovery	234
Tons Diverted	4,645
Tons Disposed	20,800
Total Tons Generated	47,190
Recycling/Composting Rate	46.1%

Notes:
Data is from the 2005 Recycling Survey prepared by Ecology.
1. NA = not available. Quantity figures for materials with only one or two respondents are not shown in the above table in order to protect the confidentiality of the survey participants.

CHAPTER 3: WASTE REDUCTION AND PUBLIC EDUCATION

3.1 INTRODUCTION

The solid waste management activities discussed in this chapter are organized into three sections:

3.2 Preface to the Waste Reduction, Recycling and Composting Chapters
3.3 Waste Reduction
3.4 Public Education

The preface to this and the next two chapters is provided here because there is background information that is common to all three of the waste diversion techniques (waste reduction, recycling and composting). Public education is also common to the three techniques, and so general public education methods are discussed at the end of this chapter.

3.2 PREFACE TO THE WASTE REDUCTION, RECYCLING AND COMPOSTING CHAPTERS

3.2.1 Introduction

This chapter, and the following two chapters on recycling and composting, describes existing programs and future plans for activities that reduce the amount of solid waste being generated or disposed in Jefferson County. This chapter discusses waste reduction methods that reduce the amount of waste being generated while the next two chapters discuss methods that reduce the amounts being disposed. In other words, waste reduction methods prevent materials from becoming wastes, while recycling and composting address materials that have been created as a waste. Collectively, these approaches (waste reduction, recycling and composting) are known as "waste diversion" in this plan.

3.2.2 Purpose

Chapters 3, 4 and 5 provide an update of the County's waste diversion methods and comply with State requirements regarding waste reduction and recycling opportunities and programs. The State requirements are based in the "Waste Not Washington" Act (ESHB 1671), which are in turn reflected in various sections of the Revised Code of Washington (RCW) and the Washington Administrative Codes (WACs). The Waste Not Washington Act declared that waste reduction and recycling must become a fundamental strategy of solid waste management. To that end, the following goals (among others) were developed and included in RCW 70.95 as the basis for solid waste planning in Washington State:

- Washington State was to achieve a statewide recycling and composting rate of 50% by 1995 (now 2007).
- there is a statewide goal to eliminate yard debris from landfills by 2012 in those areas where alternatives exist.
- source separation of waste (at a minimum, separation into recyclable and non-recyclable fractions) must be a fundamental strategy of solid waste management.

- steps should be taken to make recycling at least as affordable and convenient to the ratepayer as mixed waste disposal.

RCW 70.95 requires that solid waste management plans demonstrate how the above goals will be met.

3.2.3 Waste Diversion Goals

The State's goal is to reach 50% recycling and composting by 2007. The current (2005) statewide recycling rate is 44%. RCW 70.95 does not mandate that each county or city adopt a 50% goal, however, since it is recognized that less-populated areas have greater barriers to cost-effective collection and marketing of recyclable materials. Each community is required to set a goal that suits its situation, provided that the goal is based on justified and sound reasoning. RCW 70.95.090 explicitly recognizes that different levels of collection service are appropriate for urban and rural areas.

The State's goal is for recycling and composting only, but this Solid Waste Management Plan (SWMP) addresses an overall goal for waste diversion that also includes waste reduction and other materials that do not officially count towards the recycling rate. In the calculation of the statewide recycling rate, some materials cannot be included by Ecology because the statutory definition of recycling does not include those materials. In the case of activities such as waste oil used for heating purposes (incineration), it is understandable that some of the activities do not count as "recycling." per se, although burning oil for heating purposes is still a beneficial use. In other cases, such as recycling of asphalt and concrete, it is really only an issue of definitions that prevent the materials from being counted as recycling. In Jefferson County, the recycling rate is 46.1% (see Table 2.6) using the state definition of recycling and composting. Using the broader definition of waste diversion, the rate would be 56%, with most of the additional amount being contributed by asphalt and concrete that is being crushed for reuse.

After discussion by the Jefferson County Solid Waste Advisory Committee (SWAC) of the current progress and future needs, the County's recycling goal has been has been set at 50%. This is a countywide figure that includes the waste diversion efforts in the City as well as the unincorporated areas. The County's recycling goal is intended to include recycling, composting and waste reduction, and sub-goals for these components have been established for monitoring and evaluation purposes:

- recycling = 20%,
- composting = 30%, and
- waste reduction = maintain a constant or decreasing disposal rate.

The County's progress towards meeting this goal should be monitored primarily through the annual recycling survey conducted by Ecology, supplemented with local data as available and appropriate.

3.2.4 The State's Beyond Waste Plan

Another relevant source of guidance on policies and goals is the Washington State Hazardous Waste Management Plan and Solid Waste Management Plan (Ecology 2004a). Commonly referred

to as the "Beyond Waste plan," this plan adopts a vision that society can transition to a point where waste is viewed as inefficient and most wastes have been eliminated. This transition is expected to take 20-30 years or more. In the short term (over the next five years), the Beyond Waste plan focuses on five areas: industrial waste, small volume hazardous waste, organic materials, green building, and measuring progress. The Beyond Waste plan provides recommendations for actions that can be undertaken in the next five-years to achieve the goals in each of these five areas (or initiatives).

The Beyond Waste plan is discussed in greater detail in several places of this SWMP as appropriate to the topics in each chapter. Copies of the Beyond Waste plan can also be downloaded from the Department of Ecology web site (http://www.ecy.wa.gov/).

3.2.5 Sustainability

A significant issue common to waste reduction, recycling and composting is "sustainability". This can be defined as "the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs" (SN 2000). Many citizen-based sustainability initiatives have appeared in the last few years in areas throughout Washington State, including Bainbridge Island, Seattle, Bellingham and, recently, Jefferson County. These initiatives are similar in their goals and focus in part on energy and resource conservation programs. There are several opportunities afforded the County by working in partnership with citizen-led initiatives such as:

- there is an inherent cost-effectiveness to engaging citizen volunteers in promoting the County's reduction and reuse message.
- program development that involves or is driven by citizen volunteers is naturally tailored for and promoted by the demographic it intends to serve.
- sustainability initiatives tend to utilize a "long view" planning process that could benefit solid Waste program design.
- sustainability initiatives incorporate a diversity of viewpoints and in fact see this diversity as a resource. Solid Waste program design that is informed by this diversity of opinion could reach a larger audience and/or provide a better service to a larger number of users.
- partnering with citizen-led sustainability initiatives could create a sense of community ownership around jointly developed programs, which might make such programs more viable initially and provide for a sustained participation rate.

For all these reasons, the SWAC recommends that the Department of Public Works and Environmental Health Division maintain an ongoing dialogue with community organizations working on sustainability issues and to encourage participation in or co-development of programs that promote the message of "Reduce, Reuse, Recycle."

3.3 WASTE REDUCTION

3.3.1 Existing Conditions for Waste Reduction

Waste reduction is the highest priority for solid waste management according to RCW 70.95, and is preferred over recycling and composting because the social, environmental and economic costs are

typically lower for waste reduction. All three methods avoid the cost of disposing of the diverted materials as garbage, but recycling and composting frequently require significant additional expenses for collecting and processing the materials. Those additional expenses are avoided in the case of waste reduction, where the waste is not produced.

Activities and practices that reduce the amount of wastes that are created are classified as "waste reduction." Waste reduction differs from the other two waste diversion techniques (recycling and composting) because the other methods deal with wastes after the wastes have been generated. By definition, waste reduction also includes activities and practices that reduce the toxicity of wastes that are created, but these methods are discussed in other parts of this plan (see Section 9.8) and in the Jefferson County Hazardous Waste Management Plan (PSR 1991).

Several good examples of waste reduction activities exist in Jefferson County. Waste reduction through reuse activity also occurs at second-hand and thrift shops, garage sales, used bookstores, and through similar activities. Jefferson County will continue education regarding existing recycling programs to meet the Beyond Waste goals. Jefferson County will also continue to implement the Green Business and the EnviroStar Programs to encourage solid and hazardous waste reduction.

Schools throughout the County have incorporated waste reduction and recycling programs into their curriculum to varying degrees. Many elementary and high school classes have received waste prevention presentations. Chimacum Elementary, Mountain View School and the Quilcene Schools have had presentations to the entire student body. Presentations to staff have occurred in the past year (the 2006-2007 school year) at the Chimacum Main Campus, Chimacum Creek Primary, Quilcene School District, and Port Townsend High School. Students and staff at Chimacum Schools have been surveyed about their waste prevention habits and several schools in East Jefferson County have been invited to become part of the County's Green Business Program and to participate in the annual EarthDay EveryDay celebration. Currently, classroom presentations are in the scope of work for the Waste Prevention Education Coordinator.

A successful and effective tool for encouraging waste reduction (and recycling) is the use of "variable rates" or "volume-based rates," where households are charged significantly more for disposing of more garbage. Businesses are generally already charged according to the amount of garbage disposed and this approach is essentially impossible to implement for individual apartments, so this strategy typically refers only to single-family homes. The City of Port Townsend uses this approach (see Chapter 6 for more details on collection rates). Avid recyclers or households that minimize waste can also choose a "mini-can" rate (20-gallon can emptied once per week) for $18.42 every two months or every-other-week collection of one can of waste for $14.74 every two months (rates shown are for Murrey's Olympic Disposal). This approach helps to encourage both waste reduction and recycling.

Volume-based rates are also currently provided in other parts of the County. The certificated (franchise) haulers for these areas charge a higher fee as the number of garbage cans set out each week increases. In this case, the increase for each additional can is less than the cost of the first can, so the incentive to reduce the amount of waste disposed is not quite as great as it is in Port Townsend. These rates, which are approved by the Washington Utilities and Transportation Commission (UTC), are based on cost of service, where part of the expense of providing service to each household is fixed and so is independent of the amount of waste set out. A mini-can rate is not offered in the unincorporated areas of the county, but the hauler provides service for one can every-other-week or once-monthly, and this is an additional method to provide incentive to reduce the amount of garbage generated.

An effective method of waste reduction is the composting of yard debris on the property where it was generated (typically called "backyard" or "on-site" composting). The County's Waste Prevention Education Coordinator has provided educational materials for on-site composting in the past through grants obtained from Ecology, and is currently available to answer composting questions. Port Townsend also collects yard debris for processing at the Biosolids Compost Facility (see Chapter 5).

Other opportunities for reuse and waste reduction that are available in the County include a private reuse store for building materials, reuse of polystyrene packing "peanuts" and boxes, and a reuse shelf for paints and other households products at the Moderate Risk Waste Facility (see also Section 9.8). Cellular phones and rechargeable batteries are collected at the MRW facility and at several businesses. Computer refurbishment and reuse has been facilitated by at least two businesses.

3.3.2 Needs and Opportunities for Waste Reduction

Additional opportunities exist to reduce the waste stream through rate structure changes, commercial education and assistance programs, public agency procurement policies, on-site composting programs, manufacturer responsibility requirements, and waste exchanges. These are discussed more fully in the next section on alternative methods for waste reduction.

Solid waste education has a need to be targeted on specific solid waste streams, such as junk vehicles, food waste, construction debris, bulky waste, vehicle tires, white goods, other large appliances, and pharmaceuticals.

A significant need is to be able to measure the results of waste reduction activities. This would be desirable to demonstrate progress towards meeting a waste reduction goal and to evaluate various efforts made in reaching that goal. Quantitative measurement of waste reduction is very difficult, however, and for most or all activities it is necessary to use other measures of success.

3.3.3 Alternative Methods for Waste Reduction

The County's overall diversion goal (50%) will be achieved by reducing, recycling and composting waste. Data is available on recycling and composting results, but it will also be important for the County to estimate the amount of material being handled through waste reduction in order to monitor progress in meeting this goal. Two possible options for measuring waste reduction results are tracking changes in per capita waste generation rates and performance-based standards.

Measuring changes in per capita waste generation rates is very difficult to do in a meaningful manner. There are many factors that can affect the apparent waste generation rate, including economic cycles, changes in the number or type of businesses, tourism, large storms or other natural disasters. These other factors can mask or exaggerate the changes that might otherwise be achieved by waste reduction programs. One study (MOEA 1998) that examined these issues concluded that waste quantities can "naturally" vary by ten to fifteen percent, with only a loose correlation to economic factors, thus masking waste reduction goals that are typically about five percent.

A more effective approach to measurement may be to gauge success in waste reduction by a "performance-based standard," where waste reduction is presumed to be successful based on

achieving a specific level of effort or on another criteria. An example of this approach is to use the number of backyard composting bins that might be distributed as a measure of the amount of yard debris that is kept out of the waste stream. Another option is to conduct surveys of businesses and residents about waste reduction practices, and then project results based on the number of businesses or residents who state that they are actively practicing a specific waste reduction activity. Other criteria can be used and these need to be tailored to each specific waste reduction activity.

Collection rates in the unincorporated areas of the County are regulated by the UTC. These rates are required to be cost-based, and so must reflect the actual costs of providing garbage collection services. This means the rate for two or three cans of garbage per week is not proportionately greater than the rate for single-can service, because the cost to pick up additional cans is not as much as the cost of picking up the first can. Other approaches to charging for garbage collection services in the unincorporated areas could provide better incentives for waste reduction and recycling (see Section 6.2.3).

Some progress has already been made in implementing waste reduction activities in County and City offices, but participation is currently sporadic and more could be done in this area. One method of improving the results of these programs would be to increase participation through written policies. For instance, written procurement policies could be adopted for each office, or through the County or City as a whole. Policies could also be adopted addressing sharing and repairing equipment, and other waste reduction and reuse activities. County and City leadership in these "in-house" programs is needed to provide models for businesses and organizations.

Other potential waste reduction strategies would need to be implemented on a statewide or federal level to be effective. These activities include "bottle bills" (which would require deposits on bottles and cans, presumably leading to some reuse or at least recycling of these containers), "manufacturer responsibility" bills (similar in impact to bottle bills but covering other materials), and "packaging legislation" (requiring minimization of packaging). The City of Port Townsend successfully implemented a ban on carryout polystyrene packaging (Styrofoam) because this packaging does not easily decompose. Deposits could also be placed on materials such as glass and plastic bottles at a local level, but this approach would not be popular and would not work as well as a statewide deposit system.

Local support for these kinds of policies can help encourage State and Federal action to initiate the necessary legislation. The City and County could support State and/or Federal programs through resolutions or ordinances.

Waste reduction of yard debris can be accomplished through backyard or on-site composting, mulching (leaving grass clippings on the lawn) and related techniques. One or more demonstration gardens could be a valuable tool for educating residents about these techniques.

Other types of composting can also be encouraged, such as handling food waste through the use of worm bins. This was previously attempted by the Grant Street School, which participated in a worm bin pilot project with the County in 1992, and a citizen-initiated pilot project was operated at the Mountain View School in 1998.

Waste reduction goals were reviewed by the Jefferson County SWAC for this plan update, and the following were either re-affirmed or added (the last item in the following list is a new goal):

- Great interest was shown by the SWAC in continuing to support and, in fact, create more and better methods of reuse and to publicize existing opportunities throughout the County and City.

Some of the activities that could be accomplished include more opportunities for purchasing durable goods, repairing instead of replacing goods, a comprehensive reuse network available to County residents, a reuse center in the current recycling building, and pulling reusable goods from the solid waste.

- Interest and support was also expressed for in-house waste reduction programs for City and County agencies, businesses and industries, and State and or Federal programs.
- Education for on-site composting was viewed as a priority.
- Support was expressed for rate structure changes that encourage waste reduction and recycling.
- Product labeling for recycled content and recyclability was given the widest support, and programs such as deposit legislation, product and packaging prohibitions, standardized packaging and product use, and reuse standards were also supported. The existing Port Townsend legislation banning the use of carryout polystyrene containers was supported.
- Proactive education campaigns or programs were also viewed as a priority.

3.3.4 Recommendations for Waste Reduction

The recommendations for waste reduction are:

WR1) County and City staff, with the SWAC's assistance, will periodically re-evaluate the County's overall goal for waste diversion and its components, including waste reduction.

WR2) The County and SWAC will continue to investigate procedures for estimating the effectiveness of the waste reduction programs.

WR3) County solid waste staff, with the assistance of the SWAC and other members of the community, will continue to research and promote options for reuse, including but not limited to, brochures advertising local opportunities (including thrift and secondhand stores), reuse at the County's Moderate Risk Waste Facility, expanded presence in the local media, and expanded use of County and City web sites.

WR4) The County and City need to expand in-house waste reduction, recycling and procurement programs. Providing education, leadership and other assistance to businesses to implement similar programs will also be pursued.

See also the recommendations for the overall waste diversion goal (Recommendation R1), for promoting on-site or backyard composting (PE5), for volume-based rates to encourage waste diversion (WC1), and for promoting reuse of construction waste (S5 and S7).

3.3.5 Implementation Schedules and Costs for Waste Reduction

The County's overall goal for waste diversion should be re-evaluated by County and City staff, with the assistance of the SWAC, during the next five years. Investigating procedures for evaluating the effectiveness of waste reduction programs should be conducted periodically by County staff and the SWAC. Both of these recommendations will require a small amount of staff time (for existing staff) and incidental other expenses.

The third recommendation shown above is for ongoing efforts to promote or consider various activities. The cost for implementing this recommendation includes a significant amount of staff time and other expenses for promoting various activities, but funds for these costs are already included in the County's budget (funding these activities also relies on CPG funds from Ecology).

The expansion of in-house waste reduction, recycling and procurement programs for City and County offices should be accomplished by December 2008. The costs for this recommendation will be primarily a small amount of staff time (for existing staff).

Recommendation WR3 has been given a high priority for implementation, WR2 and WR4 have a medium priority, and WR1 has a low priority (see also Tables E.1 through E.3).

3.4 PUBLIC EDUCATION

3.4.1 Existing Conditions for Public Education

Public education activities are presently being conducted by Public Health staff. The Waste Prevention Education Coordinator position and the education program are currently funded primarily by the Department of Ecology (through grants), with matching funds provided by Jefferson County Department of Public Works (a 25% match is provided from revenues from the tipping fees at the transfer station).

Recent activities conducted by the Waste Prevention Education Coordinator include distributing over 1,000 household hazardous waste stickers to residents and distributing other information about the MRW facility. In 2006 and early 2007, two waste-related programs were aired as episodes of the "Many Faces of Public Health" series on PTTV. The first program showcased certified Green and EnviroStars Businesses. The second program included visits to the MRW Facility, the Recycle Center, and the Port Townsend Paper Corporation's corrugated cardboard recycling facility, and it included interviews with the staff of these facilities. A third video featuring the efforts of local school children is planned for later in 2007.

Through the solid waste contractor, the City of Port Townsend contracts for residential education services and provides occasional messages on utility mailings regarding garbage and recycling issues in the city. The certificated haulers also provide information on rates and recycling programs in the unincorporated County collection areas. A law passed in 2001 (WAC 480-70-361(7)) requires solid waste collection companies to inform customers at least once per year about solid waste and recycling services that are available.

3.4.2 Needs and Opportunities for Public Education

Education programs are critical to the success of any solid waste program. To be effective, public education methods need to be tailored to specific groups and programs. More comprehensive education about waste diversion options for residents and businesses, including the availability and requirements for curbside recycling, is needed.

The County's primary funding sources for education programs are grants and a portion of the tipping fee. The use of tipping fees is not considered to be reliable in the long term due to increasing pressure to pay higher costs while maintaining the tip fee at a competitive level. The grant funds are protected but this also means that there is little accountability required for the

effectiveness of expenditures and public education activities. More monitoring and evaluation of the effectiveness and priorities of public education activities needs to be conducted.

Another public education need is to inform residents and businesses as to the proper handling of specific materials, especially for the hazardous or toxic wastes that should be brought to the County's Moderate Risk Waste (MRW) Facility instead of being brought to the Transfer Station or the Quilcene Drop Box. Customers occasionally bring inappropriate materials to these disposal facilities and then need to be re-directed to the MRW Facility, whereas better communication about disposal requirements for these types of wastes might result in more efficient and satisfactory services.

Several opportunities exist for public education activities, including:

- continued use of public access television.
- promotion of waste prevention strategies.
- targeting particular groups, such as businesses or legislators.
- educational materials on costs/benefits of various waste reduction activities or methods.
- information on the fate of recycled materials and the benefits of purchasing recycled products.
- educational materials on how waste diversion activities fit into broader issues, such as sustainability, global warming and preservation of salmon habitat.
- the existing e-waste system and upcoming new rules (when details are available) need to be publicized.

3.4.3 Alternative Methods for Public Education

Options for public education are many and varied, as are the costs and effectiveness of the options. The challenges involved with public and school education programs include the diversity of the public targeted for the information, the multiple programs that compete for public attention, and the potential high costs of an aggressive program.

Residents and businesses in the City of Port Townsend are required to subscribe to garbage collection and can continue to be reached through utility bill messages. Bill inserts have been found to be an effective method of reaching a variety of customers, although this approach would not be effective for apartment renters, for businesses who are sharing a waste container with other businesses, or for renters in single-family homes if they do not receive the garbage bill.

Residents and businesses in other areas of Jefferson County could also be kept informed through bill inserts. Many County residents do not subscribe to garbage collection, however, and instead choose to self-haul their waste to the Transfer Station or the Quilcene Drop Box. This group could be reached through materials posted and distributed at the waste disposal sites. Information kiosks at each of the drop box locations could be used to share educational messages and inform users of changes to recycling protocols.

To be effective, school education programs require some ongoing coordination between the schools and district offices, other public agencies, the general public, and the Solid Waste Education Coordinator.

The cost effectiveness of education programs is difficult to measure and evaluate. Indirect evaluation can be achieved through observations of waste volumes and the amount of waste that is diverted. Performance-based evaluations can be conducted based on the numbers of students, businesses, and service groups that receive information. Another measure of success could be to track the numbers of requests for information received by the Recycle Center, the Solid Waste Education Coordinator, City Hall/Utility Department, and others.

One of the special needs that can be addressed through public education is waste diversion programs in businesses. For the businesses, a two-pronged approach could be used, by informing them of the options for reducing and recycling wastes, and also motivating them to begin these activities. Approaches that have worked well in other areas for motivating the businesses are special awards or other recognition programs.

Illegal dumping is another problem that could be addressed through public education (see also Chapter 8 for more details about enforcement actions). In this case, public education could be used to discourage this behavior, by publicizing the bad aspects of this activity and also informing potential violators of the applicable fines and civil penalties.

In a discussion at the SWAC meeting in January 1999, top priority was given to public awareness education, school curricula and program implementation.

3.4.4 Recommendations for Public Education

The following recommendations are made for public education (see also Recommendations WR3, C2, C3, S1, S5, S12, and S14):

PE1) Public education will be given a very high priority. Public education must include activities such as;

- ➢ classroom presentations and other outreach through the schools (PE2).
- ➢ presentations and booths at special events and other locations (PE3).
- ➢ education for the County's Moderate Risk Waste Facility will be expanded, including the household hazardous waste and conditionally-exempt small quantity generator programs, information about materials that will not be accepted for disposal at the Solid Waste Transfer Station and Quilcene Drop Box, and giving waste prevention activities the highest priority (PE4).
- ➢ education and promotion for the City's Biosolids Compost Facility, on-site composting and worm bins will be expanded. The County and the Washington State University Cooperative Extension Service will cooperate to promote backyard composting (PE5).
- ➢ a public education component must be included in all waste reduction, recycling or composting programs, and public education must continue to be a primary element of program maintenance in the City and County. Education associated with recycling collection will be focused on improving and expanding participation as well as generating feedback and answering questions from the public. The responsibility for this lies primarily with the recycling contractor, the certificated haulers and the contract hauler (in the City of Port Townsend), who must inform their customers of the correct materials and preparation methods for recycling. Public education and other waste diversion programs that are included in City or County contracts must be fully implemented (PE6).

- the County will conduct outreach to inform citizens and businesses of the true costs of all components of the solid waste system, and any alternative funding options that may be considered by the County and City (PE7).
- the County, through a cooperative effort by Public Health and the Department of Public Works, will expand education and enforcement addressing illegal dumping (PE8, see also Recommendations RA4 and S1).
- the County, with assistance from the SWAC, will conduct a recognition program for businesses that reduce and/or recycle a significant portion of their wastes, basing this program on existing models from other communities (PE9).
- sustainability concepts will be included in public education materials developed by the County (PE10).
- the initiatives addressed by the state's Beyond Waste plan will be given a high priority (PE11).

PE12) Public information and education programs will be implemented and expanded through a joint Health/Public Works agreement, and in cooperation with the City, haulers and recycling companies.

PE13) A review will be conducted periodically of the public education program and other components of the solid waste system to evaluate the need to update or revise terms used so as to provide more meaningful communication.

3.4.5 Implementation Schedules and Costs for Public Education

The recommendations for public education are generally for existing activities that will be continued on an ongoing basis. Most of the activities will be conducted by the Public Health Department's Waste Prevention Education Coordinator, and are included in the budget for that position ($55,000 per year for salary and expenses in 2007 and 2008).

The education and enforcement activities for illegal dumping and other education programs are an ongoing activity and expense.

Recommendation PE1 has been given a very high priority for implementation, and so the specific activities recommended for public education are also considered to have a high priority (see also Table E.1). For PE3 (booths and other activities at special events), it should be recognized that the priority of any specific event is contingent upon the nature of the event, the degree to which participants are county residents or not, and possibly other factors.

Recommendation PE12 is also a high priority. Implementing this recommendation will require that steps be taken to ensure that the education goals and program design methods of the Public Health and Public Works are the same. The two departments will continue to develop annual work plans and timetables for project implementation and conduct regularly scheduled meetings for program analysis and outcome evaluations. This will include evaluating and using the best program-specific design methods. Specific methods will be employed where possible for data tracking and analysis of program efficacy, and those methods will help ensure that multi-agency projects utilize the same data tracking and analytical tools. Whole-system analysis methods such as "Ecological Footprints" and "Environmental Accounting" will be used where possible.

Recommendation PE13 has been given a low priority, in part because it will be conducted on an as-needed basis (presumably triggered by a perception of a problem or difficulty in communications), but not more frequently than once every two years.

For all public education activities, public awareness of solid waste and waste prevention programs will be encouraged through networking and idea sharing forums. Partnerships with grassroots organizations will be considered where goals and missions are compatible. Participatory design methods will be employed whenever possible.

CHAPTER 4: RECYCLING

4.1 INTRODUCTION

The solid waste management activities discussed in this chapter are organized into two sections based on the method of collecting and processing the recyclable materials:

4.2 Source-Separation Recycling Programs
4.3 Mixed Waste Processing Options

Section 4.2 discusses recycling programs that are based on the separate collection of recyclable materials (i.e., separate from garbage), which is the method currently used in Jefferson County. Section 4.3 discusses alternative recycling programs that are based on processing garbage to remove the recyclable materials after collection.

4.2 SOURCE-SEPARATION RECYCLING PROGRAMS

4.2.1 Existing Conditions for Source-Separated Recycling

Recycling Methods

Overview: Currently, there is only one buy-back center in Jefferson County and only one recycling processing center, both located at the Jefferson County Waste Management Facility (JCWMF) near the City of Port Townsend. Recyclable materials are accepted at the JCWMF and at the Quilcene Drop Box Site, both of which are staffed during open hours. There is a network of unstaffed recycling drop-off containers around the County. Used oil and antifreeze are accepted at several locations in the City and County, including the JCWMF and Quilcene site. Curbside recycling is available in the City of Port Townsend and in most of the unincorporated areas of the County. Commercial recycling services are available for most of the businesses in east Jefferson County.

Drop-Off and Buy-Back Programs: Unstaffed recycling containers are located in most of the larger communities throughout the County, and are on public or private property depending on the community. The exact locations of these containers may be changed on short notice, which has happened on several occasions recently for containers on private property and is usually due to litter problems. In addition, some of the locations have only one or two containers for specific types of material (such as mixed paper or mixed paper and cardboard) while others are designed to be more of a "full-service" drop-off site.

Recycling containers available to the public are maintained primarily by the County's recycling contractor. Most of the containers maintained by the recycling contractor are owned by the County. Other containers provided by the City's solid waste contractor or the certificated haulers to businesses and other agencies are generally not available to the public.

Curbside Programs: The City of Port Townsend has had curbside recycling since 1993. In the unincorporated part of the County, residents and businesses have the option of subscribing to recycling services provided by one of the certificated haulers, whether they are garbage collection customers or not.

Curbside recycling service in the City of Port Townsend is provided through the contract for garbage collection services. The curbside program uses three bins for collection and materials are collected every other week. The curbside program in the city is "mandatory" in that all customers pay for it through their garbage collection rates, whether or not they use the service. In the City of Port Townsend, there was an average of 48.2 tons per month collected for the curbside recycling program.

Multi-Family Recycling: Recycling services to multi-family units (apartments) are generally provided only in Port Townsend, where the contract hauler is required to provide such services upon request. Several apartment buildings currently participate in the recycling program.

Commercial Recycling Programs: Commercial recycling services in Jefferson County are provided by the recycling contractor, the City's solid waste contractor, one of the certificated hauler and other recycling service companies, often for a fee. The recycling contractor has operated limited collection routes for office paper and cardboard, and also provides a document shredding/recycling service.

Other materials recycled in Jefferson County by private companies, either as a special service or through drop-off centers in and near the County, include metals and grease.

School Programs: Most of the schools in the County have recycling program, using bags or other containers for collecting materials in the classrooms and offices. Students, teachers and maintenance staff empty these into central containers. This system is used by the Brinnon, Quilcene, Grant Street, Chimacum, and Port Townsend Schools. One school (Mountain View) has "super recyclers" that score the classes each week for their recycling performance and the winning class is rewarded with a party.

Other Programs: Last but not least, litter cleanup crews and other special cleanup events also endeavor to recycle a portion of the materials they pick up.

Processing: Materials collected through the recycling containers and curbside/commercial collections are primarily brought to the Jefferson County Recycle Center for processing and marketing. The Recycle Center is located at the Jefferson County Waste Management Facility near the City of Port Townsend, and this also serves as a recycling drop-off site for a wide variety of materials. Materials currently handled by the Recycle Center (as of mid-2006) include aluminum cans and clean foil, corrugated cardboard, glass bottles (brown, green and clear bottles and containers), newspaper, mixed paper, office paper, plastic bottles (PET and HDPE bottles), and tin cans. The Recycle Center also acts as a buy-back center for aluminum cans, copper and brass, and accepts electronics for a fee. Additional materials handled by County personnel at the landfill include waste oil, antifreeze, white goods and other ferrous metals. Murrey's Olympic Disposal transports the recyclable materials they collect to the Recycle Center for processing. The City's contractor (DM Disposal) is required by contract to transport all recyclable materials collected in the City to the Recycle Center.

Urban-Rural Designation

State planning guidelines recognize the differences in services that can be offered to urban versus rural areas for solid waste services. These differences are based primarily on the ability to conduct cost-effective collections and other services for garbage and recyclable materials. For instance, it is more feasible to conduct cost-effective collections for garbage and for curbside recycling in

urban areas than in rural areas because of reduced travel times between stops. A similar situation exists for commercial services, although in some cases business types and densities do not correlate well to urban population centers, and so a simple comparison of urban versus rural areas can be misleading for evaluating the need for commercial services.

The Jefferson County Comprehensive Plan (JC 2004) will be used as the official determination of the areas designated as urban in Jefferson County. That document not only addresses other factors relevant to urban service levels and is periodically updated, but it is the official document for designating urban areas. The Jefferson County Comprehensive Plan currently designates three areas as non-rural: the City of Port Townsend, the Irondale/Hadlock Urban Growth Area (UGA), and the Port Ludlow Mater Planned Resort (MPR). Ecology's planning guidelines recommend that these areas should receive curbside recycling services (which they currently do), while other areas of the County can be adequately served with drop-off centers at convenient locations. Other urban service areas may be created at a later date if the County approves additional urban growth areas, and for consistency any new UGAs should also be designated as urban areas for solid waste services.

Market Analysis

State regulations (RCW 70.95.090.7.c) require "a description of markets for recyclables." State planning guidelines also require designation of what materials will be collected for recycling, with marketability being one of the factors to consider in this designation process. The designation of recyclable materials has taken on more importance with the recent adoption of Ch. 173-350 WAC, which defines recyclable materials as being those materials "that are identified as recyclable materials pursuant to a local comprehensive solid waste plan."

A description of markets for materials collected in Jefferson County is provided below. This is intended to be only a brief report of current conditions (current as of mid-2006), and it should be noted that market conditions for recyclables can change drastically in a short amount of time. This is a problem for a long-range document such as this plan. Rather than provide an exhaustive review of current market conditions, this plan will be more useful in the future if it can be responsive to changing conditions. Hence, the list of designated materials includes a description of the process for revising that list.

Market Overview: A significant factor for current market conditions is the demand by Chinese buyers for many recyclable materials, especially paper, plastics, and steel. China has become a very significant force in the marketplace because they are currently improving their infrastructure and also experiencing higher demand due to increased production of consumer goods for internal consumption and for export to the United States and other countries. Because of their higher demand, they are apparently willing to accept lower grades of paper and plastics, although this may change due to recent regulations implemented by the Chinese government that will prohibit the importation of loads that are excessively contaminated with garbage.

Another important factor for marketing of locally-collected materials is the transportation costs incurred in shipping materials to end-markets or to ports. Recyclers on the Olympic Peninsula have less access to these markets because the transportation cost is a barrier. The low market value of most recyclables limits the number of materials that can be cost-effectively moved to markets and forces the region to develop creative programs and/or focus their efforts on larger portions of the waste stream.

Paper markets: Recyclable paper products such as newsprint, corrugated containers and high-grade paper make up approximately 12.1% of Jefferson County's disposed waste stream. Local drop-off centers currently accept most of these categories of paper. These items are typically recycled because residents can routinely identify these materials as recyclable. Paper densities also allow for efficient collection programs. One difficulty associated with collecting paper is the potential for non-recyclable and lower grades of paper to get mixed in with higher grades of paper, which then decreases the market value of the material. On the other hand, some markets allow mixing of paper grades depending on the processing methods and end markets. All of the paper grades are receiving relatively high market prices currently.

Mixed waste paper is a mix of a variety of grades of paper, and is used to manufacture low-grade paper products. The market price for mixed paper is generally lower than other grades of paper because processing costs are higher and the value of the end product is lower. Much of the mixed waste paper collected in Washington is currently exported to Asian markets. Locally, cardboard is sold to the Port Townsend Paper Corporation, newspaper is sold to the Nippon paper mill in Port Angeles, and other paper is sold to Weyerhaeuser (in Kent). Most recycling sites in Jefferson County collect mixed paper.

Glass recycling markets: Recyclable glass represents approximately 3.2% of the county's total waste stream. Glass is relatively easy to identify and separate, so most recycling programs collect glass. Handling and transportation costs are relatively expensive, however, and the raw materials that compete with glass (sand and other common materials) are relatively inexpensive, and so the market conditions for glass are generally poor. The markets for clear glass are better than for colored glass because there is more demand for clear bottles in this region. Several products shipped into Washington are contained in green or brown bottles, whereas local bottlers do not use much of the colored glass, and so there is generally a surplus of the colored glass bottles. The amount of additives required to turn glass from clear to brown or green is very small, and so there are strict requirements for keeping these materials separate from clear glass and from each other.

Developing local uses for glass are often the best strategy, to the extent that this is possible, and a good example of this is provided by the city of Cashmere, which uses crushed glass (mixed clear and colored) as bedding material in their utility trenches. The city also makes it available for contractors to use. Other alternatives include using glass as a filter medium in water processing operations, as a fill material for roads or for use in sandblasting.

Metal recycling markets: Metals in the waste stream include aluminum and tin cans, ferrous and non-ferrous metals, and "white goods" (large appliances). Metals represent approximately 7.2% of the total waste stream in Jefferson County, and almost all metals have some market value. In fact, most of the grades of metal have significant market value, especially aluminum cans and other non-ferrous metals.

Aluminum cans are relatively easy to handle due to easy identification by generators, and prices for aluminum cans have historically been higher than most other recyclables. Shipping used aluminum beverage cans usually required compacting the cans into bales or size reduction by shredding. Much of the aluminum collected by recycling programs is used by the aluminum industry.

Ferrous metals contain iron, but tin-plated ferrous cans ("tin cans") usually must be kept separate from other ferrous metals for recycling. Tin cans are made of steel covered by a

thin layer of tin to protect the container from corrosion. In order to be recycled, the cans must go through a de-tinning process, which results in steel that can be used in a manufacturing process. Once removed, the tin plating on ferrous cans typically receives a higher price per ton than ferrous metals.

Plastics recycling markets: Plastics in the waste stream include PET and HDPE bottles, film and bags, expanded polystyrene ("Styrofoam"), and other plastics. Plastics are commonly used for packaging, but a lot of plastics are also used to make a variety of products, from toys to building materials. Approximately 12.9% of Jefferson County's total waste stream is plastic.

Wood and yard debris markets: Markets for wood and yard debris are discussed more thoroughly in the next chapter, but are briefly mentioned here because of the need to consider these for the list of designated recyclable materials. While currently there is no shortage of yard debris and wood wastes, there is also a strong demand for the compost and mulch that can be made from it.

Food waste markets: If food waste could be effectively collected and composted, it could easily be absorbed by agricultural lands and landscaping applications. The difficulty and expense of collecting food waste from residential sources may prevent this material from being added to the list of designated materials, but the next chapter will discuss the possibility of similar materials being collected from commercial and industrial sources.

Other recycling markets: Other materials collected for recycling in Jefferson County include computers, fluorescent light bulbs, textiles, car batteries, motor oil, and tires. Markets for these materials are generally good, although not so good in many cases that collection services can be provided without charge. Even where services are provided for a charge, however, for all but textiles there is another compelling reason (toxicity) for keeping these materials separate from the waste stream.

Designated Recyclable Materials: As mentioned above, state laws and Ecology guidelines require that the counties develop and adopt a list of recyclable materials that are designated as the materials to be commonly recycled in the county. In this case, the list is not intended to create the requirement that every recycling program in Jefferson County collect every designated material. Instead, the intent is that through a combination of programs offered throughout the county, residents and businesses should have an opportunity to recycle all of the designated materials through at least one program. In other words, if plastics are on the designated materials list, then at least one program in the county must collect plastics.

The criteria for designating recyclable materials includes:

- potential waste stream diversion.
- collection efficiency and feasibility.
- processing requirements (including costs).
- market conditions.

Table 4.1 shows an evaluation of the recyclability of various materials according to these four criteria (diversion potential, collection efficiency, processing requirements and market factors). The main factor considered for evaluating a material's potential for waste stream diversion is the

Table 4.1. Evaluation of Recyclable Materials.

Recyclable Material	Diversion Potential	Collection Efficiency	Processing Requirements	Market Factors
Paper:				
Cardboard *	High	High	Low	High
Newspaper *	Medium	High	Low	High
High-grade paper *	Medium	High	Low	High
Magazines/catalogs *	Low	High	Low	High
Mixed waste paper *	High	High	Medium	High
Glass:				
Clear glass bottles *	Medium	Medium	Low	Medium
Brown glass bottles *	Low	Low	Low	Low
Green glass bottles *	Low	Low	Low	Low
Metals:				
Aluminum cans *	Low	High	Low	High
Tin cans	Medium	High	Medium	High
Electronics	Low	Low	High	Low
White goods	Low	Medium	High	Medium
Ferrous metals *	High	Medium	Medium	High
Non-ferrous metals *	Low	Medium	Medium	High
Plastics:				
PET bottles *	Medium	Medium	Low	High
HDPE bottles *	Medium	Medium	Low	High
Other bottles (3-7)	Very low	Low	Medium	Low
Styrofoam	Low	Low	Medium	Low
Plastic film, bags	High	Low	High	Low
Other plastic pkg.	Medium	Low	Medium	Low
Organics:				
Yard debris *	High	High	High	High
Wood waste	Very high	High	High	Medium
Food waste	Very high	Low	High	Low
Other:				
Construction debris	High	Medium	High	Low
Motor oil *	Low	High	Low	High
Tires	Low	High	Low	Low

The rating system for the above criteria is:

Diversion potential; high = more than 3% remaining in the waste stream, medium – 1-3%, and low = less than 1%, based on waste composition from Clallam County (see Table 2.5).

Collection efficiency; the rating is a relative assessment of the ease of preparation and handling.

Processing requirements; the rating is a relative assessment of the ease of processing the material (note: this approach assumes some degree of separation by the waste generator, not single stream or mixed waste processing. For single stream systems and mixed waste processing, all processing = high and market factors are generally diminished by one grade).

Market factors; the rating system shows high for high-value materials, low for materials hard to transport to market.

* Shown on the list of designated recyclable materials (see Table 4.2).

percent (by weight) of the material in Jefferson County's total waste stream. The primary consideration used to evaluate the collection efficiency of a source-separated recyclable material is a relative assessment of how easily the material can be handled, both in preparation and collection/loading. Processing requirements were evaluated by assessing the relative degree of difficulty and the reliability of the technology used to prepare the material for market. The assessment of market factors is based on the preceding discussion of markets. Note that the evaluations shown in Table 4.1 assume a traditional source separation approach, and would be different for single stream recycling or mixed waste processing.

Based on the evaluation shown in Table 4.1 and information presented in other parts of this Plan, the proposed list of designated recyclable materials are shown in Table 4.2. This list of designated recyclables will be used to help guide program development and implementation. As mentioned above, however, the list of designated materials is not intended be universally mandatory. Residents and businesses in Jefferson County should have the opportunity to recycle these items through at least one program of facility in the county.

Table 4.2. List of Designated Recyclable Materials.

Material	Amount in the Waste Stream[1]
Newspaper	400 TPY[2]
Cardboard	802
Office paper/ other high-grade paper	1,314
Magazines/catalogs and phone books	
Mixed waste paper	
Glass	688
Aluminum cans and foil	220
Tin cans	338
Ferrous/non-ferrous scrap, white goods	966
PET and HDPE bottles	468
Yard debris and brush	646
Used motor oil	2
Antifreeze	NA[3]

Notes: 1. "Amount in the waste stream" is from Table 2.5, based on 2005 quantities.
2. TPY = tons per year. All figures shown are in tons per year.
3. NA = data not available.

Process for revising the list of designated recyclables: The list of designated recyclable materials should be evaluated periodically to consider adding or subtracting specific materials. The list is based on existing conditions (collection programs and markets), and future markets and technologies may warrant changes in this list. There could be many possible reasons for revising the list, including but not limited to:

- the market price for an existing material becomes so low that it is no longer feasible to collect, process and/or ship it to markets, or no market can be found for an existing recyclable material, causing the material to be stockpiled with no apparent solution in the near future.

- new local or regional processing or demand for an existing material occurs.
- local markets and/or brokers expand their list of acceptable items based on new uses for additional materials or technologies that increase demand for a new material.
- the potential for increased or decreased amounts of diversion.
- other conditions not anticipated at this time.

Any proposed changes in the list of designated materials must be submitted to the SWAC for their discussion and approval. The SWAC membership may at any designated meeting recommend changes to the designated recyclables list and then forward the recommended changes to the Public Works staff for their consideration. In addition, the list of designated materials should be reviewed at least annually by the SWAC. If Public Works staff concur with a proposed change, the SWAC should discuss it during a regular meeting, and then the committee can vote on whether to adopt the change or not. Only until the SWAC has voted with a quorum of members, as stated in the by-laws, can the list be officially changed. A change in the list of designated materials does not require an amendment to the Plan.

According to the most recent Ecology recycling survey, Jefferson County recycled 21,745 tons of material in 2005. An additional 4,645 tons of other materials were diverted (for those materials and activities that are not officially defined as "recycling"). The amount of solid waste disposed in that year was 20,800 tons. Based on these numbers, the total recycling rate (including composting) for Jefferson County was 46.1%. With the additional tonnage provided by diverted materials, the waste diversion rate was 55.9% (see Table 2.6 for more details).

4.2.2 Needs and Opportunities for Source-Separated Recycling

State planning guidelines (70.95.0907c) require that recycling services be provided through curbside services in urban areas and drop-off sites in rural areas. The primary criteria recommended for drop-off sites is that there be one such center at a convenient location for every 5,000 to 10,000 residents. Existing programs in Jefferson County currently satisfy these recommendations (see also Sections 2.3.1 and 4.2.1 for more information about urban and rural service levels).

Drop-of sites are, however, hard to maintain due to litter and illegal dumping problems. Attempts to address these problems through education and surveillance are partially successful, but in the long term these problems have led to the removal of many drop-off sites, especially those on private property, in Jefferson County and other areas.

Other requirements shown in the State's planning guidelines or other documents include:

- the list of materials collected for recycling must be consistent with the recommendations of this plan.
- this plan must be consistent with other local plans and goals, such as the County's and City's comprehensive land use plans.
- waste diversion potential (waste reduction, recycling and composting) should be maximized based on local conditions and markets.

In general, recycling in Jefferson County depends on the efforts of private companies or non-profit organizations under contract to the County. Market revenues from the sale of collected materials have not, historically, covered the costs of operation (collection and processing). Recent increases in market revenues have not offset increased costs (especially higher transportation costs) and are not expected to increase in the near future to the point where the operating costs will be covered. While recycling provides other benefits, including avoided disposal costs, reduced greenhouse gas emissions and reduced consumption of resources, the ability to capture and apply these benefits and their costs to local recycling programs is lacking. Thus, recycling sales revenues must be supplemented using funds from other sources, such as revenues acquired through the solid waste disposal fees. In the long run, relying on disposal fees for funding recycling programs could be a problem if recycling and waste reduction continue to reduce the amount of waste being disposed. On the other hand, this approach increases the cost of waste disposal, which provides additional incentives for people to use less-expensive recycling and waste reduction options.

Currently much of the work related to processing and marketing of recycled materials, and a significant portion of the collection effort in the County and City, is carried out by a recycling contractor. The recycling contractor is presently a local company whose mission is to provide education, training and employment for developmentally disabled and "at-risk" community members. The County supports this program solely from a portion of tipping fees, in lieu of any excise tax monies. The Recycle Center building was partially funded by the State Department of Social and Health Services for the training of developmentally disabled individuals, and has conditions attached to ensure its continued use in this capacity.

The Recycle Center building and operation is approaching maximum capacity, and is perhaps exceeding an ideal capacity at times in the summer (when material flows are the greatest). The recycling contractor has been examining options for addressing capacity shortfalls, by transferring mixed recyclables out of the county and taking other steps, but more will need to be done if the growth in recycling tonnages continues.

In general, schools outside city limits need support for collection containers. Some schools have requested county staff hours to remove unwanted publications from mailing lists, find homes for unwanted materials such as empty plant pots and pallets, locate reuse materials for projects, to promote recycling and waste prevention during lunch periods, and communicate with haulers to minimize the expense of garbage disposal services.

One distinct barrier to increased recycling activities is the rural nature of most of the County. The County's population is not only widely distributed, but the west end of the County is separated from the majority of the population by the Olympic Mountains.

Long-term market stability may be a problem for some materials. Prices for most materials can be expected to fluctuate due to competition with raw materials and other economic factors. The quantity and quality of recycled material also influences the markets available and the price received.

Local markets for recyclable materials may provide better and potentially more stable outlets for collected materials, while improving the local economy as well.

Currently, neither the County nor the City has established official procurement policies for office paper and other materials. Competitively-priced recycled paper can be found on the market today, but the lack of a standard procurement policy leaves the burden up to the individual office manager to research price options.

The long-term plans for recycling and other services should take into account the idea that nearly 40 percent of the county's residents will be 65 and older by 2025 (see Section 2.2.2 for more details). Current and long-term plans for recycling and other services should also address the fact that about 12 percent of the residents are seasonal.

Current information on the composition of the waste stream (a measure of the potential for additional recycling) is available only through data borrowed from other areas. More accurate assessments of the performance of current recycling and waste reduction programs would be possible if local data were collected on the amount of disposed materials.

4.2.3 Alternative Methods for Source-Separated Recycling

The west area of the County could be served through a regional approach with Clallam County to the north or Grays Harbor County to the south. The transfer station near Forks (in Clallam County) currently provides alternative recycling and disposal options for west Jefferson County residents (in addition to the recycling containers at the Clearwater Annex).

Additional financing for recycling could come from an increase in the tipping fee paid at the Transfer Station. This approach may not be practical, however, since the current tipping fee is already among the highest in the region at $110 per ton. The supplemental cost for recycling is currently built into that fee, but not as a dedicated fee, hence these funds are not guaranteed. A separate charge for recycling (based on weight or volume) might be more secure and could be adjusted as needed, depending upon the markets. This may, however, act as a deterrent to recycling and source separation unless the charge for recycling is substantially less than the solid waste fee.

Another alternative for funding could be taxes levied by a special district, such as a disposal district as provided by RCW 36.58. If a disposal district is created in the County, charges for solid waste handling and disposal could be collected separately through the tipping fee or as part of any district taxes. Other program costs (landfill closure and monitoring, recycling, MRW Facility, etc.) could also be collected as dedicated funds through district taxes (see Chapter 8 for more details about districts).

The County, through its agreements with haulers and with the education program, could make education of the commercial sector a higher priority. The Waste Prevention Education Coordinator is available to businesses outside the City for audits and consultation, although only as time permits.

The financial losses from recycling glass could potentially be resolved in several ways, the most promising being the possibility of local applications such as a partnership with a gravel, concrete or asphalt company to have glass bottles crushed and mixed with one or more of their products. This may require a capital outlay to provide a glass crusher specifically for this operation. Savings would be realized from not having to separate by color and then ship to markets in the Seattle/Tacoma area.

One option for any recycling program is to make it mandatory for residents and/or businesses to participate in it. The term mandatory is also sometimes used to refer to payment of the costs for a recycling program. Some people view the Port Townsend curbside program as mandatory because all the residents and businesses pay for recycling collection services through the garbage collection rates, but participation in the recycling program is voluntary. Mandatory payment for curbside

recycling collection services works well in the City of Port Townsend but is not an attractive alternative to County residents (as evidenced in the surveys and workshops conducted in 1997 and 2006) where it would currently appear as an explicit additional cost to garbage collection customers. The use of incentive rates (or what is sometimes called the "mandatory pay/voluntary participation approach," see also Section 6.2.3) would, however, allow the cost of recycling services to be embedded in the garbage rates for the rest of the county (i.e., in a fashion similar to Port Townsend's system). Other mandatory approaches include banning specific materials from the disposal system or ordinances requiring source separation of specific materials by homes and/or businesses.

Enforcement of mandatory participation programs can be difficult. Garbage haulers and disposal facility operators are typically forced into the position of enforcing the program by noting when trash cans or waste loads contain recyclable materials. Often only a warning is issued for the first violation, and then fines or extra fees may be levied for continued violations.

Voluntary recycling programs require effort to maintain high participation rates. The keys to a successful voluntary recycling program are convenience and public education. Increasing people's knowledge of recycling methods and making sure they know how and where to take recyclables can help keep the participation rate high. Promotion of recycling must be consistent and ongoing. These responsibilities are currently shared by the recycling contractor, the County's Solid Waste Education Coordinator, and the certificated hauler.

If the County desires to increase the availability of rural recycling services, there would be several options for achieving this. Jefferson County could:

- contract with a private company to provide residential recycling services.
- mandate specific services by an ordinance.
- provide additional drop-off containers through contracts and/or other financial support.

Counties have the authority to contract for residential recycling services under current State law (RCW 36.58.040). This authority does not extend to commercial recycling services or to garbage collection services for either residential or commercial customers (in the absence of a collection district, see discussion in Chapter 8). Other companies cannot be prevented from also offering recycling services. The advantage of exercising County authority is that the County would be in control of the system. The County could choose contractors and adjust the program as it develops to best meet the County's goals. If the County contracts for recycling services, however, the County will bear administrative costs. It may be necessary to assess additional surcharges on the tipping fee or on solid waste collection services to fund parts of the recycling program.

A service ordinance could achieve some of the same ends as a County contract but without the ongoing administrative costs.

Additional recycling containers for materials such as newspapers, glass bottles, cans and plastic bottles would provide a higher level of service and increased recycling tonnages, but recently the trend has been to remove these containers because of the large amounts of litter and non-recyclable trash attracted by them. Several recycling containers have had to be removed due to these problems, either at the request of property owners or because the recycling organization was incurring excessive cleanup costs for trash dumped in or next to the recycling container. Finding new locations for the containers is a challenge due to these problems, but ideally, additional locations could be found and these should be convenient and in areas with high traffic and

visibility. This would encourage participation while discouraging vandalism and trash disposal. Other alternatives include staffing the containers during open hours, tax relief or other incentives for the host facilities, hiring people or using the litter crews to keep the area around the containers clean, and placing containers at public facilities. Using public property for permanent drop-off sites may be one of the better strategies for long-term stability. Placing bins in a three-sided structure, although more costly, may reduce noise and litter problems. Containers that are intermediate in size between the standard 96-gallon bins and the full-size drop boxes could also open up new possibilities in neighborhoods and at businesses.

Additional assistance to the schools, and other institutions and businesses, can be provided on as-needed basis, as appropriate and as time allows, by the Public Health and Solid Waste staff. For sustainable programs that have long-term stability, however, the schools and other waste generators will need to take the primary responsibility for their own recycling and other waste-related programs. On the other hand, the schools and other locations could also allow the public to use recycling containers at their locations as a public service or even a fund-raising effort (if the material collected is a high-value material such as aluminum cans).

A Recycling Potential Assessment (RPA) could be conducted to more accurately assess the potential for additional recycling in Jefferson County. This could be approached several ways:

- a waste composition study could be conducted. This approach generally provides detailed information on the four to five major sources of waste (residential, commercial/institutional, residential self-haul, and non-residential self-haul) and is conducted over two or four seasons. The cost for this type of study is $40,000 to $60,000.
- an RPA could focus on specific types of waste, such as commercial or self-haul, and could use weighing studies or visual observations to identify key recyclable materials and the primary sources. The cost for this approach would depend on the scope of the effort and whether visual or weighing methods were used, but generally the cost for this approach is half or less of the cost for a waste composition study.
- a "paper study" could be conducted, using data borrowed from other areas but applying this data in more specific and precise ways than what was done in Chapter 2 of this plan (see Table 2.5). This would be least expensive approach but it would probably not be beneficial in the case of Jefferson County, since it is unlikely that better data than what has already been used would be available (in other words, the Clallam County data shown in Chapter 2 is probably already the best possible match for borrowed data).

4.2.4 Recommendations for Source-Separated Recycling

The following recommendations are made for the recycling programs in Jefferson County (see also Recommendations WR4, PE6 and WC1):

R1) The County will continue to strive to meet a 50% goal for waste reduction, recycling, composting and waste diversion.

R2) In order to meet the goal of improved recycling economics, existing recycling programs will be examined to increase their cost-effectiveness. Expanded recycling programs may require additional financial support. The SWAC will continue with its proactive role in addressing these issues. The County and City will continue to explore all funding and contract options for the recycling program.

R3) Public recycling containers should be available throughout the County. Options for locating these on County/City or other public property will be pursued, and incentives for encouraging private businesses to host recycling containers will be examined.

R4) The County and City will encourage market development for designated and potentially recyclable materials. Participation by the business community and economic development agencies will be encouraged in this effort, and a priority should be put on finding feasible local alternatives for problem materials (such as the potential use of glass as aggregate).

R5) The County and City will continue to support and encourage private efforts to divert recyclable materials from non-residential sources.

R6) A Recycling Potential Assessment (RPA) will be conducted in Jefferson County, contingent on grant funds being available for this.

4.2.5 Implementation Schedules and Costs for Source-Separated Recycling

The recommendations made above are primarily for ongoing activities and additional exploration of potential activities. As such, funding for these activities has already been included in the County's budget (with the support of CPG funds from Ecology). Many of the activities will be conducted by existing staff, and in addition the County already owns, and has budgeted funds for the maintenance of, several recycling containers. Any additional expenses for market development efforts are uncertain at this time (until various details are further developed), but could include expenditures for equipment, pilot projects and additional staffing. This recommendation should be conducted on an ongoing basis.

Recommendation R1 has a very high priority for implementation, so high that it is considered to be a "guiding principle" for Jefferson County's solid waste system. Recommendation R3 has been given a high priority for implementation, Recommendations R2, R4 and R5 have medium priority, and Recommendation R6 has a low priority (see also Tables E.1 through E.3).

4.3 MIXED WASTE PROCESSING OPTIONS

4.3.1 Existing Conditions for Mixed Waste Processing

Mixed waste processing systems range in complexity from simple "dump-and-pick" operations to highly mechanized facilities.

With dump-and-pick operations, recovery is typically limited to larger items that are easily removed (such as cardboard boxes and scrap metal). In this case, the primary requirement is simply that the disposal facility must have a sufficiently large tipping floor to allow loads of waste to be dumped out of collection vehicles onto a flat surface, ideally with enough space to spread out each load and/or to allow access to all sides of it. A forklift or other equipment is also necessary for moving and emptying the containers used for temporary storage. Other requirements include additional labor to pull out materials plus containers for both temporary and long-term storage of the recovered materials. Dump-and-pick operations create a situation where workers have extensive contact with raw garbage, with the subsequent risks to their health unless the proper precautions are taken.

The County, SWAC and recycling contractor have all expressed interest in implementing a dump-and-pick operation at the Transfer Station. This operation would target recyclable materials that could be diverted from the waste stream prior to the loading of the trailers. Previous discussions have also included the possibility of recovering reusable items, such as furniture, appliances, bicycles and toys, tools, and lumber scraps. Transfer Station personnel or others could recover these items for giveaway or resale. No salvaging by the public would be allowed. Currently, the only materials that are recovered in this manner are ferrous metals.

4.3.2 Needs and Opportunities for Mixed Waste Processing

A mixed processing system could recover additional amounts of recyclable and reusable materials. Data from waste composition studies in other areas indicates that between one-third and one-half of the waste stream is made up of recyclable materials. Data from a waste composition study conducted for Snohomish County (GS 1998) shows that the waste stream for that county contains 3.7% (by weight) of reusable materials (materials that could be directly used for their original purpose). The major components of the reusable materials found in Snohomish County included wood building materials (20.6% of the total), large pieces of carpet (16.2%), new asphalt shingles (11.7%), and various metal objects (11.0%), with the remainder made up of furniture, special wastes, plastic products, soil, clothing, and miscellaneous other materials.

A mixed waste system that processes solid waste using a mechanized system would require significant capital investment Examples of mechanized systems include solid waste composting (see Section 5.4) that includes recovery of recyclable materials, and systems that use conveyor belts and other equipment such as magnets to recover recyclables (such as is being done in Island and Thurston Counties).

4.3.3 Alternative Methods for Mixed Waste Processing

Dump-and-Pick Operation

Pursing the idea of a dump-and-pick operation would require a careful examination of the operational issues for the various options, as well as examining the overall feasibility (particularly on a cost-benefit basis).

Operational issues for a dump-and-pick operation include:

- Staffing: More workers would be required on-site at the Transfer Station, and these could be County staff or private employees.
- Location: A central location for picking operations would be required. If a "resale area" were to be considered a part of the operation, it would need to be well separated from the tipping floor of the Transfer Station for safety reasons.
- Proceeds: Materials removed from the waste stream could be given away or sold. Monies collected through this program could be used to offset recycling program costs and to promote the resale program. Another option would be to contract the reuse operation to a private entity, and allow that entity to keep any net profits.
- Markets: The success of the area's many thrift stores demonstrates the interest in reuse by the citizens of Jefferson County.

- Liability: Issues of liability and associated costs may make it difficult to establish a dump-and-pick operation at the Transfer Station. The County and City's legal counsels should consider this issue.

Mixed Waste Processing

Mixed waste processing requires a facility or system that is designed to accept garbage and process it to remove the recyclable materials. Processing typically includes a combination of mechanical systems, which are effective at removing only certain materials, and manual sorting. Mixed waste processing could be used in place of source separation, although often it is used in addition to traditional recycling programs to remove materials remaining in the waste stream. Mixed waste processing is also used with a co-collection program, where recyclables are placed in special bags that are then recovered at a central facility (see Section 6.2.3 for more information on co-collection methods).

In the case of highly mechanized facilities, a great deal of capital equipment (trommel screens, conveyors, air classifiers) and manual labor is used to remove a wider range and greater amount of recyclable materials. A typical facility might include a tipping floor for removing bulky and other non-processible materials, trommel screens (a rotating drum with one or more sizes of holes in the side) and/or air classifiers for the initial separation of waste components, a picking line for manually removing materials, and conveyors to link these elements together. The materials recovered from this type of facility may be lower in quality (dirtier) than source-separated recyclables, and the economics of this approach may hinge on the availability of a waste-to-energy plant to purchase the light residuals (non-recycled paper and plastic) as a fuel.

A study conducted for Port Angeles (Parametrix 1993) concluded that mixed waste processing was close to being economically competitive (at $93 to $95 per ton) with other solid waste handling options and could divert approximately 30% of the waste stream. This analysis assumed the remaining waste would be exported and that other recycling programs in Clallam County would be cancelled (existing recycling would be replaced by a central recovery facility, and the cost savings from the cancelled collections was included as an avoided cost). Since that study was developed, however, this type of facility has been proven to be a riskier venture than once thought (several similar facilities have failed) and waste export costs have proven to be significantly lower than projected. Furthermore, there would be lower economies of scale in Jefferson County than in Clallam County due to lower quantities of waste and recyclables, and so the cost per ton for capital-intensive approaches such as mixed waste processing would be higher. A regional approach (combining the waste streams of both Jefferson and Clallam Counties) would lead to lower processing costs, but transportation costs to ship both counties' wastes to a central location would likely exceed any processing cost savings.

In any case, waste processing can be a relatively expensive and risky approach for recovering recyclable materials, and so it is usually not pursued unless there is a strong mandate for increased recycling or very high disposal fees (i.e., a high potential for avoided costs). If part of the facility or equipment is already available, however, then mixed waste processing may be more feasible.

4.3.4 Recommendations for Mixed Waste Processing

The following recommendation is made for mixed waste processing activities in Jefferson County:

R7) The County will continue to evaluate the possibility of pulling recyclable and/or reusable materials from solid waste after it is dumped on the floor of the Transfer Station.

R8) Any proposal for a mixed waste processing or composting system must include conducting an RPA and a demonstration or pilot project.

4.3.5 Implementation Schedules and Costs for Mixed Waste Processing

Recommendation R7 has a low-priority and will need to be refined at a later date if implemented. If implemented, costs could include staff time for contracting and monitoring, additional staff (and whether those staff should be public or private/contract employees), capital improvements (modifications to the transfer station, construction of a storage facility, conveyor systems, and/or other alterations), equipment (small loader, forklift, and/or trucks for transporting materials), insurance, and other costs. Future implementation of dump-and-pick should explore options for potential partnerships with service organizations or other private parties. Future construction plans for the new Transfer Station should allow for dump-and-pick options if possible.

The success of a mixed waste processing system, solid waste composting system, or other alternative technologies that process mixed waste will depend significantly on the composition of the waste stream to be handled. Unless a waste composition study has already been recently conducted (see Recommendation R6), a recycling potential assessment (RPA) or waste composition study must be conducted prior to constructing a mixed waste processing, solid waste composting, or other waste processing system. In addition, given the history of problems with these technologies, a demonstration or pilot project must be successfully conducted prior to full-scale implementation. Note that Recommendation R8 applies only to mixed waste approaches, and not to source-separated food waste or recyclable materials. Recommendation R8 has been given a low priority only because it does not need to be conducted unless or until a mixed waste processing or composting system is proposed.

CHAPTER 5: COMPOSTING

5.1 INTRODUCTION

The solid waste management activities discussed in this chapter are organized into three sections based on the type of material to be composted:

5.3 Yard Debris Composting Programs
5.4 Food Waste Composting Options
5.5 Solid Waste Composting Options

Section 5.2 discusses current activities and potential options for composting yard debris. Sections 5.3 and 5.4 discuss the potential for new programs to divert food waste and compost mixed garbage, respectively.

5.2 YARD DEBRIS COMPOSTING PROGRAMS

5.2.1 Existing Conditions for Yard Debris Composting

Background

Composting can be defined as the controlled biological decomposition of organic materials to produce a beneficial product (compost). Compost has many applications, but as a soil amendment it provides organic matter and nutrients, loosens soils that are compacted or have a high clay content, and helps retain moisture.

In this Solid Waste Management Plan (SWMP), yard debris is defined to include lawn clippings, leaves, weeds, and tree prunings. Because prunings are included in the definition of yard debris, this chapter also addresses the chipping of brush and similar activities.

Waste Reduction Methods

Waste reduction methods that are currently in use include on-site grinding of land-clearing debris and the use of flail mowers that do not collect yard debris. These methods are currently being encouraged to avoid the surplus of yard debris being brought to the compost facility's drop-off site, but the drop-off site provides a relatively inexpensive option. A survey of tree service companies in 2006 found that most of them conduct on-site grinding or chipping.

Collection Methods

The certificated (franchise) haulers report that rural residents are currently disposing of only small amounts of yard debris. Many rural residents of the County use on-site composting ("backyard composting") or use the drop-off site at the Jefferson County Waste Management Facility for yard debris. Backyard composting is considered to be a waste reduction technique and is discussed in Chapter 3.

Collection services for yard debris include the City of Port Townsend's curbside collection program and the drop-off sites at the Jefferson County Waste Management Facility. In both cases, the yard debris is used as a "bulking agent" at the City of Port Townsend Biosolids Compost Facility. Drop-off of yard debris at the Waste Management Facility is available to commercial and residential customers at no charge. This material must be less than eight feet long and ten inches in diameter. The drop-off program began in the latter half of 1992, with incoming material being stockpiled until the first phase of the compost facility became operational in December 1993. The tonnages collected in recent years through the drop-off and curbside programs are shown in Table 5.1. A five-year average of the monthly amounts is shown in Figure 5.1, showing the seasonal variation in yard debris generation.

The City's yard debris collection program began January 1, 1998. The City's contract with Waste Connections requires that curbside collections of yard debris be conducted from April 1st through October 31st of each year, with every other week collections that alternate with the recycling collections. Although not required by their contract, in the late 1999 Waste Connections began voluntarily collecting yard debris year-round (12 months a year). Materials collected include leaves, grass clippings, and branches. Branches must be less than four inches in diameter, and in bundles that are less than four feet long, less than two feet in diameter and that weigh less than 40 pounds. Christmas trees are also collected in the first full week of January. The amount of material that has been collected through the curbside program is shown in Table 5.2.

Processing Systems

Port Townsend Biosolids Facility: As mentioned above, the yard debris collected in the County is brought to the City of Port Townsend Biosolids Compost Facility. This facility is located on County property at the Jefferson County Waste Management Facility, and is operated and maintained by the City. While the primary purpose of this facility could be viewed as a method to process the City's sewage sludge (biosolids) and also the region's septage, it serves as an excellent method to handle the yard debris. Yard debris is ground (in the case of woody materials) and mixed with the biosolids to serve as a "bulking agent". By itself, the biosolids would not compost well. The yard debris adds structure and absorbs some of the moisture present in the biosolids, thus allowing the mix to be formed into piles for composting and also adding porosity that improves aeration (the microorganisms that cause composting to occur require oxygen to operate most efficiently). More information on the design and operation of the Biosolids Compost Facility can be found in Section 9.5.

The end result of the composting process is a soil-like product that is tested and then sold to the general public and private contractors. Sales are conducted in bulk (i.e., by the truckload) at the Biosolids Compost Facility. Several batches of compost (typically three batches) are produced annually and the compost is sold fairly quickly during most of the year. There have been a few occasions when the amount of compost produced exceeded the seasonal demand for it, and alternative markets had to be found for it (such as a soil improvement project for a park or discounted sales to commercial customers). There is also currently an excess amount of yard debris being received, and some of this material has been distributed through alternative markets such as mulch.

The location and operation of the Compost Facility is based on a lease between the County and City. The County has leased the City a parcel of land at the Jefferson County Waste Management Facility for the Compost Facility. The land is part of the site for the closed County landfill, although the Compost Facility is not on an area where solid waste was actually buried. This

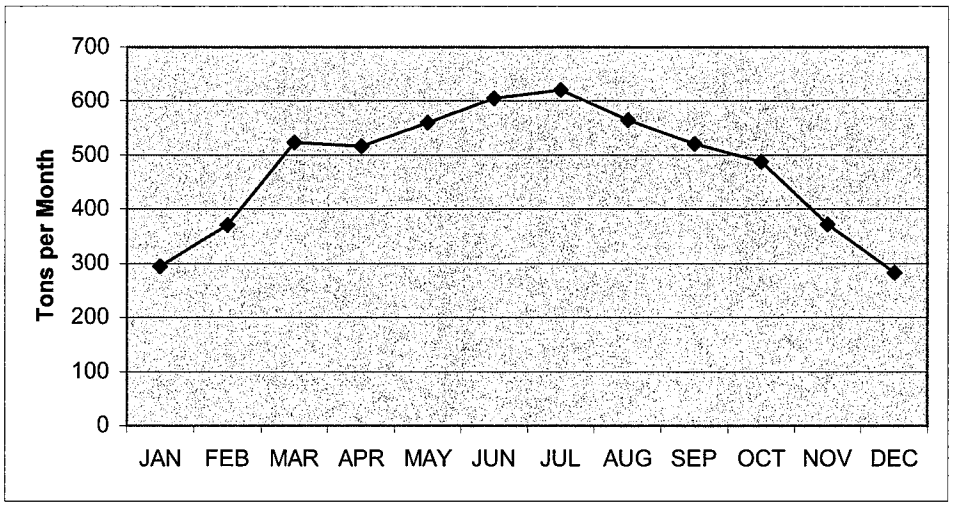
Table 5.1. Yard Debris Drop-Off Quantities (Tons).

Month:	2003	2004	2005	2006
January	273.1	268.3	363.0	369.8
February	328.8	365.0	418.0	500.0
March	364.2	713.0	650.5	592.4
April	385.1	583.3	630.0	602.3
May	541.0	509.5	600.7	753.6
June	600.0	578.7	643.0	659.7
July	470.7	576.5	807.2	817.2
August	496.8	570.9	749.3	610.7
September	400.8	468.7	864.3	552.8
October	559.4	440.9	521.1	444.59
November	370.4	453.3	320.2	413.24
December	246.5	255.7	286.7	411.65
Annual Tonnage	5,036.4	5,783.7	6,854.2	6,728.13

Note: The above figures include materials dropped off by City and County residential and commercial sources, plus tonnages from the City's curbside collection program.

Figure 5.1. Yard Debris Drop-Off Quantities

Tons per Month, Five–Year Average



Note: The above chart shows monthly averages for the period 2002 through 2006.

Table 5.2. Curbside Collection of Yard Debris in Port Townsend (Tons).

Month:	2005, Tons	2006, Tons	Five-Year Average
January	19.96	15.76	13.3
February	15.6	16.2	12.6
March	30.85	25.1	24.9
April	17.27	38.66	30.0
May	39.94	59.99	41.9
June	40.33	46.02	37.1
July	33.85	36.49	29.4
August	36.21	36.19	27.2
September	26.02	27.72	23.5
October	21.8	23.36	20.4
November	23.19	20.0	18.8
December	19.5	15.86	12.5
Annual Amount	324.52	361.35	291.6

Note: Five-year average is for 2002 through 2006.

location is nearly ideal, as it allows co-locating all of the major waste management components (Transfer Station, Recycle Center and the Compost Facility). Co-locating these facilities maximizes ease of administration, leads to efficient transfer of materials between facilities, and allows the common use of the buffer area for the old landfill. This arrangement provides the City with a facility for the cost-effective disposal of their biosolids and for septage from private contractors. In return for the use of the land, the City has agreed to be wholly responsible for the operation of the facility and mitigation of any direct impacts it may cause.

Other processing facilities: Processing of organics is also done by private firms in the County. For example, the Valley View Dairy has taken some of the surplus ground material from the Port Townsend Compost Facility and composted that with manure and spoiled feed to produce a compost that is then blended with other materials to produce a rich topsoil mixture.

Summary: Altogether, the City and other sources produced 13,835 tons of compost and mulch in 2005. The amount of solid waste generated in that year was 47,190 tons. Based on these numbers, the total composting rate for Jefferson County was 29.3% (see also Table 2.6). As can be seen in Tables 5.1 and 5.2, the amount of yard debris collected in recent years has been steadily increasing, although the amount in 2006 dropped slightly.

5.2.2 Needs and Opportunities for Yard Debris Composting

There are several needs and opportunities associated with composting in Jefferson County, but in general the current system, with the use of City's Compost Facility, is working very well.

There is currently a surplus of yard debris being received at the drop-off site. This surplus is being managed through alternative markets such as mulch, but the additional grinding costs are significant. In 2006, grinding costs amounted to about $80,000. Instituting a fee for yard debris would help control the flow of excess yard debris while providing revenues to offset the grinding costs. Changing from free drop-off to a fee-based system would also encourage greater use of other alternatives (such as on-site grinding) and provide a greater opportunity for private firms to provide composting services.

Septage amounts received at the Compost Facility are highly variable. It would be helpful to the operations if the amounts were more regular. Handling septage at the Compost Facility requires extra handling procedures, but provides an outlet for local septage and septage disposal fees help finance the operation of the Compost Facility.

Reducing the amount of organics in the waste stream is one of the five key initiatives identified in the State's Beyond Waste Plan. The Beyond Waste Plan adopts a goal of expanding the "closed' loop system of converting organic wastes into compost and other products. Included in that plan's definition of organics is yard debris, food waste, animal manures, biosolids, crop residues, wood, and low-grade or soiled paper.

There is a statewide goal to eliminate yard debris from landfills by 2012 in those areas where alternatives exist. In Jefferson County's case, the Compost Facility and private efforts provide excellent alternatives to landfilling of yard debris, but yard debris is estimated to contribute 3.1% of the waste stream still (see Table 2.5). That estimate is based on a study conducted for Clallam County however, and it would be helpful to have a more precise estimate of the amount of yard debris in Jefferson County's waste stream (see Recommendation R6).

The Department of Ecology requires control of storm water runoff from stockpiled yard debris and finished compost because of the potential for pesticide residues to leach from this material. This is typically accomplished by covering the material and/or creating an impervious concrete or asphalt pad. The cost of such construction is prohibitively expensive both in terms of capital expenditure and ecological footprint.

A better balance of incentives and disincentives would help the state meet its goal of eliminating yard debris from the waste stream while still protecting the environment. The most comprehensive action would be a State-wide phase-out of the sale and application of all toxic pesticides. In the absence of such a policy, local jurisdictions will continue to struggle with these competing goals and requirements.

5.2.3 Alternative Methods for Yard Debris Composting

Instituting a tipping fee for yard debris brought to the Jefferson County Waste Management Facility would help cover the costs of accepting and grinding the material, and may help reduce the surplus amounts by diverting part of it elsewhere. Any such tipping fee should not be set too high so as to remove the incentive for customers to keep yard debris separate from garbage.

Local markets have been proven to be sufficient for the City's compost product and currently demand for the compost exceeds supply (CH2MH 1996) to the point where consideration must be given to allocating the compost among potential users. There are certain seasons, however, when the demand for compost is lower and alternative end-markets need to be sought out. If the amount

of compost increases significantly, then additional market development may be necessary to avoid a surplus of finished product.

5.2.4 Recommendations for Yard Debris Composting

The following recommendations are made for yard debris composting (see also Recommendations PE5, R1, S11 and S12):

C1) The County will continue to partner with the City of Port Townsend to maintain and expand their biosolids composting operations. If the supply of compost increases above demand, the County and City will utilize the finished product on County and City properties and projects, when applicable.

C2) The County will promote organics reduction methods through the education program.

5.2.5 Implementation Schedules and Costs for Yard Debris Composting

Recommendation C1 will be conducted on an ongoing basis. The cost of this approach is minimal at this time, but in the future could include allocation of additional County land for the biosolids facility, a public relations and information effort, disposal costs for water from the septage and biosolids, and significant construction costs and other capital investments.

Recommendation C2 will be conducted as part of the education program, and will promote site designs for land clearing and construction projects that reduce vegetation removal, and on-site grinding and placement for the vegetation that must be removed. Education efforts will highlight the benefit of leaving leaf litter and other yard debris on site to support aquifer recharge, soil fertility, and water quality.

Recommendations C1 and C2 have both been given a high priority for implementation (see also Tables E.1 and E.2).

5.3 FOOD WASTE COMPOSTING OPTIONS

5.3.1 Existing Conditions for Food Waste Composting

Food waste could also be a candidate for composting. As other materials are diverted from the waste stream, food waste increasingly becomes one of the most prevalent materials left in the waste stream. As indicated in Table 2.5, approximately 15 percent of the waste stream, or 3,196 tons per year, is food waste. Composting a portion of this would help the County meet its waste diversion goal.

Composting of food waste is currently being done in several areas, but three good examples include:

Fort Worden: the Fort Worden State Park and Conference has a full-service kitchen that provides meals to conference attendees and walk-in guests. The scraps and other food wastes from this kitchen are being composted in a large worm bin located outside and behind the building that houses the kitchen. This system was partially funded by a grant from Ecology.

NAS Whidbey Island: this naval air station collects food waste and shredded paper from restaurants and other sources on the base, and takes that material to their compost facility on base. There, food waste is mixed with yard debris and other materials and then placed in containers with forced aeration for a few months. After the initial composting period, the material is moved to a curing pile for up to six months.

Cedar Grove Composting: this private firm is composting food waste from two distinct sources. Most of the food waste they currently handle is collected from restaurants, grocery stores and other commercial/industrial sources by garbage hauling/recycling firms and then mixed with yard debris for composting. The second source is residential curbside collection programs that have recently expanded to allow residents to put food waste, shredded paper, and compostable paper out with their yard debris for collection. In both cases, the mixed yard debris and food waste is being composted using the "GORE method," which uses a fabric covering similar to Gore-Tex and forced aeration.

5.3.2 Needs and Opportunities for Food Waste Composting

As mentioned in the previous section, the State's Beyond Waste Plan places a priority on reducing the amount of organics in the waste stream, and includes food wastes as one type of organics that should be targeted.

It is possible that food waste could be included in the mix that is processed at the City's Compost Facility. The high moisture of this material would lead to greater demand for bulking agents such as yard debris. Potential problems associated with large-scale food waste could include odors, vectors (insects and other vermin), and end-product marketability issues.

5.3.3 Alternative Methods for Food Waste Composting

There is increasing interest in food waste composting throughout the United States and in Washington State. A variety of methods are being tested, from on-site methods such as vermicomposting to separate collection systems for commercial food wastes and curbside collection of residential food waste combined with yard debris.

5.3.4 Recommendations for Food Waste Composting

The following recommendations are made for food waste composting (see also Recommendation PE5):

C3) Small-scale vermicomposting projects will be encouraged at schools and other locations. Home composting of food waste will be encouraged with public education on the proper methods for vermicomposting or incorporation into compost bins.

C4) The feasibility of collecting food waste from commercial sources will be examined.

C5) Encourage composting and other alternatives for food waste generated by businesses and institutions.

5.3.5 Implementation Schedules and Costs for Food Waste Composting

Recommendation C3 will be conducted on an ongoing basis. The cost for this activity will be largely staff time (the Waste Prevention Education Coordinator) and educational materials. This recommendation has been given a medium priority for implementation (see also Table E.2).

The feasibility of a separate collection system for food waste from large generators (commercial and institutional sources) should be examined within the next three years. The primary cost for this will be a portion of an existing staff person's time, plus possibly additional expenses in the future for pilot projects or other activities. This recommendation has been given a medium priority for implementation (see also Table E.2).

Encouraging commercial and institutional activities for food waste composting (Recommendation C5) will be conducted on an ongoing basis. The cost for this will be largely staff time (the Waste Prevention Education Coordinator) and educational materials. This recommendation has been given a medium priority for implementation (see also Table E.2).

5.4 SOLID WASTE COMPOSTING OPTIONS

5.4.1 Existing Conditions for Solid Waste Composting

A third possibility for composting is to process mixed solid waste to remove non-degradable items and compost the remainder. This approach is difficult to accomplish successfully and generally only manages to operate in special situations (typically where there is a niche market for the end product). According to a recent report (BioCycle 2005), there are only sixteen solid waste composting facilities currently in operation in the U.S. Comparing this to the fifteen facilities that were in operation in 1998, it can be seen that this technology has not been easy to implement. This technology is more widely used in Europe, where there are many more facilities that have operated successfully for several years.

Solid waste composting typically involves a number of shredding, composting and screening steps to produce a material that is somewhat similar to yard debris compost. Waste processing is required on the front end of solid waste composting facilities, where it serves the purpose of removing materials that would interfere with the composting process or the marketability of the end product, as well as recyclable materials. Screening and other processing after composting is also required, and the various processing steps create a residue that requires landfill disposal. The finished compost typically contains physical contaminants (such as bits of broken glass) and may contain chemical contaminants as well.

5.4.2 Needs and Opportunities for Solid Waste Composting

Solid waste composting requires careful attention to the markets for recovered products and the costs of construction and operation of the required facilities. The marketability of the recovered materials may be hard to determine at the design stage of the facility, since the quality of the materials cannot be certain until the facility is in operation.

There are no needs or opportunities that have been specifically identified in support of solid waste composting, although the increased diversion created would help meet the County's goal for recycling. In the case of this technology, however, this increase in diversion would be relatively

expensive, as the capital-intensive facility required for this approach causes a relatively high cost per ton for the materials recovered.

5.4.3 Alternative Methods for Solid Waste Composting

There are various options for solid waste composting. In the simplest case, this method can be used for organic-rich waste streams from specific types of commercial waste generators. In the most capital-intensive option, a solid waste composting facility could include the County's entire waste stream and would include more shredding or grinding of the incoming waste and more emphasis on removal of physical and chemical contaminants such as plastics and batteries. In any case, the actual composting step may take place in an enclosed system (typically called "in-vessel" composting), a trough that is open on top, or a variety of pile configurations.

The success of solid waste composting depends on the markets available for the end product and the cost of alternative disposal methods. Even in the best case, solid waste compost typically has much more limited applications than yard debris compost. Solid waste compost usually contains small bits of plastic and pieces of glass, since these do not break down in the composting process and even intensive shredding will only reduce them to a degree. These materials detract from the visual appearance of the compost and may cause potential customers to reject it. Concentrations of metals and other contaminants may also be a limiting factor in determining where and how the compost can be used. Hence, applications for solid waste compost are less likely to be found in urban locations, and this approach typically relies on agricultural or forestry applications. A complete cost analysis has not been conducted for this option, but the cost for solid waste composting would be very substantial.

5.4.4 Recommendations for Solid Waste Composting

No solid waste composting facilities or programs are recommended at this time. Future proposals or opportunities will be evaluated on a case-by-case basis (but see also Recommendation R8).

5.4.5 Implementation Schedules and Costs for Solid Waste Composting

An implementation schedule and cost analysis is not applicable for this section, since no facilities or programs are being proposed.

This page intentionally left blank to facilitate double-sided printing.

CHAPTER 6: COLLECTION AND IN-COUNTY TRANSFER

6.1 INTRODUCTION

The solid waste management activities discussed in this chapter are organized into two sections:

6.2 Solid Waste Collection
6.3 In-County Transfer

6.2 SOLID WASTE COLLECTION

6.2.1 Existing Conditions for Solid Waste Collection

Existing Collection Services

Solid waste is collected in the City of Port Townsend through a contract, and in other parts of the County through state-issued certificates (franchises). The County can be further divided into east and west areas due to the different conditions that exist in each part. These three areas are discussed in greater detail below.

A single hauling company, Waste Connections, Inc., provides most of the garbage collection services in Jefferson County under a variety of contracts or certificates. Another garbage hauler, West Waste & Recycling, Inc., operates in the west end of the County and provides service to a small number of customers. For the purpose of distinguishing between the contract and certificated operations for Waste Connections, this SWMP uses "DM Disposal" when referring to the City's collection system, and "Murrey's Olympic Disposal," or just "Olympic Disposal," for the certificated system.

City of Port Townsend: The City of Port Townsend has a contract with DM Disposal to provide collection services to homes and businesses within the city. DM Disposal conducts the billing for these services, and rates are based on the volume of garbage produced (see Table 6-1). The City's residential garbage service is provided every-other-week, with curbside recycling services provided during the "off-week." This approach reduces collection costs while increasing recycling participation.

East County area: In the eastern part of Jefferson County, collection services are provided under a certificate granted by the State, through the Washington Utilities and Transportation Commission (UTC). Any changes in rates or services in certificated areas must be approved by the UTC.

The UTC certificate (Certificate G-9) grants Murrey's Olympic Disposal the exclusive right to provide waste collection services to residents and businesses in the eastern unincorporated areas of the County. Olympic Disposal has several trucks and other pieces of equipment, including rear packer trucks, trucks that can empty containers (dumpsters) that are one, two and three cubic yards, and tilt frame (roll-off) trucks for hauling drop boxes with capacities of 10, 20, 25, 30, 35, 40 and 50 cubic yards in size. Olympic Disposal also collects solid waste in Clallam County.

Residential collection services offered by Olympic Disposal in the eastern and western parts of the County include options for garbage collection on a weekly, every-other-week or once-monthly

Table 6.1. Collection Rates in Jefferson County.

Area	Population Density [1]	Residential Collection Rates [2]				Commercial Collection Rates [3]		
		Mini-can	1 can (32 gal)	2 cans	Recycling	1 yard/wk	2 yards/wk	6 yards/wk
Port Townsend	2.2	$9.21	$14.75	$29.49	Included	$85.04	$161.12	$483.36
Murrey's Olympic Disposal, eastern part of county	0.02	$14.99	$18.76	$27.73	$6.94	$80.36	$158.21	$420.75
Murrey's Olympic Disposal, western part of county	0.002	$12.61	$15.85	$23.66	$6.94	$67.20	$132.75	$326.27
West Waste & Recycling	0.002	$12.70	$15.45	$23.50	na	$60.62	$119.94	$363.72

Notes:

1) Population densities (people per acre) shown here are based on the 2000 Census results (OFM 2002) and land area as of the year 2000:

	2000 Population	Land Area, acres	Density
Port Townsend	8,334	3,860	2.2
Unincorporated County	17,619	1,157,200	0.02
Unincorporated, East End only	17,022	917,200	0.02
Unincorporated, West End only	597	240,000	0.002
Totals	25,953	1,161,100	0.02

2) Residential collection rates refer to monthly charges for weekly pickup of the number of cans shown.

3) Commercial collection rates vary significantly depending on the size of the container and frequency of service. A few rates are shown in the above table to illustrate the range of rates associated with different waste volumes (all of these rates are based on one pickup per week at the volume shown). Additional charges may apply for container rental, recycling services, access problems, overflow conditions and other factors. Note that the 6-yard rate shown for Port Townsend is actually for 3 2-yard containers (which is the closest match in their service levels).

basis. The rates currently charged in eastern Jefferson County (as of 2006) are shown in Table 6-1. The additional cost for recycling collection service provided by Olympic Disposal is $6.92 per month and collections are every-other-week. For commercial customers, garbage rates range from $62.35 per month for once-weekly pickup of a one-yard container to $346.40 per month for once-weekly collection of a 40-yard container. Additional fees are assessed for temporary accounts, special (unscheduled) pickups, overfull containers and other services.

West County area: In the western part of Jefferson County, collection services are also provided under certificates granted by the UTC. In this case, however, two companies have certificates to collect garbage in this area: Olympic Disposal and West Waste & Recycling (West Waste). West Waste is headquartered in Forks and also collects garbage in western Clallam County.

Collection rates charged by Olympic Disposal on the west end are slightly lower than the rates shown above for the eastern part of the County, based on the lower fee charged by the disposal site (the Port Angeles Landfill) used for waste from this area. Rates charged by Olympic Disposal for recycling (alone or combined with garbage collection) are the same as in the eastern area. Rates charged by West Waste are similar to the rates charged by Olympic Disposal.

Existing Rules and Regulations

State Regulations: The UTC supervises and regulates garbage collection companies. Their authority (Ch. 81.77 RCW and Ch. 480-70 WAC) is limited to private collection companies and does not extend to municipal collection systems (of which there are none in Jefferson County) or to private companies operating under contract to a city (such as in Port Townsend). For private haulers under their jurisdiction, the UTC may require reports, set rates, regulate service areas, and establish safety practices. Solid waste management plans may set standards for specific levels of services that the haulers must then adhere to (although this generally also requires adoption of a service ordinance).

Cities and towns have four options for managing solid waste collection under State laws. None of these options prevent a resident or business from hauling their own waste. These options are:

- a city may operate its own municipal collection system.
- a city may contract with a garbage hauler for collection services in all or part of the city, as is done in Port Townsend.
- a city may require a certificated collector to obtain a license from the city.
- if a city does not wish to be involved in managing garbage collection within its boundaries, collection services can be provided by certificated collectors that are overseen by the UTC.

Other regulations include motor vehicle noise performance standards that apply to trucks transporting solid waste (Ch. 173-62 WAC). There are also weight limits, emissions standards and other regulations regarding motor vehicles that apply to garbage trucks. More stringent emissions standards for diesel engines went into effect in 2002 and 2004, and in 2007 the allowable emission levels will become even stricter for new engines. The 2007 emissions standard will be met in part by lowering the sulfur content of diesel fuel.

State regulation RCW 46.61.655 applies to people that are self-hauling their garbage and other materials. This regulation requires that loads be secured, and increases the fines for loads that are not secured.

Local Regulations: Garbage collection service fees are mandatory in Port Townsend, but not in other parts of the County. Additional provisions for garbage collection are contained in Chapter 6 of the City's municipal code.

6.2.2 Needs and Opportunities for Solid Waste Collection

The current collection system provides adequate capacity for the County's and City's residents and businesses, although these services are not always utilized as much as they should be (as evidenced by the illegal dumping and "junk property" problems in the county). Future waste quantities have been estimated (see Table 2.4), and the existing collection system is anticipated to be able to handle the projected increase. In the event of changes to the UGAs, the collection companies may need to adjust their services to provide a higher level of service as might be considered appropriate for an urban area. The increasing average age of the population in Jefferson County (see Section 2.2.2) may also create shifts in services, such as changing the proportion of people in the unincorporated areas that subscribe to garbage collection services versus self-haul their wastes.

6.2.3 Alternative Methods for Solid Waste Collection

Alternatives to the current collection system include changes in the City's contract and a service ordinance for other areas of the County, which could be used to institute new programs or services in the City or County, respectively. Other options could include changes in the collection rate structure, mandatory garbage collection and co-collection.

Collection Rates

There are several options possible for structuring collection rates, but generally the best approach for equitable services and encouraging waste diversion is the use of volume-based fees and "embedding" the cost of recycling and yard waste collections in the base fee for garbage (SERA 1996 and SRM 1999). The collection programs in Jefferson County already use volume-based rates for both residential and commercial customers and, in Port Townsend, the cost for recycling and yard waste collections are already embedded into the basic fees for garbage collection.

In the certificate areas of the County, fees for recycling are in addition to the garbage collection fee. Although it can be argued that residential (and commercial) customers can reduce garbage collection fees by diverting part of their materials to the less-expensive recycling service, this is still not the best approach for encouraging recycling. A better option would be to embed the cost of recycling into the garbage collection rates, through either a "mandatory pay/voluntary participation approach" or the use of incentive rates. Incentive rates, such as Waste Connections offers in Pierce County, help to encourage recycling because the combined rate for garbage and recycling services is lower than the rate for the same level (i.e., same number of cans) of garbage service alone. Implementing either the mandatory pay/voluntary participation approach or incentive rates in the certificate areas would require that the County adopt a service level ordinance that provides the foundation for this approach.

Mandatory Garbage Collection

Another alternative to meet collection needs for Jefferson County is mandatory garbage collection services. Currently about 32% of the County's population is in areas where payment for collection service is mandatory (Port Townsend), and the other 68% of the population is in largely rural areas where subscription to collection services is voluntary.

Mandatory collection programs throughout the rest of Jefferson County would provide some benefits, but not without possible drawbacks. Benefits include a reduction in illegal dumping; a reduced need for enforcement of illegal dumping, littering and other laws; and greater ability to provide curbside recycling programs (assuming a combination of recycling and garbage services). Mandatory collection, however, can act as a disincentive for those who are actively trying to reduce wastes if the rate structure is too rigid and can be potentially very difficult to implement.

Mandatory collection in unincorporated areas could be provided through a solid waste collection district. State law (Ch. 36.58A RCW) enables a county to establish such a district. The concept of a solid waste district is discussed in greater detail in Chapter 8.

Co-Collection of Waste and Recyclable Materials

The County could potentially benefit from co-collection, but the City is close enough to the disposal and recycling facilities that there would be no real advantage (and the current system of alternating weeks for garbage and recycling doesn't allow a co-collection approach). Co-collection is the collection of waste and recyclable materials (or yard debris) at the same time. Co-collection is accomplished using methods that fall into two general approaches:

- Bin-Based Methods: Using one truck with two or more compartments to hold the different materials (garbage in one compartment and recyclable materials in one or more other compartments). The compartments are then emptied separately at two different facilities.
- Bag-Based Methods: Using special bags to hold recyclables (or yard debris), which are then collected in the same compartment as bags of garbage and recovered later after the load is deposited on the floor of a transfer or processing facility.

The advantage of co-collection is that collection costs and truck traffic can be reduced. Potential disadvantages include the inefficiencies that result from incorrectly-sized compartments (for bin-based methods) or the loss of recyclable materials due to bag breakage (for bag-based methods). Several co-collection programs have been tried in other areas and failed due to such problems.

6.2.4 Recommendations for Solid Waste Collection

There is only one recommendation being made at this time for solid waste collection:

WC1) Certificate haulers and municipal contracts will continue to use variable rate structures such as volume-based rates, and incentive rates will be implemented by the certificated haulers to encourage recycling by their residential customers. The implementation of incentive rates will require that the County first adopt a service ordinance addressing this rate structure. Additional incentives and alternative rate structures that promote waste reduction and recycling should also be considered.

6.2.5 Implementation Schedules and Costs for Solid Waste Collection

The County will adopt a service ordinance providing the foundation for incentive rates in the certificate areas by June 2009. The certificated haulers will institute incentive rates with the next change in rates after adoption of the service ordinance, to avoid the expense of a separate filing with the UTC, but no later than December 2010.

This recommendation has been given a medium priority for implementation (see also Table E.2).

6.3 IN-COUNTY TRANSFER

6.3.1 Existing Conditions for In-County Transfer

The Quilcene Drop Box is the one drop box station remaining in operation in Jefferson County. Four other drop box stations were closed in 1998 and 1999, including the Port Hadlock, Brinnon, Clearwater and Coyle facilities, due to excessive operating costs. The Port Hadlock site is owned by the County and is being converted to a recycling drop-off facility.

The Quilcene Drop Box, is located off of Highway 101 about 23 miles south of the Jefferson County Waste Management Facility. The Quilcene Drop Box handled 215 tons of waste from 3,599 vehicles in 2006, and took in $42,499 in revenues from tipping fees for this waste. Jefferson County owns and operates the Quilcene Drop Box, but has a contract with Olympic Disposal to haul full containers of waste to the Jefferson County Waste Management Facility. This site is staffed and the current hours of operation are from 1 to 5 p.m. Monday, Wednesday and Friday, and 9 a.m. to 5 p.m. on Saturday. Fees charged at this facility range from $2.97 for a mini-can or $4.95 for a 32-gallon can, up to $27.23 per cubic yard for larger loads. A few items have separate or additional charges, such as car tires ($4.95), truck tires ($6.19) and refrigerators ($19.80). All of these fees are excluding taxes.

The transfer station at the Jefferson County Waste Management Facility (JCWMF) is the primary disposal facility in the County and it serves the waste export system. The JCWMF is built on the site of the closed County landfill, at 325 County Landfill Road, south of Port Townsend. Other facilities at that site include the recycling center and the biosolids composting facility. The JCWMF handled 20,912 tons of waste from 69,383 vehicles in 2006, and took in $2,366,391 in revenues from tipping fees for this waste. This site is staffed and the current hours of operation are from 9 a.m. to 4:30 p.m. Monday through Saturday (except holidays). Fees charged at this facility range from a minimum charge of $4.95 up to $110.00 per ton for larger loads. A few items have separate or additional charges, such as refrigerators ($19.80). All of these fees are excluding taxes.

The design and operation of the JCWMF is currently being studied and this facility will likely undergo significant change in the next few years. The results of that study were not yet available at the time this plan was prepared.

6.3.2 Needs and Opportunities for In-County Transfer

More education is probably needed to inform customers of the transfer station, drop boxes and recycling facilities as to the materials that cannot be brought there, and the alternatives that exist for the proper disposal or handling of those materials.

According to State law (36.58.030 RCW), transfer stations need to be financially self-supporting, but this requirement does not apply to the Quilcene Drop Box because it does not accept waste from garbage hauling trucks (and so does not meet the definition of a "transfer station" per that state law). This requirement does, however, apply to the JCWMF.

6.3.3 Alternative Methods for In-County Transfer

Operation or ownership of drop box sites can be by either the public or private sector.

An option for serving the residents of the County's west end would be to implement a regional effort with Clallam and possibly also Grays Harbor Counties. The west end of Clallam County is currently being served by a separate waste export system. The waste export containers for Clallam County's west end are being transported south through Jefferson County, and so there may be an opportunity to include Jefferson County's west end in this system. This concept is being called the "north-south corridor," and actual implementation of this option would require that several details be resolved, such as maintaining the interests and involvement of several private companies and municipal agencies.

In areas once served by drop boxes, residents and businesses can instead use garbage and recycling services provided by certificated haulers or self-haul to facilities that are still open.

6.3.4 Recommendations for In-County Transfer

The following recommendation is made for the transfer system in Jefferson County (see also Recommendations WE1 and PE4):

T1) The County will continue to evaluate options for maintaining drop box service in the unincorporated areas of the County.

6.3.5 Implementation Schedules and Costs for In-County Transfer

The only immediate cost for the continued evaluation of drop box service options is a limited amount of staff time (for existing staff). If a new site were developed, however, there would be significant capital expenses (for land, building, equipment, etc.) and other costs (such as grading and other site preparation, access control measures, and utilities).

This recommendation has been given a medium priority for implementation (see Table E.2).

This page intentionally left blank to facilitate double-sided printing.

CHAPTER 7: DISPOSAL

7.1 INTRODUCTION

The solid waste management activities discussed in this chapter are organized into three additional sections based on the type of disposal method:

7.2 Incineration
7.3 In-County Landfilling
7.4 Waste Import and Export

7.2 INCINERATION

7.2.1 Existing Conditions for Incineration

Background

Incineration can be used to reduce the amount of waste requiring landfill disposal. When used with an energy recovery system, it can also be a method of producing electricity and/or heat.

Pyrolysis involves heating waste or other materials to high temperatures in the absence of oxygen. The lack of oxygen is the factor that separates pyrolysis (and other types of thermal oxidation methods) from traditional incineration technologies. Some feel that pyrolysis is not equivalent to other types of incineration, but the basic principles (the application of heat to reduce solid waste volumes and the production of residues such as ash) are sufficiently similar that pyrolysis is included in this section.

Incineration Activities in Jefferson County

According to the Olympic Region Clean Air Agency (ORCAA 2007), there are currently no incinerators in Jefferson County permitted for general solid waste. There are two facilities permitted to burn wood waste as hog fuel, Allen Logging and Port Townsend Paper Company, and Jefferson County Animal Services has a permit to operate a veterinary incinerator. The flare station for landfill gas at the closed Jefferson County Landfill also has an air quality permit. There are no hospitals or clinics that currently have permits to incinerate biomedical waste.

Existing Incinerators in Other Areas

A number of incinerators have operated in other parts of the state. Spokane County and the City of Spokane jointly operate an incinerator using "mass burn" technology. This facility is functioning well although it has experienced occasional problems with air quality, and the cost of operation has not dropped to the lower levels of earlier projections. As a result, the Spokane area has one of the highest disposal costs in the state. The City of Tacoma incinerated part of its garbage until early 1998 and for brief periods since then, using a Refuse-Derived Fuel (RDF) process to prepare it for incineration and energy recovery at a local power plant. The city pursued, but was unable to get, a permit to operate the plant permanently. Incinerators in Skagit and Whatcom Counties also experienced problems, and both of those are now closed.

7.2.2 Needs and Opportunities for Incineration

There is a need for disposal services for solid wastes now and in the future, although those needs are currently being met satisfactorily by the waste export system.

7.2.3 Alternative Methods for Incineration

There are several options and variations possible with incineration. These options include different technologies, waste streams, and system and equipment designs. Incineration of solid waste is an effective method of volume reduction, although the greater expense of incineration compared to other solid waste disposal methods is a limiting factor. Incineration is generally considered where there are environmental concerns with other disposal options; a market exists for energy recovered from waste combustion; and/or where population densities are high and land is scarce. At the present time, there appear to be no factors that would favor incineration in Jefferson County over other disposal methods.

7.2.4 Recommendations for Incineration

No recommendations are being made for incineration. Any incineration projects that may be proposed in the future will need to be evaluated based on an objective review of the potential impacts to human health and environmental quality, as well as a comparison to alternative disposal methods.

7.2.5 Implementation Schedules and Costs for Incineration

The potential value of incineration will be reassessed in all future revisions of this SWMP.

7.3 IN-COUNTY LANDFILLING

7.3.1 Existing Conditions for In-County Landfilling

Jefferson County Landfill

Jefferson County operated a municipal landfill from 1973 until April 1993, when it was closed and replaced with a transfer station. The Jefferson County Waste Management Facility serves the waste export system (see Section 7.4). Upon closure, the landfill was capped with a geomembrane layer and soil, and a monitoring period began. The monitoring period is expected to continue for 20 years, or longer if the landfill has not stabilized by the end of this period (stability will be indicated by the lack of gas production, leachate contamination and settlement). A landfill gas system has been installed and the gas is drawn to a flare station to be burned off. Although closed, there is a small amount of space at the landfill that could be used for inert wastes.

Over the past few years, monitoring wells located around the landfill have detected very low concentrations of chemicals leaching from the landfill and from a septage lagoon that was operated next to the landfill. These wells are located upgradient, to test the groundwater before it travels under the landfill, and downgradient, to test the groundwater after it may have been impacted by the landfill.

Other In-County Landfills

Port Townsend Paper Company operates an inert landfill for disposal of ash from a hog fuel boiler and grit from a limekiln. There were 9,645 dry tons of waste deposited in this landfill in 2005. At this rate, the landfill is expected to be able to operate until about 2050. There are monitoring wells located around this landfill to test for groundwater contamination, and the waste material being landfilled is tested daily. Daily testing is conducted for pH, and annual testing is conducted to ensure metal concentrations remain low.

The Navy operates an inert waste landfill on Indian Island. This landfill is used for a few tons per year of concrete and asphalt from that base's demolition and construction activities, and no waste is permitted to be brought to it from outside sources. At the current rates of disposal, the life expectancy of this landfill exceeds 20 years (the expected closure date is 2064).

There are no other known landfills currently operating or undergoing monitoring in Jefferson County at this time.

7.3.2 Needs and Opportunities for In-County Landfilling

Jefferson County's closed landfill will need to be monitored for at least seven more years. Most of the contaminants found have been decreasing in concentration, except for increasing levels of nitrates in one monitoring well (Monitoring Well #5, near the old septage lagoon). None of the contaminants are at levels that require remedial actions at this time.

One possible need is related to the issue of old dumps throughout the County. Several of these small dumps were created over the years, prior to the implementation of modern landfilling methods. Only a few of these dumps have been examined, and for most of these sites the records are lacking or insufficient as to the size, location and contents.

Current standards for solid waste landfills are primarily contained in the State's Minimum Functional Standards, Chapter 173-351 WAC. Chapter 173-351 contains standards for planning, siting, operating and closing solid waste landfills. Standards for other types of disposal facilities (primarily limited purpose and inert waste landfills) are addressed by a new set of standards (Ch. 173-350 WAC, the Solid Waste Handling Standards) that became effective February 10, 2003. Ch. 173-350 WAC no longer allows lower standards for other types of special landfills, such as demolition waste landfills, and these are essentially now treated the same as municipal solid waste landfills. The County Solid Waste Regulations also contain disposal site standards.

7.3.3 Alternative Methods for In-County Landfilling

Options that include the use of an in-county landfill for municipal solid waste have not been fully explored. The disposal needs of the County are being satisfied by the waste export system, and siting and operating a landfill in a relatively wet and mountainous region such as the Olympic Peninsula would not be easy.

Additional inert waste landfills may be desirable in the future, but current needs for special and inert wastes are being met with the existing Navy and Port Townsend Paper Company landfills. These types of landfills typically provide a cost-effective disposal option for local industries without excessive environmental impacts.

7.3.4 Recommendations for In-County Landfilling

There is only one recommendation being proposed at this time for in-county landfilling:

L1) Old dump sites that are known to exist in the County must be documented and inspected, with the goal of developing an assessment of their long-term liability.

7.3.5 Implementation Schedules and Costs for In-County Landfilling

Documentation and inspection of old dumps should occur over the next five years, with the goal of developing an appropriate plan for dealing with these. The cost for this activity could be only a small amount of staff time and other costs, but could also be as high as $25,000 to $50,000 per year depending on the level of effort. This is a responsibility of the Jefferson County Environmental Health Division. If a site were discovered that was in immediate need of cleanup, costs would be substantial and funds for this could be requested from Ecology's Remedial Action grant program.

This recommendation has been given a low priority for implementation (see also Table E.3).

7.4 WASTE IMPORT AND EXPORT

7.4.1 Existing Conditions for Waste Import/Export

Waste export and import refer to the practice of moving solid waste across county lines. Waste import means moving waste into Jefferson County, and waste export refers to transporting waste out of the county.

Existing Waste Import Activities

There are currently no shipments of solid waste into Jefferson County, although the City's Compost Facility is permitted to receive septage from Clallam County.

Existing Waste Export Activities

Many counties have adopted the waste export option because of its lower cost and greater reliability. Private companies have responded to this interest by developing large landfills capable of handling wastes from several areas. For many counties, these landfills provide a less expensive and more convenient means of disposal than an in-county landfill.

Jefferson County began exporting solid waste in 1993 when the County entered into a five-year contract with Regional Disposal Company (RDC). This contract was to transport waste from the Jefferson County Waste Management Facility and dispose of it at RDC's landfill in Klickitat County, Washington. The initial term of this contract was five years, with up to three five-year renewals allowed.

In 1998, the waste export contract was re-bid. Starting in August 1998, Jefferson County's waste was shipped to the Port Angeles Landfill under a six-month contract to allow time for new bids to be received and evaluated. Jefferson County received two bids in September 1998 in response to the Request for Proposals (RFP) for waste export services.

The County accepted the bid from RDC and a contract was approved in April 1999. The contract is for a 20-year period with buy-out options every five years, and it provides for an annual escalation of 90% of the CPI. Another provision allows flexibility if a regional approach with a neighboring county is proposed.

Waste export is also occurring from the west end of the County through separate, private efforts of the two haulers active in that area. Waste collected from that area by West Waste is brought to their transfer station in Forks, placed in shipping containers, and then transported back through the County to Grays Harbor County and eventually disposed in the same regional landfill that the bulk of the County's waste is disposed at (RDC's landfill in Klickitat County). Waste collected by the other certificated hauler, Olympic Disposal, is brought to the Regional Transfer Station in Port Angeles and is handled through their waste export system.

The only other waste export systems in use in the County are for small quantities of special wastes (such as biomedical waste, see Chapter 9) that are sent to special facilities outside of the County.

The Jefferson County Waste Management Facility is the designated disposal facility for all municipal solid waste generated in Jefferson County, except for waste from the west end.

7.4.2 Needs and Opportunities for Waste Import/Export

Waste Import Needs and Opportunities

Importing the amount of waste into Jefferson County that would provide additional economies of scale would also require a significant investment in capital improvements for the transfer station and other costs. A substantial amount of solid waste importation is not considered feasible at this time, although this may change if a neighboring county suffered an emergency situation.

Waste Export Needs and Opportunities

One of the more feasible opportunities for waste export may be the use of a north-south route to handle the waste generated in the western portions of both Clallam and Jefferson Counties. The west ends of these counties are currently not easily served by the main disposal systems of each county because of the transportation barrier presented by the Olympic Mountains, although these areas are currently being served through the private efforts of the two haulers with certificates in those areas.

Another possibility for waste export is a barge system that would serve more than Jefferson County. A tugboat and barge could potentially conduct a regular "milk run" to pick up containers of waste from several areas in the Puget Sound region and then deliver that waste to the Port of Tacoma or other locations.

7.4.3 Alternative Methods for Waste Import/Export

Waste Import Alternatives

Options for importing solid waste into Jefferson County include importing waste to the Jefferson County Waste Management Facility and variations on service arrangements for the west end.

Importing waste to the County's primary waste management facility near Port Townsend, the Jefferson County Waste Management Facility, is not considered to be feasible or cost-effective. Clallam County is the only source that could feasibly do this, and the distance from the center of their waste generation area (i.e., the Port Angeles-Sequim area) would make it uneconomical to transport the garbage in collection vehicles. Instead, solid waste from Clallam County would need to be put in larger containers to be transported, and at that point it would be easier and more cost-effective to send the garbage south for disposal instead of bringing it up to the Port Townsend area. Other areas would need to transport waste to Port Townsend using ferries or, in the case of Kitsap County, transport their waste north only to have it shipped south again over the same route. Neither of these options would appear to be cost-effective.

Another alternative for waste import might be to use a site in the Clearwater area to handle waste from Clallam County's west end. The Clearwater Drop Box Station has been closed, however, so any future operations in that area would require a new facility, which would be a significant expense for the small amount of waste there.

Waste Export Alternatives

As previously mentioned, there are several provisions in the current waste export contract that allow flexibility in future arrangements. One of these would allow Clallam County to become party to this contract. This would not require waste to be physically brought to Jefferson County or combined at another site, but could be accomplished through other arrangements.

Another alternative is to export waste from western Jefferson County through a different system (see above discussion of the "north-south corridor").

Conducting waste export through a barge system would need larger volumes of waste than generated in Jefferson County, and so would require coordination of waste export contracts among several municipalities. As such, this option would require long-range planning.

7.4.4 Recommendations for Waste Import/Export

Waste Import

No recommendations are being made for waste import.

Waste Export

The following recommendation is being made for waste export:

WE1) The implementation of a "north-south corridor" to serve the western ends of both Jefferson and Clallam Counties is recommended, although further discussions will be needed to determine implementation details.

7.4.5 Implementation Schedules and Costs for Waste Import/Export

Waste Import

Not applicable.

Waste Export

Further discussions of the feasibility of a north-south corridor to serve the western portions of Jefferson and Clallam Counties should occur over the next two years, involving representatives of the two counties, both private haulers active in those area, the Solid Waste Advisory Committees of both counties and possibly others. Interlocal agreements would likely be necessary to implement this approach.

This recommendation has been given a low priority for implementation (see Table E.3).

This page intentionally left blank to facilitate double-sided printing.

CHAPTER 8: REGULATION AND ADMINISTRATION

8.1 INTRODUCTION

The purpose of this chapter is to review the regulatory and administrative activities in Jefferson County for solid waste.

8.2 REGULATION AND ADMINISTRATION

8.2.1 Existing Conditions

At the federal and state levels, the primary regulatory authorities for solid waste management are the Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology), respectively. Jefferson County is in the jurisdiction of the southwest regional office of Ecology, located in Lacey, Washington. At the local level, the responsibility for solid waste administration and enforcement is shared among several departments of Jefferson County and the City of Port Townsend.

Federal Level

At the federal level, the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Solid Waste Disposal Act Amendments of 1980 (42 U.S.C. 6901-6987), is the primary body of legislation dealing with solid waste. Subtitle D of RCRA deals with non-hazardous solid waste disposal and requires the development of a state comprehensive solid waste management program that outlines the authorities of local, state and regional agencies. Subtitle D requires that the state program must prohibit "open dumps" and must provide that all solid waste is disposed in an environmentally-sound manner.

Locally, the naval installation on Indian Island is the only federal facility in the County directly involved in solid waste management. As mentioned in the previous chapter, this facility operates an inert landfill for the disposal of concrete from on-site demolition activities. This facility also currently has a permit for bioremediation of petroleum-contaminated soil, although this is not actively being conducted at this time. Other aspects of their solid waste management system are handled through local services and programs. A provision of RCRA requires that federal facilities comply with substantive and procedural regulations of state and local governments, and so military installations and federal agencies must operate in a manner consistent with local solid waste management plans and policies.

State Level

The State Solid Waste Management Act, Chapter 70.95 the Revised Code of Washington (RCW), provides for a comprehensive, statewide solid waste management program. Ch. 70.95 RCW assigns primary responsibility for solid waste handling to local governments, giving each county, in cooperation with its cities, the task of setting up a coordinated county solid waste management plan that places an emphasis on waste reduction and recycling programs. Enforcement and regulatory responsibilities are assigned to cities, counties, or jurisdictional health departments, depending on the specific activity and local preferences.

The Minimum Functional Standards for Solid Waste Handling (Ch. 173-304 WAC) were promulgated by Ecology under the authority granted by Ch. 70.95 RCW. This chapter has now been superceded by Ch. 173-351 WAC, Criteria for Municipal Solid Waste Landfills, which contains the current standards for landfills, and Ch. 173-350 WAC, Solid Waste Handling Standards, which addresses the operational and other requirements for recycling and composting facilities as well as inert and special purpose landfills.

Chapter 36.58 RCW, Solid Waste Disposal, establishes the counties' rights and responsibilities regarding solid waste management, including the authority to establish solid waste disposal districts. The authority to establish solid waste collection districts is provided in Chapter 36.58A.

Federal, State and local air quality regulations may apply to specific activities in Jefferson County, especially ORCAA (Olympic Region Clean Air Agency) Regulation 1 and Ch. 173-400 and 173-460 WAC. These regulations include requirements for odor, fallout and other potential air quality impacts. As part of these requirements, pre-approval by ORCAA may be necessary for modifications in existing sources and construction of new sources, including landfills, transfer stations, composting facilities and incinerators, that may affect air quality.

Other relevant State legislation includes Washington's Model Litter Control and Recycling Act. The Model Litter Control and Recycling Act (Ch. 70.93 RCW) and associated State regulations (Ch. 173-310 WAC) generally prohibit the deposit of garbage on any property not properly designated as a disposal site. There is also a "litter fund" that has been created through a tax levied on wholesale and retail businesses, and the monies from this fund are being used for education, increased litter clean-up efforts, and grants to counties for illegal dump clean-up activities.

Local Level

In Jefferson County, the local governmental organizations involved in solid waste management include the Jefferson County Department of Public Works, the Jefferson County Environmental Health Division, and the City of Port Townsend. The Jefferson County Solid Waste Advisory Committee (SWAC) also plays an important role in administering the solid waste management system in Jefferson County. Each of these entities has a particular area of operations, providing specific services to the residents within that area and enforcing specific rules and regulations.

Local rules that affect solid waste management include ordinances, land use plans and zoning codes.

Jefferson County Department of Public Works: At the county level, the Department of Public Works is the agency primarily responsible for solid waste management activities for Jefferson County. The Jefferson County Department of Public Works operates the Transfer Station and the Quilcene Drop Box, manages the Recycle Center lease and the waste export contract, and operates the MRW Facility. Staffing includes dedicated personnel, such as a solid waste operations coordinator, scale attendant, part-time transfer station attendants and drop box site attendants, and assistance as needed from the director, solid waste manager and solid waste coordinator. Altogether, 7.75 full-time equivalents (FTE's) were funded from the 2006 solid waste budget.

Jefferson County utilizes an enterprise fund for the solid waste management system. The premise of this approach is that expenditures must be matched by revenues from service fees and other appropriate mechanisms. Total expenditures by Jefferson County for solid waste activities in 2006 were projected to amount to $1,908,000. The revenues to pay for these expenses came primarily

from tipping fees plus some grant and bond funds. The bond funds are unexpended funds from a previously-issued bond. Table 8.1 shows more detail on budget and expenditures for 2005, 2006 and 2007.

Jefferson County Environmental Health Division: The Environmental Health Division of the Jefferson County Public Health Department is the local enforcement agency for County and State regulations regarding solid waste activities. Whenever the situation is not covered by County ordinances, Environmental Health enforces State regulations. The Environ-mental Health Division is the responsible local authority (per RCW 70.95.160) for issuing permits for solid waste facilities, and inspects and monitors the closed landfill and all other facilities that may impact human health. The Environmental Health Division is also responsible for public education activities in Jefferson County (see Section 3.4 for more details).

The permit process for disposal facilities requires an application and approval for new sites, and an annual review and renewal for existing permits (although permits can be renewed for up to five years in some cases). The initial application form, developed by Ecology, requires information about the types of waste to be disposed, environmental conditions of the area and operating plans. Permit fees are based on the relative risk of environmental and public health threats as a measure of the degree of regulatory monitoring needed.

Table 8.1. Jefferson County Solid Waste Budget (in thousands).

	2005[1]	2006[1]	2007[1]
Revenues			
Tipping Fees	$2,290	$2,288	$2,555
MRW Fees	7	8	5
Refuse Taxes	38	44	35
Grants	34	40	60
Other	36	286	27
Total Revenues	2,405	2,666	2,682
Expenses			
Closure of Old Landfill	12	8	12
Transfer Station	269	191	291
Long Haul	1,019	1,087	970
Drop Box Operations	19	16	20
Moderate Risk Waste Operations	93	76	91
Recycling and Education Program	202	188	220
Administration and Planning	225	293	315
Total Expenses	1,839	1,859	1,919
Debt Service	157	146	165
Equipment Replacement Fund	148	147	150
Balance	261	514	448

Notes: All figures are in dollars.
1. The 2005 and 2006 budget figures are the actual amounts, and the 2007 figures are the budgeted amounts.

Unpermitted and illegal sites are a problem in the County. Private residential dumps have created nuisance problems in some areas. The process for addressing this can be slow. Illegal dumping enforcement may be addressed through enforcement of State laws regarding solid waste disposal (Ch. 173-350 WAC) or Jefferson County ordinances concerning solid waste disposal and or littering. Generally, enforcement of solid waste laws and regulations is the responsibility of the Jefferson County Environmental Health.

Jefferson County Public Health currently receives grant funding from Ecology to remove junk vehicles from the county. Public Health also has a grant from Ecology to fund the salaries and benefits of staff for enforcement of junk vehicle removal. The County will continue to apply for grants available from Ecology to fund these programs.

A quick survey of western Washington counties revealed a number of approaches to funding, staffing, and lead agency roles for junk vehicle removal programs. The more effective programs appear to employ a wide range of funding sources and multiple agency coordination. Jefferson County Public Health and Public Works have begun discussing long term funding for abatement and junk vehicle issues in the county. "Abatement" is a legal process whereby a warrant is issued by the legal system and the property is then forcibly brought into compliance. Abatement is performed after all other enforcement options have been exhausted.

City of Port Townsend: The Public Works Department for the City of Port Townsend is involved in solid waste management in several ways, including operating the Port Townsend Biosolids Compost Facility and managing the contract for garbage collection (with assistance from other city staff as needed). The City of Port Townsend's solid waste programs are funded through residential and commercial garbage collection fees.

Illegal dumping and litter control within the City is enforced through the Municipal Code (Chapters 6.04 and 6.12), plus the Uniform Housing Code as it applies to nuisance abatement. Another City Code that merits attention here is the City's ban on using polystyrene foam packaging for food. This ban on the "unlawful use of harmful packaging materials" was adopted in 1989 as Chapter 6.20 of the City code, and is effective only within City limits.

Tribal Councils: As mentioned in Chapter 1, there are three Tribes that are located or active in Jefferson County (the Hoh, Quinault and Jamestown S'Klallam Tribes). The Tribes are governed by a Tribal Council or Committee made up of elected members. The Councils hold regular meetings and handle the business affairs of the Tribes. These Tribes are not currently active in administration and enforcement issues for solid waste management, but they have the option of exercising solid waste management authority over tribal lands. In doing so, the Tribes need to abide by federal regulations and policies outlined in the Resource Conservation and Recovery Act (RCRA).

Jefferson County Solid Waste Advisory Committee (SWAC): The SWAC assists with solid waste administration and regulation by providing a means for public input and by serving in an important advisory capacity. Further details of the SWAC's role and membership can be found in Section 1.4 and Table 1.2.

Land Use Plans: The Jefferson County Comprehensive Land Use Plan, adopted August 28, 1998 and amended in 2004, provides guidance pertaining to land use issues and so can affect decisions such as siting solid waste facilities. Port Townsend has also adopted a Comprehensive Land Use Plan that addresses similar issues within City boundaries. Subsequent to the adoption of the County's land use plan, several ordinances were developed to provide a regulatory basis for the

plan. These ordinances include the zoning code, subdivision ordinance, shoreline master plan, and others, but only an interim zoning code has been adopted to date.

Solid waste is specifically addressed in the Jefferson County Comprehensive Land Use Plan in the chapters dealing with utilities and capital facilities. Relevant goals and policies from the County's land use plan are shown in Table 8.2. The City also addressed solid waste management in its land use plan, and the City's goal and policies are shown in Table 8.3.

8.2.2 Needs and Opportunities

The County faces the potential for financial constraints due to the reliance on tipping fees to fund recycling programs. Ultimately, should recycling become "too successful," funding for these programs would diminish due to shrinking waste quantities. Relying on the tipping fee for recycling funds is not the best long-term strategy.

Additional and long-term funding for the junk vehicle program and for abatements as well as cooperation between County departments is needed to have a successful program.

There are opportunities for regional efforts involving the neighboring counties of Clallam, Mason, Island and Kitsap. These opportunities are in disposal systems and other activities.

There is the possibility that additional areas of the County will be designated as an "urban growth area," or UGA (see also Section 2.3.1). These possibilities include an expansion of the City of Port Townsend UGA or the creation of a new UGAs in other areas. The creation of additional UGAs will have financial and service-related impacts, including possible changes in solid waste services.

8.2.3 Alternative Methods

The following options address the needs identified in the areas of enforcement, administration and funding. Solid waste districts are discussed separately below, as districts would affect both staffing and funding mechanisms at the same time.

Enforcement Options

Illegal dumping could be addressed through increased enforcement activities, systems that lead to universal garbage collection services, and education. Increased enforcement would require additional funding for enforcement personnel and activities. If needed, additional funding for enforcement activities may be available from Ecology grants or could be derived from grants, general funds, surcharges on tipping fees, special assessments, and/or increased permit fees, .

Implementation of universal garbage collection services could be achieved in several ways, but usually this is accomplished through some form of mandatory collection requirement. One of the more effective means of implementing mandatory garbage collection would be the formation of a collection district (see discussion of solid waste districts later in this section). Mandatory garbage collection was discussed during a series of public meetings held in 1997 and 1998, and proved to be very unpopular at that time.

Education is an important aspect of addressing illegal dumping and related problems. The Environmental Health Division is interested in providing education to residents about their

Table 8.2. Goals and Policies from the County's Comprehensive Plan.

Goal

UTG 7.0 Provide solid waste facilities and programs that are efficient, and which utilize recycling to the maximum extent practicable.

Policies

UTP 7.1 Implement, to the fullest extent possible, and in descending order of priority, solid waste management processes that reduce the waste stream, reuse waste materials, promote recycling, provide for the separation of waste prior to incineration or landfill disposal, and provide guidelines and strategies for disposal of all special waste types.

UTP 7.2 Initiate and support public educational outreach on solid waste management, including recycling opportunities, methods to reduce solid and chemical waste, and related environmental issues.

UTP 7.3 Identify and implement appropriate measures to ensure mitigation of adverse environmental impacts associated with solid waste collection activities.

UTP 7.4 Maintain the Solid Waste Advisory Committee involving citizens, waste management providers, regulatory agency representatives, the County, and other affected interests to identify methods for efficient and practical solid waste management, including small and moderate-risk waste handling strategies.

UTP 7.5 Provide appropriate levels of collection and recycling opportunities which will maximize public participation, and which offer the fullest practical and economical potential for waste materials.

UTP 7.6 If incentive programs fail to reach the waste reduction goals identified in the Capital Facilities Element, consider mandatory programs to the extent allowable by State law.

UTP 7.7 Identify and preserve for future use solid waste facility sites, including potential landfill sites, consistent with the Comprehensive Plan and the Solid Waste Management Plan.

UTP 7.8 Ensure reclamation of areas currently serving as solid waste disposal facilities to promote the recovery of such areas for future functional land uses

Action Items

1. Educate the public on solid waste management, including recycling opportunities, ways to reduce solid and chemical waste, and related environmental issues.
2. Utilize applicable grant funding for financial assistance for solid waste programs, such as public education on solid waste issues.
3. Develop strategies for achieving a reduction in Jefferson County's solid waste stream and where feasible, ensure the strategies include:
   - Improve the processing of recyclable materials, acceptable under appropriate regulations; in order to help alleviate the need to stockpile materials.
   - Providing opportunities for recycling to the public and commercial carriers at transfer locations.
   - Reducing the solid waste stream by encouraging manufacturers and retailers to reduce packaging waste at the retail level.
   - Encouraging procurement of recycled-content products.
4. Consider all practicable alternatives for the efficient management of the solid waste system.

From the Utilities Element Chapter of the 2004 Jefferson County Comprehensive Plan.

Table 8.3. Goals and Policies from the City's Comprehensive Plan.

Goal	
Goal #32	To manage solid waste in a responsible, environmentally sensitive and cost-effective manner.
Policies	
32.1	Follow the solid waste management hierarchy established in federal and state law, which sets waste reduction as the highest priority management option, followed by reuse, recycling and responsible disposal.
32.2	Promote the reduction and recycling of solid waste materials through differential collection rates, providing opportunities for convenient recycling, and by developing educational materials on recycling, composting and other waste reduction methods.
32.3	Seek to create a market for recycled products by maximizing the use of such products in the City's daily operations.
32.4	Contract with private haulers to maintain a cost-effective and responsive solid waste collection system.
32.5	Examine the feasibility of establishing a solid waste transfer station within Port Townsend in order to reduce costs to City residents.
32.6	Manage solid waste collection to minimize litter and neighborhood disruption.
32.7	Protect air, water, and land resources from pollution caused by the use, handling, storage and disposal of hazardous materials and substances.
32.7.1	Reduce City use of hazardous materials and safely manage, recycle, and dispose of toxic products used in City operations.
32.7.2	Continue to participate with Jefferson County in the implementation of Jefferson County's Solid Waste Management Plan.

From the Port Townsend Comprehensive Plan.

responsibilities for proper solid waste management and the options that exist for properly handling garbage. One aspect of this might be to clarify the costs of garbage collection, to dispel the idea that it is significantly more expensive than self-hauling waste to disposal sites. To the extent that people are encouraged to sign up for garbage collection services, this approach could help prevent the accumulation of large amounts of waste in the unincorporated areas of the County.

Administrative Options

Administrative options include maintaining the status quo, adding more staff, reducing the staff's workload, or changing the structure of the County's solid waste department.

Funding Options

One of the primary goals of this planning effort, sufficiently important to be considered a guiding principle, is that solid waste operations in Jefferson County shall be financially self-supporting.

Almost all revenue needed to achieve this goal is currently generated through tipping fees, but other options do exist. For example, expenses for capital improvements could be funded through internal financing, general obligation bonds, revenue bonds, industrial development bonds, grant funding, and/or private financing. Administration and enforcement expenses could be funded by assessments to collection systems, general funds, and private funding for private operations. Ecology has examined funding methods as part of the Beyond Waste project, and the options that they have identified are shown below (Ecology 2004b):

User Fees, Rates, Surcharges

1. Cost-of-Service-Based Rates: Cost-of-service-based rates, which allow for rates to cover the actual costs of providing the services, is a rate-setting methodology used by both the Washington Utilities and Transportation Commission (UTC) and some cities. Under Chapter 81.77 RCW, the UTC established cost-of-service-based rates for regulated solid waste collection from residents and commercial businesses in areas where certificates exist for solid waste collection companies. Under RCW 35.21.130 and 35.21.135, cities and towns may set rates through a solid waste or recyclable materials collection ordinance.

Both cities and counties can provide for reduced rates as incentives. Cities and towns may, and some do, provide reduced solid waste collection rates as incentives to residents participating in recycling programs. In UTC-regulated areas, counties can, by ordinance, provide for reduced solid waste collection rates as incentives to residents participating in recycling programs, subject to UTC approval.

2. Other Volume-Based Rates: This represents an alternative range of pricing options for solid waste collection and disposal services, such as using the rates to provide incentives for reducing wastes and incentives for separating recyclables. An example would be setting a rate where subscribers to two-can service would pay double the rate of one-can subscribers. Specific authority for counties to set such rates does not exist.

These types of rates may be problematic under cost-of-service models, as they are currently used to set rates that cover costs. Both cities and counties can provide for reduced rates as incentives. Cities and towns may, and some do, provide reduced solid waste collection rates as incentives to residents participating in recycling programs. In UTC-regulated areas, counties can, by ordinance, provide for reduced solid waste collection rates as incentives to residents participating in recycling programs, subject to UTC approval.

3. "Fixed" or "flat" Per-Customer Rates: Fixed or flat per-customer rates charge each customer the same amount regardless of the volume of service. Very simply, the total costs divided by the number of households equals the rate per household. Some cities use a flat rate for all or some services (garbage, recycling, and yard waste). The UTC uses flat rates for mandatory-pay recycling and yard waste services, but not garbage.

4. Solid Waste/Recycling Collection Rate Surcharges: As noted, Chapter 35.21 RCW provides authority to cities to set collection and disposal rates, which may include surcharges/fees to cover additional costs of managing the solid waste system beyond actual collection and disposal costs. Similarly, RCW 81.77.160 directs the UTC to establish collection rates that include "all known and measurable costs related to implementation of the approved county or city comprehensive solid waste management plan."

5. Planning Fees: RCW 36.58.045 authorizes counties to impose a fee on collection services throughout its unincorporated areas to pay for "the administration and planning expenses that may be incurred by the county in complying with the requirements in RCW 70.95.090."

6. Weight or Volume Based Disposal Fees: Both cities (RCW 35.21.120 and 35.21.152) and counties (RCW 36.58.040) are authorized to develop solid waste disposal sites and set user fees. Weight/volume based fees involve per-ton or per-cubic yard fees charged for disposal of solid waste at a transfer facility, landfill, or incinerator; these fees may also apply to moderate-risk waste drop-off, vactor waste separation and treatment, and other similar services. The basic premise is that the user pays for the service according to the amount of material disposed.

7. "Fixed" or "flat" Per-Customer Disposal Fees: Both cities (RCW 35.21.120 and 35.21.152) and counties (RCW 36.58.040) are authorized to develop solid waste disposal sites and set user fees. These fees may be set on a per-customer or per-trip basis instead of the more common weight or disposal basis.

8. Disposal Surcharges: Chapter 35.21 RCW provides authority to cities to set collection and disposal rates, and those rates may include surcharges to cover additional costs of managing the solid waste system over and above the costs calculated to cover actual collection and disposal. RCW 36.58.040 allows counties to set rates and charges for solid waste disposal, which includes the ability to impose disposal fee surcharges.

Taxes

9. Model Toxics Control Act Funds - Hazardous Substance Tax: Also referred to as a "pollution tax," this tax is established by Chapter 82.21 RCW and is imposed on persons who first possess, in Washington State, hazardous substances. The substances subject to this tax include those defined under federal law (CERCLA), registered pesticides, petroleum products, and any other substance that Ecology determines by rule to present a threat to human health or the environment if released into the environment. Revenues collected from this tax go into the Toxic Control Accounts (RCW 70.105D.070). Both a state toxics control account and a local toxics control account were established, and monies deposited into those accounts are to be used for a broad array of hazardous waste and solid waste activities and programs at the state and local government levels.

All counties are eligible to receive biennial Coordinated Prevention Grants (CPG), which come from the local toxics control account. The CPG funding is based in large part on population. Some portions of CPG monies go to local health authorities for inspection and enforcement activities. The other main use of the toxics control account monies is for Remedial Action Grants (RAG), given to local jurisdictions for cleanup activities, such as landfill closures. CPG grants require local matching dollars, which are typically paid for with disposal revenues.

10. State Litter Tax: The Waste Reduction, Recycling and Model Litter Control Account (WRRMLCA), imposed through Chapter 82.19 RCW, is funded by a tax collected from manufacturers, wholesalers, and retailers of items or packaging deemed to contribute to roadside litter. Chapter 70.93 RCW directs that the WRRMLCA be used for litter cleanup and prevention, and also for waste reduction and recycling efforts at both the state government and local community levels.

The litter tax that funds the WRRMLCA has not been amended or revised since its adoption in the early 1970s. The tax rate has not changed, nor has the list of items that are taxed, despite evidence that suggests the list of taxed items does not adequately reflect the types of items found on the roadside as litter or in illegal dumps. The Department of Revenue says the tax is difficult to administer and can be somewhat volatile. Since the need for cleanup and prevention programs will continue in the future, an examination of the litter tax and the overall WRRMLCA is warranted.

11. Disposal District Excise Tax: RCW 36.58.100-150 authorizes counties with populations of less than 1 million to create one or more disposal districts in unincorporated areas, which become junior taxing districts. Excise taxes may be levied upon citizens and businesses within a district (again, unincorporated areas only, unless city approval allows districts to expand into incorporated areas).

A disposal district is potentially in competition for taxing authority with other junior taxing districts, including ports, fire districts and utility districts. Three counties have instituted disposal districts: Lewis, Whatcom, and San Juan. Each situation is somewhat different from the others (see additional information in the next section of this chapter).

12. Mandatory Collection: Collection districts in unincorporated areas may be formed by counties under the authority of RCW 36.58A. Collection districts do not directly raise revenues, however. They can impose mandatory collection service at minimum levels for all unincorporated areas, which provides the structure for a service-area wide fee to be included in collection rates (see additional information on collection districts in the next section of this chapter).

13. Franchise Fees/Gross Receipt Taxes: Some cities charge franchise fees or taxes on gross receipts upon solid waste collection companies for the privilege of entering into a contract with or doing business within a city. These fees sometimes fund solid waste-related activities. The UTC assesses a regulatory fee on gross solid waste collection revenues of regulated solid waste collection companies.

Specialized Fees

14. Advance Recovery Fees (Voluntary or Mandatory): Advance recovery fees (ARFs) are a front-end financing method whereby some or all costs for end-of-life management of products are paid/collected when the product is sold. ARFs may be voluntary or mandated, visible or invisible. Invisible fees occur when manufacturers include the end-of-life collection, recycling, and disposal costs in the price of the product. This is called cost internalization, and examples include programs operated by the Rechargeable Battery Recycling Corporation (RBRC), Thermostat Recycling Corporation, Office Depot and Hewlett Packard.

ARFs can be used by manufacturers to pay for manufacturer-funded programs or can be used to pay for the costs incurred by other parties such as haulers, recyclers, or governments. Some forms of ARFs provide incentives to manufacturers to increase recyclability and reduce toxicity of their products, thereby reducing program costs of other entities.

15. Permitting Fees: Permits are required for legal solid waste management facilities. Fees for permitting activities are imposed and collected by jurisdictional health

departments. These monies are used for the health department's operating expenses (RCW 70.95.180; WAC 173-350-700 and 710).

Biosolid management system permit fees collected from entities engaged in the management of municipal sewage sludge are intended to cover the costs of the permit program. The monies are directed to the biosolids permit account and may be spent only after appropriation (RCW 70.95J.025; WAC 173-308-320).

In accordance with Chapter 90.48 RCW, anyone conducting a commercial or industrial operation that results in disposal of solid waste or liquid waste into the waters of the state (including municipal wastewater treatment plants) must pay a permit fee and obtain a state permit for the discharge. Wastewater discharge permit fees are deposited in the water quality permit account (Chapter 173-224 WAC).

Other

16. Enforcement Infractions/Fines/Penalties: Fees collected through enforcement actions taken against solid waste facilities are nearly always paid into a jurisdiction's general fund. However, they are not necessarily directed to help pay for the jurisdiction's enforcement or other solid waste management activities.

17. Sales of Recyclable Materials: Revenues from selling collected recyclable materials can be used to help pay for solid waste programs. Prices for recyclables fluctuate widely.

18. Fees/Charges for Recycling: Public and private recycling entities may charge fees to cover the costs of recovering or recycling a variety of discarded products.

19. Sales of Recovered Energy: Some solid waste facilities, such as waste-to-energy facilities and landfills, are able to recover energy from the waste materials. Some landfills create energy by burning landfill gas. Sales of this energy can be used to help pay for solid waste programs.

20. Government-Collected Funds from Private Sector Activities: In some instances, pursuant to RCW 81.77.020, cities contract with private parties to provide various solid waste collection services but retain the billing function. Revenues received above the amount remitted to the contractor can be directed to other solid-waste-related programs and activities by the applicable municipality.

21. General Fund Revenue Sources: Governments may use general fund revenues to pay for solid waste activities, and some do rely to some extent on such funding.

22. Bond Financing: RCW 36.67.010 authorizes counties to sell bonds to pay for major solid waste projects. Bonding is used for capital projects (landfills, transfer stations, etc.) or large landfill remediation efforts. It is not used for regular operating expenses. Bonds can be general obligation (G.O.) or revenue bonds. Typically, the debt service for a bond is paid with disposal fees.

23. Public Works Assistance Account: A statewide solid waste collection tax has been in place since 1989. Chapter 82.18 RCW imposes a 3.6% "solid waste collection tax" on all persons using such service. Revenues collected via this tax go into the Public Works Assistance Account, which is used to provide loans and financial guarantees to local

governments for public works projects, including solid waste and recycling infrastructure. This tax replaced an earlier "refuse collection tax," and that name continues to be applied to the new tax. These funds are to be used to make loans or give financial guarantees to local governments for public works projects.

Solid Waste Districts

Chapters 36.58 and 36.58A of the RCWs allow the establishment of waste disposal districts and waste collection districts, respectively, within a county. Either district can include the incorporated areas of a city or town only with the city's consent. A solid waste district (for collection or disposal) could centralize functions that are now handled by a variety of county and city agencies, but it may be difficult to develop a consensus on the formation and jurisdiction of either type of district. Either type of district may be able to alleviate illegal dumping and other problems through the institution of mandatory garbage collection (for a collection district only) and/or different financing structures.

RCW 36.58.040 prohibits counties from operating a solid waste collection system, but the establishment of a solid waste collection district that can act in a similar capacity is allowed by Ch. 36.58A RCW. A collection district can be created following the adoption of a solid waste management plan, however a collection district does not appear to possess taxing authority. According to RCW 36.58A.040, the revenue-generating authority of a collection district is limited.

A solid waste disposal district is a quasi-municipal corporation with taxing authority set up to provide and fund solid waste disposal services. A disposal district has the usual powers of a corporation for public purposes, but it does not have the power of eminent domain. The county legislative authority (i.e., the Board of County Commissioners) would be the governing body of the solid waste district.

RCW 36.58.130 allows the creation of a disposal district to provide for all aspects of solid waste disposal. This includes processing and converting waste into useful products, but specifically does not allow the collection of residential or commercial garbage. A disposal district may enter into contracts with private or public agencies for the operation of disposal facilities, and then levy taxes or issue bonds to cover the disposal costs. Thus, a disposal district established in Jefferson County could assess each resident or business (in incorporated areas only with the city's approval) a pro rata share of the cost of disposal at the Jefferson County Waste Management Facility. This could help to discourage illegal dumping by covering at least part of the disposal cost through mandatory payments, so that the additional expense for proper disposal would be lower than it is currently. In other words, the assessment by the disposal district would be paid regardless of where the resident or business dumped the waste or whether it was self-hauled or transported by a commercial hauler, and the latter two options would be less expensive by the amount of disposal costs already paid.

RCW 36.58.140 states that a disposal district "may levy and collect an excise tax on the privilege of living in or operating a business in the solid waste disposal taxing district, provided that any property which is producing commercial garbage shall be exempt if the owner is providing regular collection and disposal." The district has a powerful taxing authority, since it may attach a lien to each parcel of property in the district for delinquent taxes and penalties, and these liens are superior to all other liens and encumbrances except property taxes.

The funds obtained by a levy may be used "for all aspects of disposing of solid wastes...exclusively for district purposes" (RCW 36.58.130). Potential uses include:

- solid waste planning.
- cleanup of roadside litter and solid wastes illegally disposed of on unoccupied properties within the district.
- public information and education about waste reduction and recycling.
- defraying a portion of the present cost of disposal.
- subsidizing waste reduction/recycling activities.
- subsidizing the Moderate Risk Waste Facility and collection events.
- closure and post-closure costs for the old landfill and for other solid waste facilities.

Three counties have implemented disposal districts (Ecology 2004b):

1. In Lewis County, a disposal district is being used to provide a cohesive financial and control structure between the County and its principal cities to respond to the demands of a Superfund landfill site. The District does charges a tipping fee, but not an excise tax.
2. Whatcom County has implemented an excise tax on authorized waste collection services as allowed by state law. This effectively charges haulers $8.50 per ton, which haulers pass on to their customers and pay to the County regardless of where they take their waste.
3. San Juan County operates its own transfer station system and faced significant tonnage and revenue loss recently due to price competition. Hence, that county developed a disposal district to move some of its expenses to an excise tax, thus lowering its tipping fee and increasing revenues through increased waste tonnages.

In the late 1990s, Jefferson County, the City of Port Townsend and the Solid Waste Advisory Committee (SWAC) conducted a comprehensive public process to discuss the feasibility of a solid waste district and the Board of County Commissioners decided against taking this approach at that time.

8.2.4 Recommendations

The following recommendations are being made for regulation and administration (see also Recommendations WR4 and PE3):

RA1) Solid waste operations in Jefferson County shall be financially self-supporting, and the County and City should continue to pursue options for different fee structures that achieve this goal.

RA2) The County should continue to pursue and investigate all opportunities for regionalization of solid waste management programs.

RA3) Enforcement of City and County litter and solid waste ordinances should be given top priority.

8.2.5 Implementation Schedules and Costs

The recommendations shown above should be conducted on an ongoing basis, at no additional expense (i.e., using existing staff and funds that are already budgeted).

Recommendation RA1 has a very high priority for implementation, and is considered to be a "guiding principle" for Jefferson County's solid waste system. Recommendation RA3 has been given a high priority for implementation, and RA2 has a low priority (see Tables E.1 and E.3).

CHAPTER 9: SPECIAL WASTES

9.1 INTRODUCTION

The purpose of this chapter is to review the generation, handling and disposal methods for several special wastes in Jefferson County. These wastes generally require special handling and disposal either for regulatory requirements or for one or more other reasons, such as toxicity, quantity or other special handling problems. Most of these wastes are currently managed and disposed of separately from the solid waste disposal system, and many are not actually defined as solid waste.

The following special wastes are discussed in this chapter:

9.2 Agricultural Wastes
9.3 Animal Carcasses
9.4 Biomedical Wastes and Pharmaceuticals
9.5 Biosolids and Septage
9.6 Construction and Demolition Wastes
9.7 E-Waste
9.8 Grease
9.9 Land-Clearing Debris
9.10 Moderate Risk Wastes
9.11 Wood Wastes

The nature and source(s) for each special waste is described in this chapter, as well as the existing programs and facilities in Jefferson County for handling these wastes. All of the wastes are also examined for needs and opportunities, but only those that pose disposal problems are further examined for alternatives and recommendations. Currently seven wastes have been determined to present potential problems that warrant recommendations at this time: biomedical wastes, biosolids/septage, construction/demolition wastes, electronic wastes (e-wastes), grease, land clearing debris, and moderate risk wastes.

9.2 AGRICULTURAL WASTES

9.2.1 Existing Conditions for Agricultural Wastes

Agricultural wastes result from farming and ranching activities, and consist of crop residues and manure. Other wastes generated on farms, such as regular household trash or moderate risk wastes (pesticides and other chemicals), are included in the other sections of this Solid Waste Management Plan (SWMP). Most of the farms in Jefferson County are located on the east side, primarily in the Chimacum and Beaver Valley areas, where favorable climate and land characteristics exist.

The amount of agricultural waste generated in Jefferson County was estimated from the data on the County's crop acreage and number of livestock using typical waste generation rates. As shown in Table 9.1, the amount of agricultural wastes is significant. Current practices, however, do not result in substantial quantities of agricultural waste that require disposal off the farms. Most wastes are incorporated into the soil to enhance fertility or handled on-site in other ways. A small amount of spoiled hay is brought to the Port Townsend Biosolids Compost Facility, as well as minor amounts of orchard prunings and incidental amounts of other organic materials.

Table 9.1. Estimated Quantity of Agricultural Wastes in Jefferson County.

Crop or Livestock	Annual Waste Generation Factor[1]		Number of Units[2]		Annual Tonnages
Hay and Pasture	1.5	tons/acre	3,132	acres	4,700
Orchards	2.25	tons/acre	51	acres	115
Vegetables	3.0	tons/acre	28	acres	84
Beef Cows	11.3	tons/head	808	head	9,130
Dairy Cows (mature)	14.6	tons/head	840	head	12,260
Other Cattle	11.0	tons/head[3]	3,306	head	36,400
Sheep	0.7	tons/head	442	head	310
Chickens	42.0	tons/1,000 birds	854	birds	36
	Total Annual Waste Amount				**63,000 tons/year**

Notes:
1. Waste generation factors for crops are from "Solid Waste Generation Factors in California" (CSWMB 1974), and the generation factors for livestock is from "Agricultural Waste Issue Paper" (KC 1998).
2. Number of units is from the 2002 Census of Agriculture (USDA 2007).
3. Generation rate for "other cattle" varies from 6.4 tons per year for immature cattle to 15.5 tons per year for replacement heifers. Figure shown here is a mid-range value.

An unknown amount of nursery and greenhouse waste is also generated in Jefferson County, but data is not available on acreage devoted to this activity or on a typical waste generation rate for this type of crop.

9.2.2 Needs and Opportunities for Agricultural Wastes

A major concern for manure handling and application is the potential contamination of nearby surface waters. There is a growing concern throughout Washington State over the impacts posed by agricultural waste to water quality and salmon habitat. The awareness of this issue has been raised by the listing of several salmon runs as endangered species in March 1999, thus triggering a broad range of remedial activities for farms and urban areas.

To address concerns about water quality impacts, many farms and ranches in Jefferson County have implemented "best management practices" to prevent pollutants from entering surface waters. These practices often involve the use of low-technology approaches such as installing fences to keep livestock away from waterways, rotating use of pastures, and terracing. There are still minor problems at some of the small operations ("hobby farms"), but the Jefferson County Conservation District and others are continuing to educate livestock owners about best management practices. This is a voluntary program, but it is generally felt that it is continuing to make advances.

Since there are no significant problems with agricultural wastes in Jefferson County, no analysis of alternatives or recommendations is presented at this time.

9.3 ANIMAL CARCASSES

9.3.1 Existing Conditions for Animal Carcasses

The primary generators of animal carcasses in Jefferson County include:

- Animal Shelter: The animal shelter, located on the property of the Jefferson County Waste Management Facility, is using a crematorium that was installed in 1999 to handle the animal carcasses that are generated there or brought to them. The shelter is generally only used for smaller animals.
- Roadkill: Dead animals collected from the roadside on the east end of the County by police officers are brought to the animal shelter for disposal.
- Veterinary Offices: Local veterinarians generally use a crematorium (one uses the animal shelter's services but many use Petland in Aberdeen), allow owners to take the pets home or use a rendering service (for larger animals only). Pet owners that take the deceased animals home either then bury them on their own property or take them to the crematorium. One veterinarian takes some animals to his own property for burial.
- Farms: Dairy cows and other animals are usually "retired" when they become non-productive or at a certain age, and are slaughtered for their meat at that time. The animals that die from accidents or disease are handled by rendering companies, taken to or hauled away by the Olympic Game Farm, or buried on the farm.

9.3.2 Needs and Opportunities for Animal Carcasses

Current methods used for disposal of animal carcasses in Jefferson County are adequate and no additional options need to be addressed at this time. This situation could change, however, should an animal epidemic occur (such as the discovery of a herd being infected with mad cow disease or a bird flu problem).

Should an animal epidemic occur in Jefferson County, the solid waste system may be called upon to assist with the disposal of large amounts of animal carcasses and possibly also infected bedding, manure and other materials. The final authority for determining disposal options will rest with local, state and federal emergency response agencies, but the solid waste system may need to address questions about services that can be provided while protecting worker safety. Any involvement by the solid waste system will need to be determined on a case-by-case basis if this type of problem should occur in the future, but solid waste representatives should be consulted at an early stage in emergency planning if there is any expectation of using the solid waste system for disposal of infected animals.

9.4 BIOMEDICAL WASTES AND PHARMACEUTICALS

9.4.1 Existing Conditions for Biomedical Wastes and Pharmaceuticals

State law (RCW 70.95K) defines biomedical wastes to include:

- Animal waste: animal carcasses, body parts and bedding of animals that are known to be infected with, or have been inoculated with, pathogenic microorganisms infectious to humans.

- Biosafety level 4 disease waste: contaminated with blood, excretions, exudates, or secretions from humans or animals who are isolated to protect others from highly communicable infectious disease that are identified as pathogenic organisms assigned to biosafety level 4 by the Center for Disease Control (CDC).
- Cultures and stocks: wastes infectious to humans, including specimen cultures, cultures and stocks of etiologic agents, wastes from production of biologicals and serums, discarded live and attenuated vaccines, and laboratory waste that has come into contact with cultures and stocks of etiologic agents or blood specimens. Such waste includes, but is not limited to, culture dishes, blood specimen tubes, and devices used to transfer, inoculate and mix cultures.
- Human blood and blood products: discarded waste human blood and blood components, and materials containing free flowing blood and blood products.
- Pathological waste: human source biopsy materials, tissues, and anatomical parts that emanate from surgery, obstetrical procedures and autopsy. Does not include teeth, human corpses, remains and anatomical parts that are intended for internment or cremation.
- Sharps: all hypodermic needles, syringes with needles attached, IV tubing with needles attached, scalpel blades, and lancets that have been removed from the original sterile package.

These wastes require special handling and disposal practices to protect the health and safety of both medical and solid waste disposal personnel. Medical facilities have the responsibility to determine which medical wastes are considered biomedical, and then arrange for the proper handling and disposal of these wastes. All syringes and other "sharps", plus wastes that have had contact with blood and certain other bodily fluids, are generally classified as biomedical wastes. These wastes are placed in special bags or rigid plastic containers, and then removed by licensed biomedical waste collectors. Body parts are also classified as biomedical wastes.

The Washington State Utilities and Transportation Commission (UTC) regulates transporters of infectious wastes. Their regulations also allow regular solid waste haulers to refuse to haul wastes that they observe to contain infectious wastes as defined by UTC.

Biomedical waste is generated in Jefferson County by Jefferson Health Care, the South County Medical Clinic and Jefferson County Public Health. These facilities use the services of a licensed biomedical waste hauler to transport and dispose of this waste. Body parts are handled by the same hauler, although are packaged separately, labeled as "pathological," kept frozen until shipment, and are incinerated without any additional handling at the hauler's facility. Other biomedical waste generators in the County include doctor's offices, dental clinics, veterinary offices and fire departments, which are generally also using a licensed biomedical waste hauler or, in the case of veterinarians, a collection service offered by Petland. Petland collects animal carcasses and syringes for proper disposal. One veterinarian, however, admitted to placing used syringes in the regular garbage.

Other sources of biomedical wastes are home health care and senior care facilities. In the more serious cases, biomedical wastes from these sources are typically generated under a nurse's supervision and are brought back to the primary hospital or other facility that employs the nurse. In other cases, however, the medical wastes from home use may not be disposed of properly. Sharps, likely from residential sources, have been found illegally dumped in the woods, improperly disposed of with solid waste, and mixed with recyclable materials.

Public Health provides a needle exchange program and provides special containers for collecting sharps. Sharps are considered acceptable at the Jefferson County Waste Management Facility as

long as these are contained within a PET soda bottle or other approved container, but are not acceptable when placed in another container or no container at all.

Evidence has been accumulating in the past few years that current disposal methods for pharmaceuticals are creating problems. Leftover amounts of medicines and drugs are often flushed into the wastewater system, and have consequently been found in streams and lakes in quantities that are having undesirable effects on aquatic species. The alternative, tossing these drugs into the garbage, raises concerns about accidental exposure or illegal use of these drugs. Many of the drugs of concern are regulated substances with legal ramifications for ownership and handling, which complicates efforts to find a better disposal method. Some pharmaceuticals are also classified as hazardous waste under state and federal regulations, which leads to a potential financial burden for those companies that might otherwise be willing to collect surplus and outdated drugs.

9.4.2 Needs and Opportunities for Biomedical Wastes and Pharmaceuticals

The disposal of residential sharps is an area where improvements are needed, as these wastes are sometimes improperly disposed.

Better disposal methods for pharmaceuticals are also needed.

9.4.3 Alternatives for Biomedical Wastes and Pharmaceuticals

Improved disposal practices for residential sharps could be accomplished through:

- education programs could be conducted to promote safe handling and disposal of sharps.
- the sharps collection program could be maintained or expanded.
- increased enforcement activities and larger penalties could be implemented (although in most cases, the source for the sharps cannot easily be determined).

The Jefferson County Public Works Department is working with the hospital and others to arrange a collection program using drop-off points strategically located throughout the county. This program is expected to be jointly managed and financed by the parties involved.

Improved disposal practices for pharmaceuticals will likely require new handling systems and other solutions that are best addressed on a statewide or national basis. The Department of Ecology has taken a few initial steps to address pharmaceutical wastes, for instance by excluding drugs (those drugs that are not classified as hazardous waste by federal regulations) from state dangerous waste disposal requirements so that the drugs can be more easily disposed through incineration by medical facilities and police forces.

The Washington Citizens for Resource Conservation (WCRC) has also been addressing this issue, including sponsoring a survey of King County residents to find out more about current disposal practices. That survey (WCRC 2006) found that slightly more than half (52%) of the respondents typically disposes of unwanted medicines in the garbage and 20% flush them down a toilet or sink. Three-quarters of the respondents expressed a willingness to properly dispose of medicines if a convenient option were available, and 84% stated that their local pharmacy would be the most convenient location.

Potential alternatives for pharmaceuticals include:

- a "take-back" or product stewardship program could be started.
- education programs could be conducted to promote safe handling and proper disposal.
- other programs might be instituted at the state or federal level in the next few years, and Jefferson County could participate in those programs.

9.4.4 Recommendations for Biomedical Wastes and Pharmaceuticals

The following recommendations are made for biomedical wastes:

S1) Increased education efforts will be conducted by Jefferson County Public Health to target residential medical waste and encourage proper disposal of it (see also PE8).

S2) Public Works will continue to pursue and cooperatively manage a collection program for residential sharps.

S3) Public Works and Public Health will participate in statewide or other programs for pharmaceutical wastes.

These recommendations will be implemented as soon as possible and then will be conducted on an ongoing basis. If a local option for pharmaceuticals can be developed in the meantime, however, Public Works and Public Health will implement that program. Recommendations S1 and S2 have been given a high priority for implementation (see Table E.1). Recommendation S3 has been given a low priority because the implementation of this recommendation is contingent on others (see also Table E.3).

9.5 BIOSOLIDS (SEWAGE SLUDGE AND SEPTAGE)

9.5.1 Existing Conditions for Biosolids

Sewage sludge that has been treated to meet standards for beneficial use (such as land application) is called "biosolids." This type of material is specifically excluded from the definition of solid waste, although other wastes from the wastewater treatment process (such as grit, screenings, sludge and ash) are still classified as a solid waste. Biosolids are defined by Chapter 173-308-080 WAC as municipal sewage sludge that is a primarily organic, semisolid product resulting from the wastewater treatment process, that can be beneficially recycled and meets all applicable requirements under this chapter. Biosolids includes septic tank sludge, also known as septage, that can be beneficially recycled and meets all applicable requirements. Biosolids are further categorized by federal regulations into Class A and Class B based on pathogen reduction measures and metals contamination levels. The federal regulations (40 CFR Part 503) are self-implementing, which means that the requirements must be met regardless of the permit status of a facility.

The largest source of biosolids in Jefferson County is the Port Townsend Wastewater Treatment Plant (WWTP). Biosolids from this facility are being composted with yard debris at the Port Townsend Biosolids Compost Facility, located at the Jefferson County Waste Management Facility. The Compost Facility has been operating since December 1993.

Septage is also accepted at the Compost Facility. The septage handling system includes a receiving area and a dewatering unit. The septage receiving area consists of a manhole, screening vault, and two holding tanks, each with a holding capacity of about 9,000 gallons. Septage is delivered by septage haulers who dump it into the receiving station. The volume of septage delivered by each hauler is determined by floating level indicators in the holding tanks. Two positive displacement blowers supply air to the septage holding tanks for mixing and to keep the septage aerobic. A centrifugal fan pulls odorous air from the holding tanks to a biofilter for treatment.

The Port Townsend Biosolids Compost Facility utilizes an aerated static pile process to compost dewatered biosolids from the City's wastewater treatment plant, septage (which is dewatered first) and yard debris. Liquids from the process, including septage filtrate, contaminated storm water runoff, and condensate from the compost aeration system, are treated in a batch reactor and constructed wetlands, and then discharged to infiltration basins for additional treatment and ultimate disposal. Storm water from other paved areas of the facility is treated in the constructed wetlands and discharged to the infiltration basins for additional treatment and ultimate disposal.

The composting operation consists of several steps, including grinding of woody yard debris, mixing, active composting, curing and screening. The active composting area consists of an asphalt pad that is covered by a pole building with fourteen aeration fans. The compost mixer is also located in the active composting area and is first loaded with dewatered biosolids and septage and then yard debris. The ingredients are measured by a scale on the compost mixer or by the number of front-end loader buckets. Once all the ingredients have been added the compost mixer is started, run for five minutes, and then the load is discharged and ready for active composting.

The mixture is placed in long narrow piles on top of an air plenum made of perforated pipe and oversized material from screening previous batches of finished compost. Each compost pile is aerated by a centrifugal fan that draws air through the compost pile (vacuum mode) and discharges the air to a biofilter for odor removal. The compost pile is aerated in the vacuum mode until the Class A pathogen reduction and vector attraction reduction temperature requirements have been met. When the compost is ready to be screened, after either active composting or compost curing, the compost screen is started and compost is loaded into the hopper of the compost screen with a front-end loader. On a volume basis, the final compost mixture consists of one part dewatered biosolids or septage, two parts ground yard waste, and one part recycled oversized compost.

The capacity of the plant depends somewhat on the mixture of raw materials and operating procedures, but has been estimated to be 130,000 pounds per month of biosolids (on a dry weight basis), 87,000 gallons per month of septage, 1,200 cubic yards per month of yard debris, and 600 cubic yards per month of recycled (oversized) material from screening (CH2MH 1996).

Prior to distributing the finished compost, it is sampled and tested to confirm that it meets the Class A pathogen reduction standards for salmonella densities. After curing for three to six months, salmonella densities are typically less than 5 salmonella per gram of compost, well below the Class A requirement of one MPN per four grams. In addition to monitoring the composting process for pathogen and vector attraction reduction requirements, the finished compost is also tested for nutrients, metals, organochlorine pesticides, chlorinated herbicides, and PCBs.

The finished compost is sold to the general public and a few large users. There is adequate demand for the finished product during most of the year, although seasonal surpluses do occur. These surpluses have been absorbed by large-volume applications.

There are several other sources or programs for biosolids in Jefferson County, including:

- Port Ludlow wastewater treatment plant, which is currently employing land application (tree farms, or silviculture) to dispose of biosolids.
- Olympic Corrections Center currently operates a co-composting system that handles their biosolids and food waste. Wood chips are used as a bulking agent, and the mixture of biosolids, food waste and wood chips is composted on a covered concrete pad for 30 days, cured for 60 days, screened and then used on the lawns at the institution.
- Olympic National Park in Kalaloch operates a small wastewater treatment system where sewage lagoons are used for settling and storage. No biosolids have been generated from this source recently.
- Port Townsend Paper Company has a separate sanitary wastewater treatment system. The biosolids from this system are taken to the Port Townsend Biosolids Compost Facility, processed using the septage dewatering system, and the resulting sludge is composted.
- land application sites (silviculture) are permitted in Jefferson County for wastewater plants located in Bainbridge Island.

Table 9.2 shows data on the amounts of biosolids generated or deposited in Jefferson County.

Table 9.2. Biosolids Quantities in Jefferson County (2006).

Facility or Source	Dry Tons, per year
Port Townsend WWTP	247
Bainbridge Island Land Applications	86
Port Ludlow Land Applications	48
Total Annual Amount	**381 tons**

Note: Data is for 2006 and was provided by Jefferson County Public Health and the City of Port Townsend.

Land applications are regulated and permitted by the Department of Ecology, and Public Health issues a permit for the compost facility.

9.5.2 Needs and Opportunities for Biosolids

In general, biosolids in Jefferson County are handled through beneficial use programs and do not significantly impact solid waste systems. The Port Townsend Biosolids Compost Facility has adequate capacity to handle septage generated in Jefferson County. This facility is permitted to accept septage from out-of-county sources if capacity is available. Septage has occasionally been refused because of excessive volumes, and is also rejected if it contains substantial amounts of grease (see also the discussion of grease in Section 9.7).

An attempt to institute a higher fee for septage at the Biosolids Compost Facility in 2006 resulted in more septage being taken to out-of-county facilities, but adjustments already made to the fee will hopefully achieve a better balance of deliveries to the facility.

The state biosolids rules, Chapter 173-308-080 WAC, was recently updated. The new provisions in this rule include:

- streamline the permitting process,
- improve septage management requirements,
- develop a more thorough and equitable fee structure, and
- provide minor clarifications and take care of other "general housekeeping" issues.

9.5.3 Alternatives for Biosolids

Current methods of handling septage are probably the best option for handling increased quantities in the future, although biosolids and septage are under the authority of wastewater treatment programs and only need to be addressed here to the extent that these being are co-managed with solid wastes (i.e., composted with yard debris at the Compost Facility). Options include using other facilities for septage disposal, rejecting out-of-county septage, increasing the capacity of the Compost Facility, land-applying septage, and sending the liquid portion of septage to the City's wastewater treatment plant. The acceptance of out-of-county septage by the Port Townsend Biosolids Compost Facility is a good example of a regional solution to a waste disposal problem, and is an activity that financially benefits the Compost Facility since the septage is accepted for a fee. Land-applying septage is permitted under current State and Federal regulations, although not without meeting requirements for screening, covering (injecting or burying), and lime treatment. The large amount of forest lands in the County could facilitate increased beneficial use of treated septage.

9.5.4 Recommendations for Biosolids

The following recommendation is made for septage wastes (see also Recommendation C1):

S4) The City of Port Townsend and Jefferson County, with assistance from the SWAC, will continue to contribute to the discussion of septage disposal issues and problems.

This recommendation has been given a medium priority for implementation (see Table E.2).

9.6 CONSTRUCTION AND DEMOLITION (C&D) WASTES

9.6.1 Existing Conditions for C&D Wastes

Construction and demolition (C&D) wastes consist primarily of new and used building materials such as wood, sheetrock, pipe and other metals, shingles, concrete, and asphalt.

A category closely related to C&D is "inert wastes". Inert wastes include concrete, asphalt, glass, ceramics and other materials that meet the criteria shown in Ch. 173-350-990 WAC. The regulatory status of inert wastes was recently changed to allow these materials to be disposed with less permitting required.

The total amount of C&D waste generated in Jefferson County is unknown, but most communities generate C&D in quantities equal to half or more of the regular solid waste stream. C&D wastes are generated at a rate proportional to construction activity in the County, and so annual amounts will vary depending on population growth, the economic climate and other factors. Large commercial and other one-time projects have a significant impact on annual amounts. The level of construction activity in the County has increased in the past few years (see Table 9.3).

Table 9.3. History of Construction Activity in Jefferson County.

	Building Permits,	New Residential Construction Only[1]	
Year	Total Annual Value	Annual Value	No. of Homes
1998	$43,512,176	$26,257,877	197
1999	$39,076,034	$22,768,555	178
2000	$38,864,177	$24,891,020	192
2001	$32,458,573	$23,563,766	180
2002	$39,365,844	$28,286,799	175
2003	$46,599,352	$31,826,477	185
2004	$64,699,847	$51,538,309	251
2005	$67,498,183	$53,105,388	255
2006	$62,690,081	$48,685,260	215

Notes: Figures are from the Jefferson County Department of Community Development (JC 2007) and do not include city-issued permits.

1. Data is only for construction of new homes (single-family homes and duplexes), and does not include remodeling projects, additions, or commercial construction.

Construction and demolition waste is handled in a variety of ways. Some of this waste is reused or recycled, some of it is handled on-site at the construction site, and a portion of it is brought to the Jefferson County Waste Management Facility for disposal through waste export. Reuse activities include a retail store in Port Townsend, diversion of material from the tipping floor of the Transfer Station by County staff (the general public is not allowed to salvage materials from the tipping floor), and private efforts by construction companies and others. Material handled on-site is sometimes burned or buried, although these are not approved practices. In some cases, however, wood scraps are legitimately being diverted for use as firewood.

The inert landfill on Indian Island is the only disposal facility specifically permitted in the County to handle C&D, and this is only for wastes generated on-site by Naval activities.

9.6.2 Needs and Opportunities for C&D Wastes

There are three needs and opportunities associated with C&D waste:

- recycling opportunities are lacking for several of the large-volume materials in the C&D waste stream, specifically clean (untreated) wood waste and possibly sheetrock (at least a portion of the sheetrock might be currently recycled through take-back programs of sheetrock suppliers).

- more C&D waste could be handled by existing reuse and recycling opportunities.
- education of the industry to work towards more sustainable practices.

9.6.3 Alternatives for C&D Wastes

The existing alternatives for this waste stream include deliveries to disposal facilities, disposal on-site at the point of generation, recycling, and waste exchanges. Composting clean wood waste is also an option, but this has been examined by the City and it was concluded that separation and monitoring requirements would be excessive. Other options include education and promotion of recycling and reuse, and a regional landfill for C&D wastes.

Recycling construction and demolition wastes often requires a significant investment in special facilities and equipment that are dedicated to a specific type of material (such is typically the case with wood waste, concrete and sheetrock) and the waste quantities in Jefferson County probably do not warrant such an investment. However, there are specific materials that could be diverted to existing recovery operations in greater quantities, such as cardboard and metals.

Another option is a wood collection site that would convert the wood to hog fuel through grinding. Any construction debris diverted to this application would need to meet certain criteria, including the requirement to be free of potentially toxic contaminants (asbestos, lead, preservatives, etc.). This approach would not be considered recycling, but might provide a less expensive and more productive alternative than waste export. The market for hog fuel is currently good due to high oil prices, but the value of hog fuel can be expected to fluctuate in the future. Separate collection of clean wood waste is working very well in Island County and the material is currently shipped to Kimberly-Clark in Everett for use as hog fuel.

A regional landfill for C&D waste might reduce the expense of disposal for this waste stream, although less-expensive disposal options could also become a barrier to recycling or other uses.

Green Building

Increased education about existing opportunities is being spearheaded by the Green Building Council, Ecology and others. Increasing the amount of green building practices is one of the five key initiatives of Ecology's new statewide solid waste management plan (the "Beyond Waste" plan).

The amount of C&D wastes that are recycled and reused could be increased by more education and promotion of existing opportunities for recycling and reuse. This education could target builders and architects, as well as private parties responsible for large commercial remodeling or construction projects. A primary strategy would be to get these people to plan ahead for recycling and reuse. Information or other assistance is available from the Green Building Council and others to help with these efforts.

9.6.4 Recommendations for C&D Wastes

The following recommendations are made for C&D wastes:

S5) Existing opportunities for reuse (through reuse stores) and recycling of construction and demolition wastes will be promoted to homeowners and building professionals by the County as part of the public education efforts conducted for waste reduction and recycling.

S6) County staff and SWAC will participate in future discussions to evaluate the feasibility of a regional C&D landfill.

S7) Jefferson County staff will explore the feasibility of including a waste exchange in the design for the new transfer station.

The first two recommendations are meant to be conducted on an ongoing basis by existing staff. Recommendation S7 will need to be conducted on the same timeline as the design project for the new facility. Recommendation S5 has been given a high priority for implementation, S6 is a low priority and Recommendation S7 is a medium priority (see Tables E.1, E.2 and E.3).

9.7 E-WASTE

9.7.1 Existing Conditions for E-Waste

Electronic waste, or "e-waste," has been a growing concern for the past several years. Old computer, televisions and other products with circuit boards contain a variety of heavy metals. A typical computer monitor, for instance, contains four to eight pounds of lead in the glass. Circuit boards contain cadmium, lead, and mercury. Other parts of these products may contain chromium, barium and brominated flame retardants.

Special collections for e-waste have periodically been conducted in Jefferson County, the most recent one in Port Ludlow on October 24, 2006. The County's recycling contractor (Skookum Recycling) also accepts electronics on an ongoing basis for a fee at the Recycling Center. Products that are handled through this program include televisions, vcr's, computers (monitors, base units and peripherals), and other consumer electronics.

9.7.2 Needs and Opportunities for E-Waste

On March 24, 2006, in response to these concerns, Governor Gregoire signed a law that requires the establishment of a system to recycle electronic wastes, including computers, monitors and televisions. This system will be available at no charge to consumers, and will be financed by manufacturers of the electronic equipment. Rules are still being worked out to implement this law. The new system will be effective as of January 1, 2009.

At a minimum, County staff will monitor the progress made towards implementing this new requirement and consider options on how local programs could be integrated with the new system.

9.7.3 Alternatives for E-Waste

The primary long-term alternative for proper e-waste disposal will be the state-mandated system that will become effective in 2009. Before that, additional special collections could be conducted.

9.7.4 Recommendations for E-Waste

The following recommendation is made for e-waste:

S8) The County will participate in the state-mandated program anticipated to go into effect January 1, 2009.

Contingent on the final details that have yet to be determined for the statewide program, Jefferson County will participate to the extent possible, or at least help promote and publicize (through the efforts of the Waste Prevention Coordinator) future opportunities for the proper disposal of e-waste. This recommendation has been given a high priority (see Table E.1).

9.8 GREASE

9.8.1 Existing Conditions for Grease

Grease is generated primarily by restaurants, cafeterias and other food services. It is not easily handled by the solid waste system because it is semi-liquid and very messy. It also should not be put into sewer or septage systems because it causes serious problems there. Historically, a separate collection system has been available for handling grease, through the collection efforts of rendering companies. Recently additional competition for the grease has arisen due to its value for conversion to biofuels, and at least two individuals in Port Townsend are now taking grease from restaurants for this purpose.

To be recycled or converted to biofuel, grease must be collected separately from other wastes. This is typically accomplished by 55-gallon drums, which are removed and replaced when full, or larger containers, which are pumped out as needed. If taken by a rendering company, the grease may be processed to remove contaminants and used to make an animal feed supplement, or may be sold to a biofuel company. Grease that is mixed with septage cannot be recycled, and septage with a visible amount of grease in it cannot be accepted by the Port Townsend Biosolids Compost Facility. Grease removed from interceptors, if it has come into contact with wastewater containing human wastes, cannot be recycled. Non-recyclable grease and grease-contaminated septage must be disposed of at wastewater treatment plants in other counties.

9.8.2 Needs and Opportunities for Grease

The value of grease has recently increased due to its use in biofuel production.

9.8.3 Alternatives for Grease

Few alternatives exist for handling grease outside of the existing services discussed above. There are a variety of options for assisting with providing these services, such as establishing a franchise to make the services more cost-effective or providing a financial subsidy through contracts and other means, but this level of involvement with the existing private efforts would be difficult to justify.

Through public education activities and possibly enforcement, restaurants and other food services could be encouraged to handle grease in an appropriate manner. This will be important in the short term, as adjustments are made to the current implementation of fees for grease collection services.

9.8.4 Recommendations for Grease

The following recommendations are made for grease:

S9) Restaurant inspectors from Jefferson County Public Health will educate restaurant owners and employees about proper handling and disposal practices for grease, and encourage recycling of this material where appropriate.

S10) The County will consider methods to encourage conversion of grease (and other waste materials) to biofuel.

These recommendations will be conducted on an ongoing basis. The City will partner with Public Health to identify those businesses that are creating a problem through improper grease disposal. Recommendation S10 will include examining the feasibility of incorporating or hosting collection opportunities and/or processing systems at the Jefferson County Waste Management Facility. Recommendation S9 has been given a high priority and Recommendation S10 has a medium priority for implementation (see Tables E.1 and E.2)

9.9 LAND-CLEARING DEBRIS

9.9.1 Existing Conditions for Land-Clearing Debris

Land-clearing debris consists primarily of natural woods (such as stumps and brush) and soil. To the extent these materials are removed from the work site, these are taken to the Compost Facility or other sites.

9.9.2 Needs and Opportunities for Land-Clearing Debris

The total amount of land-clearing debris generated in Jefferson County is unknown, but increasing amounts of this material have been brought to the Biosolids Compost Facility. The facility is now receiving more material than it actually needs for use as a bulking agent (see Chapter 5 for more details). It would be a more sustainable practice if this material were left on the site. The lack of a tipping fee for this material at the Biosolids Compost Facility may be acting as a disincentive for this and other alternatives for the land-clearing debris.

9.9.3 Alternatives for Land-Clearing Debris

The alternatives for this material include the deliveries to disposal facilities, on-site management at the point of generation, and composting and related methods at other sites.

9.9.4 Recommendations for Land-Clearing Debris

The following recommendations are made for land-clearing debris:

S11) A tipping fee will be instituted at the Jefferson County Waste Management Facility/Biosolids Compost Facility for land-clearing debris.

S12) On-site management of land-clearing debris will be strongly encouraged.

Recommendation S11 will be implemented in 2007, and Recommendation S12 will begin prior to the effective date of any new tipping fees. For Recommendation S12, the City and County will provide information about alternatives, encourage on-site grinding (for storm water management and other purposes), and encourage waste reduction practices (i.e., avoiding the removal of vegetation unless necessary). Recommendations S11 and S12 have both been given a high priority for implementation (see Table E.1).

9.10 MODERATE RISK WASTES

9.10.1 Existing Conditions for Moderate Risk Wastes

Industries, farming operations, businesses, and homes throughout Jefferson County produce small amounts of hazardous wastes. For most of these, the amount of any waste produced falls below regulated quantities and so is classified as a "moderate risk waste" (MRW). Moderate risk waste includes household hazardous wastes (wastes produced by residential activities that would be hazardous waste except by definition they are exempt from regulation) and wastes from small-quantity generators (businesses that produce less than 220 pounds of dangerous waste or 2.2 pounds of extremely dangerous waste per month, and that do not accumulate these wastes in excess of 2,200 or 2.2 pounds, respectively). The latter is also defined by the U.S. Environmental Protection Agency as a "conditionally-exempt small quantity generator" (CESQG) on the premise that improper handling or disposal of such wastes would cause the CESQG to fall under the full body of hazardous waste regulations.

Moderate risk wastes that are generated in Jefferson County can be brought to the Moderate Risk Waste (MRW) Facility in Port Townsend. Hazardous wastes are not accepted at the Jefferson County Waste Management Facility, although separate drop-off containers are there for car batteries, motor oil and antifreeze. Separate collections have also been conducted in other parts of the County, including regional events conducted with Clallam County. The most recent special collection event was held in Quilcene.

The MRW Facility has operated since 1995. The County and the Port of Port Townsend jointly developed this facility with partial funding from the Washington State Department of Ecology (Ecology). In September 1997, the County assumed sole ownership of the facility by reimbursing the Port for its portion of the initial construction costs. The MRW Facility is open two days per week for six hours each day and is staffed by Jefferson County Public Works Solid Waste employees. Hazardous waste from residential sources is accepted free, while business waste (CESQGs) and non-county residential waste is accepted for a fee. A variety of wastes are handled by this facility, including automotive products, oil-based paint and paint-related materials, lawn and garden chemicals, cleaners and many miscellaneous wastes. In 2006, a total of 129 drums of wastes were packed for shipment to hazardous waste processing and disposal facilities or recycling facilities (43% of the drums were shipped to recyclers). Wastes that are received in a reusable condition by this facility are made available for other patrons to take.

Ongoing funding for the MRW Facility is provided through a portion of the tipping fee (from the Jefferson County Waste Management Facility), and Ecology Coordinated Prevention Grant (CPG) funds. Fees charged to some users (CESQGs and out-of-county customers) pay for the disposal costs for those wastes.

One-day collection events are held annually at Quilcene to provide convenient opportunities for south County residents to properly dispose of MRW wastes. The most recent collection event was held October 14, 2006, and participating households came from Quilcene (52%) and Brinnon (48%). Materials collected included 87.7 gallons of oil-based paint, 23.8 gallons of oil, 1,368 pounds of car batteries and various other hazardous wastes.

Public education and information about the MRW Facility and hazardous wastes in general is done through the Waste Prevention Education Coordinator. Others in the County, including the garbage haulers, recycling companies, County solid waste and Public Health staff also provide information on proper handling and disposal of moderate risk wastes. A video produced by Public Health was recently aired on a local television channel PTTV.

9.10.2 Needs and Opportunities for Moderate Risk Wastes

There is a continuing need for education about proper handling and disposal of moderate risk wastes, as evidenced by the occasional customer that brings inappropriate materials to the Jefferson County Waste Management Facility. There is also a need for more education on waste reduction methods for MRW, especially information about non-toxic alternatives and "use-it-up" campaigns.

9.10.3 Alternatives for Moderate Risk Wastes

Alternatives for moderate risk wastes include increased educational efforts and alternative disposal methods. For the latter, there are few options that could be used that would pose an improvement over current methods, although manufacturer responsibility mechanisms might be able to address specific types of waste. Improved collection capabilities and, if cost-effective, increased numbers of collection events might also help extend opportunities for proper disposal to a larger number of County residents.

9.10.4 Recommendations for Moderate Risk Wastes

The following recommendations are made for MRW (see also Recommendations WR3 and PE4):

S13) Existing collection efforts for MRW, including regional cooperation, will be continued and possibly expanded, where feasible.

S14) More education is needed for MRW, especially for non-toxic alternatives and waste reduction.

These recommendations should be considered an ongoing activity. Recommendation S13 has been given a medium priority for implementation and Recommendation S14 has been given a high priority (see Tables E.1 and E.2).

9.11 WOOD WASTE

9.11.1 Existing Conditions for Wood Waste

This section examines wood waste from logging and manufacturing activities, which is discussed separately here from wood waste that may be contained in the construction and demolition (C&D) waste stream (see Section 9.6) because the sources and patterns of generation are different for C&D wastes. In other words, this section discusses wood waste as it is defined by WAC 173-350 "consisting of wood pieces or particles generated as a by-product or waste from the manufacturing of wood products, construction, demolition, handling and storage of raw materials and trees and stumps," except that this section excludes wood from construction and demolition activities. The definition goes on to stipulate that "this includes, but is not limited to, sawdust, chips, shavings, bark, pulp, hog fuel, and log sort yard waste, but does not include wood pieces or particles containing paint, laminates, bonding agents or chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenic."

There are a few companies in Jefferson County that generate this type of wood waste, and the largest of these is Allen Logging Company on the west end of the County. The wood waste generated by Allen Logging consists of sawdust, planer shavings and hog fuel. The sawdust and planer shavings are used as a fuel in Allen Logging's boilers, and they burn about one ton per hour, 24 hours per day, of the sawdust and shavings. They also generate about an additional 50 tons per

day of wood waste that is sold as hog fuel to other companies. The current value of the hog fuel is about $12 per ton, or about enough to pay for the shipping cost of this material. Their logyard is paved with asphalt, and loose material that accumulates there is sold with the hog fuel. Altogether, Allen Logging generates an average of about 74 tons per day of wood wastes.

Three other large generators of wood waste are located in Port Townsend: Edensaw Woods, TimberCraft Homes, and the Port of Port Townsend. Edensaw Woods is a specialty wood supplier and custom wood product manufacturer. Edensaw generates about 600 cubic yards per month of various types of wood waste. Solid materials that they generate are brought to a wood recycling facility, while sawdust and shavings are used by a topsoil blending company. Edensaw also generates significant quantities of cardboard, which is recycled through Skookum, and plastic film, which used to be recycled through Marathon until their project failed.

TimberCraft Homes generates about two cords of clean wood ("off-cuts" and other pieces) per month, or the equivalent of about nine cubic yards per month. That material is burned in a wood stove for heating purposes. TimberCraft also generates about 20 cubic yards per month of sawdust, which is used by a farmer in Sequim as horse bedding and then it is composted.

The Port of Port Townsend generates an unknown but significant quantity of wood waste, but much of this is painted or preserved and partially deteriorated. Only a portion of the wood generated at the Port is clean wood waste that could potentially be diverted to other uses.

9.11.2 Needs and Opportunities for Wood Waste

The demand for hog fuel varies with oil prices, and so the value of hog fuel appears to be increasing and is expected to remain good into the future. Hence the material generated by Allen Logging should continue to have a stable or improving market for the foreseeable future. TimberCraft also feels that their wood waste will continue to be handled adequately.

The wood waste generated by Edensaw, however, needs to be shipped a significant distance and represents a substantial expense for them. A closer and/or higher-paying market would be better for them.

This page intentionally left blank to facilitate double-sided printing.

GLOSSARY

AND REFERENCES

This page intentionally left blank to facilitate double-sided printing.

GLOSSARY

The following definitions are provided for various terms used in the Jefferson County Solid Waste Management Plan:

Biomedical waste: infectious and injurious waste originating from a medical, veterinary, or intermediate care facility.

Biosolids: includes sludge from the treatment of sewage at a wastewater treatment plant and semisolid waste pumped from a septic system, that has been treated to meet standards for beneficial use.

Buy-back recycling center: a facility that pays people for recyclable materials.

Commercial solid waste: solid waste generated by non-industrial businesses. This includes waste from businesses that fall into the following categories; construction; transportation, communications and utilities; wholesale trades; retail trades; finance, insurance and real estate; other services; and government.

Commingled: recyclable materials that have been collected separately from garbage by the generator, but the recyclable materials have been mixed together in the same container.

Composting: the controlled biological decomposition of yard waste to produce a humus-like final product that can be used as a soil amendment. In this plan, backyard composting means a small-scale activity performed by homeowners on their own property, using yard wastes that they generate. Centralized composting refers to either drop-off or processing locations operated by a municipality or a business.

Corrugated cardboard (OCC): recyclable kraft liner cartons with corrugated inner liners, as typically used to ship materials. This generally does not include waxed cardboard or paperboard (cereal boxes, microwave and similar food boxes, etc.), but kraft grocery bags are included.

CPG: Coordinated Prevention Grants, a grant program administered by the Washington State Department of Ecology.

Curbside recycling: the act of collecting recyclable materials directly from residential generators, usually after the recyclable materials have been placed at the curb (or at the side of the street if no curb exists in the area) by the residents.

EPA: the United States Environmental Protection Agency; the federal agency responsible for promulgation and enforcement of federal environmental regulations.

Ferrous materials: materials that are predominantly (over 75% by weight) made of iron. Includes cans and various iron and steel alloys that contain enough iron such that magnets adhere to them, but for recycling this generally does not include paint cans or other containers that may contain hazardous residues.

Groundwater: water present in subsurface geological deposits (aquifers).

HDPE: high-density polyethylene, a type of plastic, commonly used in milk, detergent, and bleach bottles and other containers. Also used for lining and capping landfills.

Household hazardous waste: wastes that would be classified as hazardous due to their nature or characteristics, except that the amount is too small to be regulated. Includes aerosol cans, solvents, some paints, cleaners, pesticides, herbicides, compressed gases, oil, other petroleum products, car batteries and other materials.

Industrial waste: solid waste generated by various manufacturing companies. Includes waste generated by businesses that manufacture the following products; food, textile mill products, apparel, lumber, paper, printing, chemicals, stone, clay, glass, fabricated metals, equipment, and miscellaneous other products. Does not include hazardous wastes generated by these industries.

Inert wastes: includes wastes that are inert in nature, such as glass, concrete, rocks, gravel, and bricks.

Mixed paper: all other types of paper not included in newspaper, cardboard or high-grade papers. Includes materials such as "junk mail", magazines, books, paperboard (non-corrugated cardboard), and colored printing and writing papers.

Moderate risk wastes (MRW): households hazardous waste (see definition, above), and wastes produced by businesses that potentially meet the definition of a hazardous wastes except the amount of waste produced falls below regulatory limits.

MSW: municipal solid waste, see solid waste.

Mulching: 1) leaving grass clippings on the lawn when mowing; 2) placing yard wastes, compost, wood chips or other materials on the ground in gardens or around trees and shrubs to discourage weeds and retain moisture.

Non-ferrous: non-ferrous materials (other than aluminum cans), including products that are predominantly made of copper, lead, brass, tin, aluminum, and other metals except for iron.

ORCAA: the Olympic Region Clean Air Agency, an agency with regulatory and enforcement authority for air pollution issues in Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston Counties.

PET: polyethylene terephthalate, a type of plastic. Commonly used to refer to 2-liter beverage bottles, although other containers are also increasingly being made from this material, including liquid and solid materials such cooking oil, liquor, peanut butter, and many other food or household products.

Public education: a broad effort to present and distribute public information materials.

Public information: the development of educational materials for the public, including brochures, videos, and public service announcements.

RCW: Revised Code of Washington.

Recycling: the act of collecting and/or processing source-separated materials in order to return them to a usage similar in nature to their previous use.

Recycling bins: the small household containers used to set out materials for curbside collection.

Recycling containers: the large rectangular metal boxes designed to be placed at central locations to act as drop-off points for recyclable materials from many different households and businesses.

Reusable items: items that may be reused (or easily repaired), including things such as small electronic goods, household items such as dishes, and furniture.

Self-haul waste: waste that is brought to a landfill or transfer station by the person (residential self-haul) or company (non-residential or commercial self-haul) that created the waste.

Septage: a semisolid waste consisting of settled sewage solids combined with varying amounts of water and dissolved materials. This waste is pumped from a septic tank system.

Sewage sludge: the concentrated solids derived from the treatment of sewage at a municipal wastewater treatment plant. See also biosolids.

Single stream: refers to the practice of placing all recyclable materials together in one container for curbside collection. This is similar to "commingled" except that glass bottles may or may not be included in a commingled mixture whereas glass bottles are typically mixed with the other materials in single stream collection programs.

Solid waste: all putrescible and nonputrescible solid and semisolid wastes, including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, demolition and construction wastes, abandoned vehicles and parts thereof, discarded commodities, biosolids (sewage sludge and septage), wood waste, and special wastes.

Solid Waste Advisory Committee (SWAC): a group assisting Jefferson County with the development of this comprehensive solid waste management plan, composed of representatives from the general public, private industry, the City of Port Townsend and Jefferson County.

Special wastes: wastes that have particular characteristics such that they present special handling and/or disposal problems.

Source-separated: recyclable materials that have been removed from garbage or other forms of solid waste by the waste generator. This may or may not include keeping different types of recyclable materials separate from each other (see source-segregated and commingling).

SWAC: see Solid Waste Advisory Committee.

Transfer station: an intermediate solid waste disposal facility at which solid waste collected from any source is temporarily deposited to await transportation to a final disposal site.

UTC: Washington Utilities and Transportation Commission.

WAC: Washington Administrative Code.

Waste reduction or waste prevention: reducing the amount or type of solid waste that is generated. Also defined by state rules to include reducing the toxicity of wastes.

WDOE: Washington State Department of Ecology.

Yard debris: includes leaves, grass clippings, brush, and branches up to six inches in diameter.

REFERENCES

BioCycle 2005. BioCycle magazine. Mixed MSW Composting Facilities in the U.S., November 2005.

CH2MH 1996. CH2M Hill. Compost Facility Management and Financial Plan, April 1996.

CSWMB 1974. California Solid Waste Management Board. Technical Bulletin No. 2, Solid Waste Generation Factors in California, July 1974.

Ecology 1999. Washington State Department of Ecology. Guidelines for the Development of Local Solid Waste Management Plans and Plan Revisions, December 1999.

Ecology 2004a. Washington State Department of Ecology. Washington State Hazardous Waste Management Plan and Solid Waste Management Plan, November 2004.

Ecology 2004b. Washington State Department of Ecology. Financing Solid Waste for the Future, Publication #04-07-032, 2007.

GS 1998. Green Solutions. Snohomish County Waste Composition Study, November 1998.

GS 2003. Green Solutions. Clallam County Waste Composition Study, June 2003.

JC 2004. Jefferson County. Comprehensive Land Use Plan, last updated December 2004.

JC 2007. Jefferson County Department of Community Development. Information provided to Rick Hlavka on July 11, 2007.

KC 1998. King County. Agricultural Waste Issue Paper, November 1998.

MOEA 1998. Minnesota Office of Environmental Assistance. Assessment of the Effect of MSW Management on Resource Conservation and Greenhouse Gas Emissions, September 3, 1998.

ORCAA 2007. Olympic Region Clean Air Agency. Information provided by Debbie Moody to Rick Hlavka on January 17, 2007.

OFM 2002. Washington State Office of Financial Management. Washington State County Population Projections for Growth Management. January 2002 Projections.

OFM 2005. Washington State Office of Financial Management. 2005 Population Trends.

OFM 2006. Washington State Office of Financial Management. April 1 Population of Cities, Towns and Counties. June 29, 2006.

Parametrix 1993. Parametrix, Inc. Solid Waste Disposal Feasibility Study, October 1993.

PSR 1991. Paul S. Running & Associates. Jefferson County Hazardous Waste Management Plan, April 1991.

PT 1996. City of Port Townsend. Comprehensive Land Use Plan, July 1996.

SERA 1996. Skumatz Economic Research Associates. Quantitative Effects of Program Choices on Recycling and Green Waste Diversion: Beyond Case Studies, July 1996.

SN 2000. Website (http://www.secondnature.org/vision) for Second Nature - Education for Sustainability, quoting the Brundtland Commission (1987), downloaded June 2000.

SRM 1999. Sound Resource Management. The Monthly UnEconomist, September 1999.

USDA 2007. United States Department of Agriculture, National Agricultural Statistics Service. 2002 Census of Agriculture, as reported at www.nass.usda.gov, February 2007.

UTC 2001. Washington Utilities and Transportation Commission. Cost Assessment Guidelines for Local Solid Waste Management Planning, August 2001.

WCRC 2006. Washington Citizens for Resource Conservation. Survey of Household Medicines, January 2006.

APPENDIX A

PARTICIPATING JURISDICTIONS

This page intentionally left blank to facilitate double-sided printing.

Office of the Mayor
CITY HALL
Julie McCulloch
MAYOR

PORT TOWNSEND, WA 98368
(360) 385-3000

October 30, 1998

Klara Fabry, P.E.
Public Works Director/County Engineer
Jefferson County Department of Public Works
P. O. Box 2070
Port Townsend, WA 98368

Dear Klara,

Attached is a resolution previously adopted by the City Council authorizing Jefferson County to include the City of Port Townsend in its Comprehensive Solid Waste Management Plan. This resolution continues in effect, authorizing the County to include the City in the update of the Solid Waste Management Plan.

Sincerely,

Julie McCulloch, Mayor
City of Port Townsend

c:\cree\mayor\fabry.ltr]

RESOLUTION NO. 92-79

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PORT TOWNSEND AUTHORIZING JEFFERSON COUNTY TO INCLUDE THE CITY OF PORT TOWNSEND IN AN AMENDMENT OF THE JEFFERSON COUNTY COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN.

WHEREAS, under the provisions of RCW Chapter 70.95, Jefferson County is responsible for preparation, adoption and implementation of a Comprehensive Solid Waste management Plan, and

WHEREAS, the City of Port Townsend did, by Resolution 88-64, authorize Jefferson County to prepare a plan for the management of solid waste within the City of Port Townsend for inclusion as an element of the County Comprehensive Solid Waste Management Plan, and

WHEREAS, the Jefferson County Solid Waste Management Plan was adopted by the Board of County Commissioners on July 22, 1991 and by the City Council of the City of Port Townsend on August 6, 1991, and

WHEREAS, Jefferson County is required, under the amended RCW Chapter 70.95 and the associated Department of Ecology planning guidelines, to amend the Jefferson County Comprehensive Solid Waste Management Plan with respect to stated priorities for Waste Reduction and Recycling, Now, Therefore

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT TOWNSEND, that Jefferson County is hereby authorized to include the City of Port Townsend in an amendment process for the Jefferson County Comprehensive Solid Waste Management Plan and further authorizes assistance to the County in the determination of Waste Reduction and Recycling goals and in the implementation of strategies to achieve and document those goals. Any amendment to the Plan regarding the City of Port Townsend shall be reviewed and specifically adopted by the City Council of the City of Port Townsend before it shall become effective, and any financial implications to the City of either this Resolution or of the Plan Amendment shall be considered and approved by the City Council before implementation.

Passed by the City Council of the City of Port Townsend and approved by the Mayor this sixth day of July, 1992.

John M. Clise, Mayor

Attest:

David A. Grove, City Clerk

Approved as to form:

Dennis McLerran, City Attorney

APPENDIX B

RESOLUTIONS OF ADOPTION

This page intentionally left blank to facilitate double-sided printing.

APPENDIX B
RESOLUTIONS OF ADOPTION

NOTICE:

After the Final Draft of this SWMP has been adopted by the affected parties (Port Townsend, the Tribes, and Jefferson County), this appendix will document the adoption process by showing resolutions from the municipalities and tribal councils.

This page intentionally left blank to facilitate double-sided printing.

APPENDIX C

UTC COST ASSESSMENT QUESTIONNAIRE

This page intentionally left blank to facilitate double-sided printing.

APPENDIX C
UTC COST ASSESSMENT QUESTIONNAIRE

INTRODUCTION

The purpose of the information shown in this appendix is to allow an assessment of the impact of proposed activities on current and future garbage collection and disposal rates. By State law (RCW 70.95.090), solid waste management plans are required to include:

> "an assessment of the plan's impact on the costs of solid waste collection. The assessment shall be prepared in conformance with guidelines established by the Utilities and Transportation Commission. The Commission shall cooperate with the Washington state association of counties and the association of Washington cities in establishing such guidelines."

The following cost assessment questionnaire has been prepared in accordance with the guidelines provided by the Utilities and Transportation Commission (UTC 2001). The UTC needs this information to review the plan's impacts to the certificated waste haulers that it regulates, of which there are two in Jefferson County (Waste Connections and West Waste & Recycling). For these haulers, the UTC is responsible for setting collection rates and approving proposed rate changes. Hence, the UTC will review the following cost assessment, and then advise Jefferson County as to the probable collection rate impacts of proposed programs. Consistent with this purpose, the cost assessment focuses primarily on those programs (implemented or recommended) with potential rate impacts.

SUMMARY

As an update to the previous solid waste plan, this plan largely recommends continuing existing programs and hence does not create significant new or additional impacts to the solid waste system costs currently being incurred in Jefferson County.

UTC COST ASSESSMENT QUESTIONNAIRE

PLAN PREPARED FOR THE COUNTY OF: Jefferson

PLAN PREPARED FOR THE CITY OF: NA

PREPARED BY: Rick Hlavka, Green Solutions

CONTACT TELEPHONE: (360) 897-9533 DATE: October 8, 2007

DEFINITIONS

Definitions used in the Solid Waste Management Plan and the Cost Assessment Questionnaire.

Throughout this document:
YR. 1 shall refer to 2008
YR. 3 shall refer to 2010
YR. 6 shall refer to 2013

Year refers to **Calendar Year** (Jan 01 - Dec 31)

1.0 DEMOGRAPHICS

1.1 Population

1.1.1 Total population of the County:

Year 1	Year 3	Year 6
29,550	30,890	32,820

1.1.2 Population of the area included in the solid waste management plan:

Year 1	Year 3	Year 6
29,550	30,890	32,820

1.2 References and Assumptions

See Tables 2-2 and 2.4.

2.0 WASTE STREAM GENERATION

2.1 Tonnage Recycled

2.1.1 Total tonnage recycled in the base year, and projections for years three and six.

Year 1	Year 3	Year 6
23,290	24,340	25,850

2.2 Tonnage Disposed

2.2.1 Total tonnage disposed in the base year, and projections for years three and six.

Year 1	Year 3	Year 6
22,300	23,400	24,840

2.3 References and Assumptions

See Table 2-4.

3.0 SYSTEM COMPONENT COSTS

3.1 Waste Reduction Programs

3.1.1 Solid waste programs which have been implemented and proposed programs.

Implemented	Proposed
See pages 3-4 and 3-5	This solid waste plan recommends that existing programs be continued, and no new programs are being proposed.

3.1.2 Costs for waste reduction programs implemented and proposed?

Implemented *		
Year 1	Year 3	Year 6
221,000	230,000	245,000
Proposed		
Year 1	Year 3	Year 6
NA	NA	NA

* includes current public education and recycling costs.

3.1.3 Funding mechanism(s) that will pay the cost of the programs in 3.1.2.

Implemented		
Year 1	Year 3	Year 6
Tipping Fee and CPG Funds	Tipping Fee and CPG Funds	Tipping Fee and CPG Funds
Proposed		
Year 1	Year 3	Year 6
NA	NA	NA

3.2 Recycling and Composting Programs

3.2.1 Proposed or implemented recycling program(s), costs, and proposed funding mechanism:

Implemented		
Program	**Cost**	**Funding**
Continued examination of efficiencies and opportunities	Included in Section 3.1.2	Tipping Fee and CPG Funds
Public recycling containers throughout county	Included in Section 3.1.2	Tipping Fee and CPG Funds
Proposed		
Program	**Cost**	**Funding**
Recycling Potential Assessment	Contingent on the availability of grant funds	Grants

3.3 Solid Waste Collection Programs

3.3.1 Regulated Solid Waste Collection Programs

UTC Regulated Hauler Name	Waste Connections		
G-Permit #9			
	Year 1	Year 3	Year 6
Residential and Commercial			
# of Customers	3,193	3,340	3,540
Tonnage Collected	3,215	3,360	3,570

UTC Regulated Hauler Name	West Waste & Recycling		
G-Permit #251			
	Year 1	Year 3	Year 6
Residential			
# of Customers	41	41	41
Tonnage Collected	77	77	77
Commercial			
# of Customers	11	11	11
Tonnage Collected	152	152	152

3.3.2 Other (non-regulated) Solid Waste Collection Programs.

Hauler Name	Waste Connections (contract with Port Townsend)		
Residential and Commercial	Year 1	Year 3	Year 6
# of Customers	3,225	3,370	3,580
Tonnage Collected	3,175	3,320	3,530

3.4 Energy Recovery & Incineration (ER&I Programs)

NA, no such facilities

3.5 Land Disposal Program

NA, no such facilities

3.6 Administration Program

3.6.1 What is the budgeted cost for administering the solid waste and recycling programs and what are the major funding sources.

Budgeted Cost		
Year 1	Year 3	Year 6
322,000	335,000	337,000
Funding Source		
Year 1	Year 3	Year 6
Tipping Fee	Tipping Fee	Tipping Fee

3.6.2 Which cost components are included in these estimates?

Management and planning services provided by County departments.

3.6.3 Funding mechanism(s) that will recover the cost of each component.

Tipping Fees

3.7 Other Programs

3.7.1 Describe the program, or provide a page number reference to the plan.

Moderate-Risk Waste Facility, see pages 9-15 and 9-16.

3.7.2 Owner/Operator: Jefferson County

3.7.3 Is UTC Regulation Involved?

No

3.7.4 Anticipated costs for this program, including capital and operating expenses.

Year 1	**Year 3**	**Year 6**
112,000	118,000	130,000

3.7.5 Funding mechanism(s) that will recover the cost of this component.

Tipping Fees
Coordinated Prevention Grant
Fees charged to Small Quantity Generators

3.8 References and Assumptions

Costs shown in Section 3.1.2 include public education costs and recycling program costs. Costs are escalated at 2.1%, based on the increase in expenses incurred in the past two years (see Table 8.1).

For section 3.3.1, the number of customers and tonnages collected for Waste Connections is based on the current number of customers and 2006 tonnages, and is projected to future years based on the same projected increases in population as shown in Table 2.4 of the solid waste plan. For West Waste & Recycling service area, current figures are assumed to remain unchanged for future years because little or no population growth is projected for the west end of Jefferson County. Tonnages collected by West Waste & Recycling are estimated based on typical densities for commercial garbage (100 pounds per cubic yard) or number of customers and typical generation rates for residential (see Table 2.3).

For Section 3.7.4, costs for MRW operations are assumed to increase 3% annually.

4.0 FUNDING MECHANISMS

4.1 Funding Mechanisms (Summary by Facility)

The following tables provide information on funding sources for programs and activities.

Table 4.1.1 Facility Inventory

Facility Name	Type of Facility	Tip Fee	Transfer Cost	Transfer Station Location	Final Disposal Location	Total Tons Disposed (2006)	Total Revenue Generated (Tip Fee x Tons)
Jefferson County Waste Management Facility (JCWMF)	Transfer Station	$110.00 per ton	NA	Near Port Townsend	Roosevelt Regional Landfill	20,912	$2,366,391
Quilcene Drop Box	Drop Box	$27.23 per c.y.	NA	Quilcene area	Roosevelt Regional Landfill (through JCWMF)	215	$42,499

Table 4.1.2 Tip Fee Components

Tip Fee by Facility	Surcharge	City Tax	State and County Tax	Trans. and Disposal Cost	Operational Cost	Admn. Cost	Closure Costs
Jefferson County Waste Management Facility (JCWMF)	NA	NA	NA	NA	NA	NA	NA
Quilcene Drop Box	NA	NA	NA	NA	NA	NA	NA
All Facilities	0	0	1.8%	53.9%	14.5%	12.3%	0.6%

Table 4.1.3 Funding Mechanism

Name of Program	Bond Name	Total Bond Debt	Bond Rate	Bond Due Date	Grant Name	Grant Amount	Tip Fee	Taxes	Other	Surcharge
Recycling and Education							$222,000			
Moderate-Risk Waste					CPG	$58,000	$49,000		$5,000	

Table 4.1.4 Tip Fee Forecast						
Tip Fee per Ton	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Jefferson County Waste Management Facility (JCWMF)	$110.00	$110.00	$110.00	$110.00	$110.00	$110.00
Quilcene Drop Box	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00

Note: The tip fee shown in the above table is for larger loads of mixed solid waste (i.e., amounts above the minimum charge). Fees for Years One through Three are from the county budget, but years Four through Six have not been determined yet. For present planning purposes, the projected fees shown in Table 4.1.4 for Years Four through Six assume a 0% increase, which is the same as what has occurred over the previous seven years (rates have not changed since 1999).

4.2 Funding Mechanism Summary:

4.2.1 Year One

Funding Mechanism (in percent)							
Component	**Tip Fee**	**Grant**	**Bond**	**Collection Tax**	**Rates, Service Fees**	**Other**	**Total**
Waste Reduction	100						100
Recycling	100						100
Collection					100		100
ER&I	100						
Transfer	100						100
Land Disposal	100						100
Administration	100						100
Other							
Moderate-Risk Waste	44	52			4		100

4.2.2 Year Three

Funding Mechanism (in percent)							
Component	**Tip Fee**	**Grant**	**Bond**	**Collection Tax**	**Rates, Service Fees**	**Other**	**Total**
Waste Reduction	100						100
Recycling	100						100
Collection					100		100
ER&I	100						
Transfer	100						100
Land Disposal	100						100
Administration	100						100
Other							
Moderate-Risk Waste	44	52			4		100

4.2.3 Year Six

Funding Mechanism (in percent)							
Component	**Tip Fee**	**Grant**	**Bond**	**Collection Tax**	**Rates, Service Fees**	**Other**	**Total**
Waste Reduction	100						100
Recycling	100						100
Collection					100		100
ER&I	100						
Transfer	100						100
Land Disposal	100						100
Administration	100						100
Other							
Moderate-Risk Waste	44	52			4		100

4.3 References and Assumptions

See Section 14.

For Table 4.1.2, costs not included in the breakdown for the tipping fee include recycling and education (11.3%) and MRW operations (5.7%).

4.4 Surplus Funds

NA

This page intentionally left blank to facilitate double-sided printing.

APPENDIX D

SEPA COMPLIANCE

This page intentionally left blank to facilitate double-sided printing.

APPENDIX D
SEPA COMPLIANCE

INTRODUCTION

This appendix contains the environmental checklist as required by the State Environmental Policy Act (SEPA). The purpose of the checklist is to provide information on the environmental impacts of the activities proposed by this Solid Waste Management Plan (SWMP).

The rest of this appendix is the Determination of Non-Significance (DNS) and the SEPA checklist for this SWMP. Much of this checklist addresses only the general concerns related to the County's solid waste system, but specific actions proposed by this SWMP are addressed as appropriate. One or more of the activities discussed in the SWMP may require separate SEPA processes when implementation plans are more fully developed.

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

   Jefferson County Solid Waste Management Plan

2. Name of applicant:

   Jefferson County

3. Address and phone number of applicant and contact person:

   Project Manager:
   Al Cairns
   Solid Waste Coordinator
   Jefferson County Dept. of Public Works
   (360) 385-9243

   Consultant:
   Rick Hlavka
   Green Solutions
   PO Box 680
   South Prairie, WA 98385
   (360) 897-9533

4. Date checklist prepared:

   September 28, 2007

5. Agency requesting checklist:

   Washington State Department of Ecology (WDOE). State law regarding solid waste management plans requires a SEPA checklist.

6. Proposed timing or schedule (including phasing, if applicable):

   The Jefferson County SWMP recommends various solid waste management programs to be continued or developed over the next five years.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal. If yes, explain.

   Yes. State law requires solid waste management plans to be reviewed every five years, and updated if necessary.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   NA

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No.

10. List any government approvals or permits that will be needed for your proposal, if known.

In order to participate in the SWMP, each local jurisdiction will need to approve and adopt the SWMP. These jurisdictions include Jefferson County, the City of Port Townsend, and possibly the Hoh, Quinault, and Jamestown S' Klallam Tribal Councils.

Building and other permits may be necessary to implement a few of the recommendations being made by this SWMP, but these permits (and an environmental review process, if necessary) will be sought through separate processes at a later date.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page (Lead agencies may modify this form to include additional specific information on project description).

The Solid Waste Management Plan (SWMP) is a twenty-year plan for the unincorporated and incorporated areas of Jefferson County. Federal rules require that the Olympic National Park and the Olympic National Forest abide by the policies and programs in this SWMP.

This SWMP discusses all aspects of solid waste management within the County and incorporated areas, including waste reduction, recycling, composting, energy recovery, collection, transfer, import/export, waste disposal, and regulation and administration. Specific recommendations are made for all of these elements, but in most cases these recommendations represent program or policy refinements that have no significant environmental impacts.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The activities proposed by this SWMP will generally take place throughout Jefferson County, although a few of the recommendations are for specific areas or sites.

B. ENVIRONMENTAL ELEMENTS

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

1. EARTH

a. General description of the site (circle one):
Flat, rolling, hilly, steep slopes, mountainous, other __.

The specific sites impacted by the SWMP's recommendations are generally the occupied areas in the County, which are flat or rolling.

b. What is the steepest slope on the site (approximate percent slope)?

Does not apply.

b. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Does not apply.

c. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Does not apply.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Does not apply.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Does not apply.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or building)?

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Does not apply.

2. AIR

a. What types of emissions to the air would result from the proposal i.e., dust, automobile odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

No significant amounts of emissions are anticipated as a result of any of the recommendations made by the SWMP.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Does not apply.

c. Proposed measures to reduce or control emissions or other impacts to air, if any.

Does not apply.

3. WATER

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate state what stream or river it flows into.

Does not apply.

2) Will the project require any work over, in, or adjacent to (within 200 feet) of the described waters? If yes, please describe and attach available plans.

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Does not apply.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Does not apply.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example, domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Does not apply.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Does not apply.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Does not apply.

4. PLANTS

a. Check or circle types of vegetation found on the site:

___ deciduous tree: alder, maple, aspen, other
___ evergreen tree: fir, cedar, pine, other
___ shrubs
___ grass
___ pasture
___ crop or grain
___ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
___ water plants: water lily eelgrass, milfoil, other
___ other types of vegetation

All of these types of vegetation can be found in Jefferson County.

b. What kind and amount of vegetation will be removed or altered?

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

c. List threatened or endangered species known to be on or near the site.

Does not apply.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

Does not apply.

5. ANIMALS

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

Birds: hawk, heron, eagle, songbirds, other
Mammals: deer, bear, elk, beaver, other
Fish: bass, salmon, trout, herring, shellfish, other

All of these types of animals can be found in Jefferson County.

b. List any threatened or endangered species known to be on or near the site.

Does not apply.

c. Is the site part of a migration route? If so, explain.

Does not apply.

d. Proposed measures to preserve or enhance wildlife, if any.

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

6. ENERGY AND NATURAL RESOURCES

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Several of the activities recommended in the SWMP will require small additional amounts of electrical power to support normal, everyday activities.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

Does not apply.

7. ENVIRONMENTAL HEALTH

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

No, although the SWMP encourages continuing and possibly expanding a related activity (moderate risk waste collections) that should help prevent this type of problem in the future.

1) Describe special emergency services that might be required.

Does not apply.

2) Proposed measures to reduce or control environmental health hazards, if any:

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Does not apply.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Does not apply.

3) Proposed measures to reduce or control noise impacts, if any:

Does not apply.

8. LAND AND SHORELINE USE

a. What is the current use of the site and adjacent properties?

Does not apply.

b. Has the site been used for agriculture? If so, describe.

Does not apply.

c. Describe any structures on the site.

Does not apply.

d. Will any structures be demolished? If so, what?

Does not apply.

e. What is the current zoning classification of the site?

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

f. What is the current comprehensive plan designation of the site?

Does not apply.

g. If applicable, what is the current shoreline master program designation of the site?

Does not apply.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Does not apply.

i. Approximately how many people would reside or work in the completed project?

Does not apply.

j. Approximately how many people would the completed project displace?

Does not apply.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Does not apply.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Does not apply.

9. HOUSING

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Does not apply.

c. Proposed measures to reduce or control housing impacts, if any:

Does not apply.

10. AESTHETICS

a. What is the tallest height of any proposed structure(s), not including; antennas what is the principal exterior building material(s) proposed?

Does not apply.

b. What views in the immediate vicinity would be altered or obstructed?

Does not apply.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Does not apply.

11. LIGHT AND GLARE

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Does not apply.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Does not apply.

c. What existing off-site sources of light or glare may affect your proposal?

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

d. Proposed measures to reduce or control light and glare impacts, if any:

Does not apply.

12. RECREATION

a. What designated and informal recreational opportunities are in the immediate vicinity?

Does not apply.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Does not apply.

e. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Does not apply.

13. HISTORIC AND CULTURAL PRESERVATION

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

Does not apply.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

Does not apply.

c. Proposed measures to reduce or control impacts, if any:

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

14. TRANSPORTATION

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Does not apply.

b. Is site currently served by public transit? If no, what is the approximate distance to the nearest transit stop?

Does not apply.

c. How many parking spaces would the completed project have? How many would the project eliminate?

Does not apply.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

Does not apply.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

Does not apply.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Implementing the SWMP may cause slight increase in vehicular traffic, and future increases in waste tonnages will increase truck transportation requirements (for waste export containers and garbage collection vehicles).

g. Proposed measures to reduce or control transportation impacts, if any:

Does not apply.

EVALUATION FOR
AGENCY USE ONLY

15. PUBLIC SERVICES

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

Does not apply.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Does not apply.

16. UTILITIES

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

Does not apply.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Date Submitted: _____

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

By providing for secure disposal of solid wastes and increased recycling activities, the SWMP is expected to decrease impacts and discharges to water and air, and to provide for more secure handling of toxic or hazardous substances that may be part of the solid waste stream. No substantial increases or decreases in noise levels are expected as a result of the SWMP's recommendations.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

No significant impacts to plant, animal, fish, or marine life are expected.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Does not apply.

3. How would the proposal be likely to deplete energy or natural resources?

A small amount of energy and materials will be needed to implement the recommendations in the SWMP, but this is expected to be more than offset by the energy and resources conserved as the result of increased waste prevention, recycling and composting recommended by the plan.

Proposed measures to protect or conserve energy and natural resources are:

Does not apply.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

   No substantial impacts, either positive or negative, to environmentally sensitive or other protected areas are expected to result from the recommendations in the SWMP.

   Proposed measures to protect such resources or to avoid or reduce impacts are:

   Does not apply.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

   No substantial impacts, either positive or negative, to land and shoreline use are expected to result from the recommendations in the SWMP.

   Proposed measures to avoid or reduce shoreline and land use impacts are:

   Does not apply.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

   Minor changes are proposed for public services and to several aspects of the waste collection system.

   Proposed measures to reduce or respond to such demand(s) are:

   Does not apply.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

   The SWMP was prepared in response to a State requirement for the proper management of solid waste, and it complies with all applicable local, state and federal laws and requirements regarding protection of the environment.