UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

TRIBAL DECISION-MAKER'S GUIDE TO SOLID WASTE MANAGEMENT

WASTE MANAGEMENT IN INDIAN COUNTRY

TRIBAL DECISION-MAKERS' GUIDE TO SOLID WASTE MANAGEMENT

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Chapter 1. Introduction

The Solid Waste Dilemma

What is the best way to manage solid waste? This is a question that many Native American tribes and Alaskan Native villages face today. Tribes in rural areas face illegal dumping issues. Alaskan Native villages struggle to find cost-effective and safe alternatives to open dumps. Tires, appliances, furniture, car batteries, and abandoned cars litter many reservations. Backyard burning of household waste pollutes the air and poisons fish and wildlife. This guide is designed to help tribes and villages to find solutions to these problems, improve existing systems, and develop effective solid waste management programs.

The types of solid waste management programs being run by tribes and Native villages are varied and diverse, ranging from simple, one-step disposal programs to complex management programs intertwining recycling, composting, and disposal. Some tribes have sophisticated recyclables collection and marketing programs, others run landfills or transfer stations on the reservation, while still others are struggling to clean up and close open dumps or determine the best way to dispose of bulky items and other trash littering the reservation.

In the past, tribal members and Alaskan Native villagers have disposed of their waste in open pits or by burning it, with few environmental or health impacts. Due to changes in the types and volumes of waste generated today, however, these practices are no longer safe or effective ways to manage waste. The increase in plastics and other synthetic materials in our waste stream, in addition to the growth in sheer volume of waste, makes backyard burning and open dumping dangerous to human health and the environment. Public health and environmental concerns include an increased incidence of disease, food and drinking water contamination, and air pollution.

Open dumps can attract young children and pets. Children playing in or rummaging through open dumps can be hurt by sharp objects. They also can come in contact with toxic materials or contagious pathogens, which can lead to gastroenteritis; skin rashes and infections; or eye, nose, and ear infections. Open dumps also attract pests such as insects, rats, dogs, bears, birds, and raccoons that can spread disease or physically injure people. Chemicals and bacteria from these dumps can run off into rivers and lakes, contaminating drinking water sources and fish and game. Native Americans and Alaskan

Native villagers dependent upon fish and game for subsistence living are especially vulnerable to illness resulting from open dump contamination.

Burning waste in barrels, boxes, or open pits releases dangerous chemicals into the atmosphere that are inhaled immediately or settle on plants and bodies of water, entering the food chain. Air pollutants released by backyard burning include dioxins, fine particulate matter, carbon monoxide, nitrogen oxides, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and hydrogen chloride. The ash residue from burning also can contain dangerous levels of toxic heavy metals, such as mercury, lead, chromium, and arsenic, which can contaminate water or enter the food chain.

The impacts of improper solid waste management go beyond these health and environmental problems. Open dumps degrade the land by destroying fish and wildlife habitats. Many tribes and villages depend on these natural resources for economic and cultural survival. In the Pacific Northwest, for example, salmon are central to many tribes' social, spiritual, and economic livelihoods. Open dumping and burning can further threaten these species. Open dumping also degrades natural resources, such as timber, agriculture land, and recreational areas. In some cases, open dumping even infringes upon or threatens culturally or spiritually significant lands.

Making Solid Waste Management a Priority

Solid waste management touches all aspects of tribal and village life—public health, environmental quality, economic development and prosperity, community pride and identity, tribal culture, and land stewardship. But tribes often have limited resources. Equally important competing interests, such as education, physical and mental health, employment, and economic development, often take precedence over solid waste and exhaust tribal funds.

Even when tribal environmental and natural resource divisions obtain funds, solid waste management concerns often are seen as secondary to drinking water and water quality concerns. Many tribal solid waste managers

An illegal dump site on the Seminole Nation of Oklahoma's reservation.

have to make the case to their tribal councils and communities that solid waste management is an issue that warrants attention and adequate funding. The managers who are successful are those who are able to demonstrate the extent of the problem and show how it is integrally connected to the community's other concerns. In some cases, making solid waste a tribal priority reaps financial benefits, too. In order to obtain Indian Health Service (IHS) Sanitation Deficiency System funding for a solid waste related project, for example, a tribe often must designate solid waste management as its number-one priority.

Goals of This Guide

Each tribe is unique, with its own history, culture, financial situation, and geographic location. But even though tribes have their own separate identities, they share common problems. The primary objective of the *Tribal Decision-Makers' Guide to Solid Waste Management* is to provide a variety of options and technical assistance solutions to help tribes and Alaskan Native villages protect their environment and the health of their members. To achieve this goal, the guide recommends developing and implementing an integrated solid waste management (ISWM) program.

No two ISWM programs will be exactly alike due to the differing geography, demographics, financial situation, and culture of each tribe and Alaskan Native village. While the specifics of each program will likely vary, every successful integrated solid waste management program will possess five fundamental components. These five components form the core of any integrated solid waste management program:

Solid Waste Management Plan — A solid waste management plan is the foundation of any ISWM program.

Solid Waste Codes, Ordinances, or Regulations — Codes, ordinances, and regulations provide the legal justification for your ISWM and the authority to ensure compliance.

Enforcement Mechanisms — Solid waste codes, ordinances, and regulations are only effective if they are consistently and equitably enforced.

The same site after cleanup.

Viable Solid Waste Disposal Options — Proper solid waste management and disposal mechanisms ensure that your tribe or village's waste ends up in a licensed, certified, or permitted landfill or municipal solid waste incinerator and not an open dump.

Community Outreach and Education — Community outreach and education promote understanding, support, and participation in your ISWM program.

While reuse, recycling, composting, and waste prevention/source reduction are other important components of an ISWM program, they are not sufficient to ensure proper solid waste management in the absence of the core components. Incorporating these other components into a well planned and implemented core program can only increase the effectiveness of your ISWM program, but you must have the core program to ensure success.

To help tribal leaders and decision-makers clarify their solid waste goals and objectives and assess management options, the guide is divided into six sections, each focusing on a different component of an ISWM program. These sections include:

- **Developing Solid Waste Management Plans:** Describes why a tribe or village would want to develop a solid waste management plan, what the plan should include, and where to get help in developing the plan. The chapter also includes links to solid waste management plans drafted and used by individual tribes.
- **Developing, Implementing, and Enforcing Solid Waste Codes, Laws, and Regulations:** Describes and provides examples of how to develop, implement, and enforce solid waste codes. Provides examples of actual regulatory language used by other tribes and villages, numerous examples of effective enforcement strategies and practices, and information on working within the federal regulatory framework.
- **Solid Waste Collection and Disposal Programs:** Outlines and describes several waste collection and disposal options. Also discusses strategies to control illegal dumping and close open dumps.
- **Waste Reduction, Buying Recycled, and Manufacturing with Recovered Materials:** Discusses reasons for developing source reduction, recycling, composting and buy-recycled programs and how to start these programs, as well as information on manufacturing with recovered materials. Provides numerous examples of tribes and Alaskan Native villages with successful programs.
- **Public Education and Community Outreach:** Discusses approaches to developing and instituting an effective community outreach and education program. Provides different examples of initiatives aimed at children, adults, and tribal and village leaders.
- **Funding Your Solid Waste Management Program:** Provides tips for identifying grants and loans and ways to improve your grant applications. Also discusses different internal sources for funding your program.

Incorporated throughout the guide are examples of tribes and villages finding solutions to solid waste problems through creativity, flexibility, and perseverance. The case studies and examples also demonstrate the benefits of forming partnerships and collaborating with other tribes, villages, neighboring counties, and state and federal agencies. These stories illustrate that while creating an effective solid waste management program is often a challenging endeavor, success is possible.

Chapter 2. Developing Solid Waste Management Plans

Solid waste management plans offer a host of benefits for tribes and Alaskan Native villages. Through the preparation of these plans, you can assess your current and future waste management needs, set priorities, and allocate resources accordingly. Working through these issues can help you ensure your waste management system offers the highest level of protection to the health of tribal members and the natural environment. This chapter explains the purpose of solid waste management plans and the steps involved in developing these plans. It also includes references to solid waste management plans that tribes have already developed and are successfully implementing. Throughout this chapter, several publications are cited or referenced. For a complete listing of these documents and specific ordering information, refer to the Resources section at the end of this chapter.

> "Solid waste management is an evolving program in which planners try one strategy, and, if they are unsuccessful, change and try another."
>
> ~Laura Weber,
> Director of Solid Waste Management,
> St. Regis Mohawk Tribe

What Is a Solid Waste Management Plan?

A solid waste management plan is simply a document developed by a tribe or Alaskan Native village that outlines how the tribe or Native village will reduce, manage, and dispose of its solid waste. A solid waste management plan will assist and guide your tribe or village in developing and implementing its solid waste management program by establishing what actions need to be taken and setting the criteria for decision-making.

A basic solid waste management plan typically includes:

- A profile of the tribal community.
- The goals and objectives of the plan.
- An overview of the existing solid waste management program.
- Solid waste management alternatives, along with a discussion of the issues and uncertainties associated with each alternative.
- The selected alternative, implementation measures, and potential funding sources.

- Any solid waste codes that need to be developed.

Reasons To Develop a Solid Waste Management Plan

Planning is the first step in designing or improving a solid waste management system. A solid waste management plan will help your tribe take institutional, social, financial, economic, technical, and environmental factors into consideration as it manages its waste stream.

A solid waste management plan is a practical document that can help guide your community's solid waste management efforts. It can help you:

- Define and understand current waste management practices and the system in place.
- Identify problems and deficiencies with the current system.
- Identify opportunities for improvement in the current system.
- Set priorities for action to address problems and affect improvement.
- Measure progress toward implementing actions.
- Identify the resources needed and develop budgets and schedules.
- Revisit and modify priorities as the plan develops.

A solid waste management plan also can support proposals for solid waste management grants. Government agencies that provide financial assistance to tribal communities for solid waste management place a high priority on good planning to support a grant proposal. Agencies involved in funding tribal solid waste management projects often prefer that a tribe complete a solid waste management plan as a prerequisite for grant applications related to solid waste handling facilities or closing open dumps. In addition, tribes can ask for funding for a project that is a step toward solving, but does not completely solve, a solid waste problem. For example, an agency might be more likely to fund clean up and closure of an open dump site if the tribe offers a plan addressing the waste currently being generated, such as taking waste off site to an approved facility. See Chapter 7 for more information on grants and other funding sources.

Determining the Scope of the Solid Waste Management Plan

Several factors help determine the scope of a solid waste management plan, including available funding and technical expertise. You might not have the resources on hand to develop a comprehensive plan initially, but starting a plan is still useful. Solid waste management plans are living documents that can be revisited and revised.

Your initial plan can describe existing waste management practices, identify existing system limitations and opportunities for improvement, and delineate a plan of action to address these limitations and make improvements. If it is well thought out and effectively describes your tribe's priorities, goals, and plans, this initial plan will be sufficient to support your requests for funding future activities.

The Hannahville Indian Community in northern Michigan prepared an initial plan presenting basic information about the tribe and its solid waste needs, including a description of the reservation's location and geography, existing conditions, a brief waste stream analysis, an evaluation of the tribal solid waste management program, and a 3-year action plan. The Washington-based Spokane Tribe of Indians' solid waste management plan also presents basic information and includes details on regulatory requirements and landfill closure.

Figure 1 illustrates all of the steps in the comprehensive solid waste management planning process, from planning to implementation. This diagram can help you see where you are in the process and determine the path you need to take.

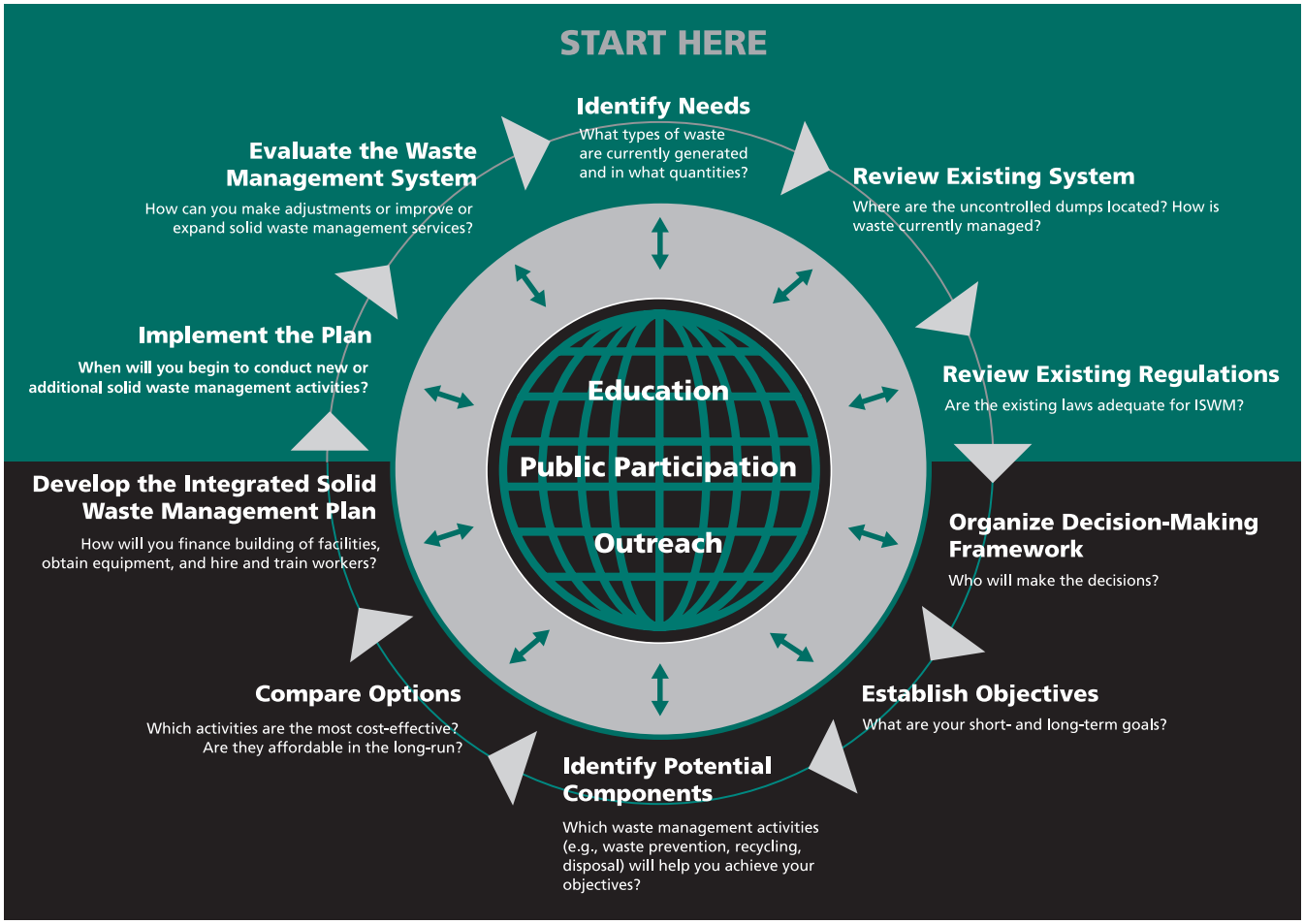
Developing Long-Term and Short-Term Goals

Solid waste management is a complex puzzle with many pieces, and it is easy to get sidetracked in your planning process. Developing goals will help guide your solid waste management planning and keep you focused on your priorities. Goals also can help you set targets by which your tribe can measure progress.

A good way to determine your goals is to develop a list of your tribe's values and what you want to accomplish. Look for problems that require solutions, and actively solicit input from the tribe, including tribal members. Typical considerations related to solid waste management are:

- Protecting tribal members' health and safety.
- Protecting the natural environment.
- Complying with federal and tribal laws.
- Protecting and conserving natural and cultural tribal resources.
- Contributing to the economic development of the tribe.

Figure 1. Comprehensive Integrated Solid Waste Management Planning Process



For each problem or proposed improvement you identify, develop a goal statement. For example, if the community has a problem with uncontrolled open dumping that is impacting the natural environment, a typical goal statement could be: Control open dumping as necessary to protect the environment and tribal resources. One action related to this goal could be developing and enforcing regulations that prohibit open dumping. The tribe would measure success by how much open dumping decreases.

The Gila River Indian Community in Arizona identified illegal open dumping as a goal to address. The community added a provision about illegal dumping to its Solid Waste Management Ordinance and held a workshop for tribal officials to discuss how to enforce the provision and delegate enforcement responsibility. The community also maps dump sites and categorizes them into three levels of risk so it can focus its limited resources on sites that pose the most severe health threats. The tribe measures its success by the reduction in the number of illegal dump sites in the community.

Key Decisions To Be Made on Basis of Plan

The solid waste management plan will provide information and guidance you need to make critical waste management decisions, such as whether you need a transfer station for exporting solid waste or need to construct a landfill on your reservation. The plan also can help your tribe focus on solid waste management enhancements, including waste prevention, materials reuse, recycling, and household hazardous waste management. Key decisions your tribe can address in the planning process include:

- How important is waste reduction, as a priority, compared with other solid waste management priorities?
- What opportunities exist for waste reduction?
- Which materials can be recycled?
- What type of waste and recyclables collection system can the tribe use?
- What type of disposal system can the tribe use?
- What will the present/future costs of the waste management program be?
- What resources does the tribe need to implement its solid waste management plan?
- What resources are available to the tribe?

Getting Started

Before your tribe starts drafting its solid waste management plan, you should consider a few key parameters that will provide a framework around which planning can take place. These include:

- Defining the planning area.
- Identifying the regulatory entities within the planning area.
- Establishing planning periods.
- Developing a community education and outreach plan to solicit public input.

Defining the Planning Area

A natural planning area for tribal communities or nations is defined by the reservation boundary. Some tribes will have a contiguous boundary, while other tribes will have more of a “checkerboard” boundary, whereby some areas of the reservation are not directly connected to other areas. At minimum, the planning area should reflect the extent of the area serviced by the current solid waste management program.

Identifying the Regulatory Entities Within the Planning Area

Regulatory entities will include tribal environmental programs and the other tribal programs that handle solid waste. Include not only the entities actively managing your solid waste, but also departments that might be able to contribute resources, such as the road department for construction equipment, and those that can assist with regulatory development and implementation. Also consider community, county, state, and federal agencies. Tribes might fall under more than one state regulatory entity. Look for opportunities to pool resources and share information and costs.

Establishing Planning Periods

Determine the time period your plan will cover. Typically, a solid waste management plan will cover 20 years, with 5-year review intervals. Longer terms may be needed to site and construct new facilities. Siting, designing, permitting, and constructing a new landfill may take 10 years, while it may take 3 years to design and construct a recycling facility. Regardless of the planning period, the tribe should build a regular review interval into the plan. Review periods let planners incorporate new regulations, changes in waste generation rates, or experience gained from operating the solid waste management program.

Developing a Community Education and Outreach Plan To Solicit Public Input

The backbone of waste management planning is public involvement, participation, and cooperation. The planner can compile data, estimate costs, and develop lists of potential sites and solid waste management options; however, the choices and positive changes must ultimately come from within the tribal community. Tribal education and outreach is a continuous process that includes a variety of activities, such as distributing newsletters, sponsoring open houses, mailing fact sheets, conducting community surveys, and distributing information through advisory groups and committees, public meetings, interviews, and workshops. For more information on developing an education and outreach campaign, refer to Chapter 6.

Steps in Developing a Solid Waste Management Plan

Solid waste management planning is specific to each tribe. The lack of technical or financial resources needed to develop a solid waste management plan can be a drawback for many tribes. Available resources can vary greatly from one tribe to another—every tribe comes into the planning process at a different place. Some tribes have access to landfills but are considering implementing source reduction and recycling programs to reduce disposal costs. Others need to close open dumps, which often requires implementing new waste management practices such as finding an appropriate facility for discarding waste before the dump can be closed.

The following steps outline the general process required to develop your solid waste management plan. As you go through this process, remember to stay focused on your goals. You might wish to revisit and modify your goals as you develop a better understanding of your situation.

Step 1: Develop a Profile of the Planning Area.

Compile information on the population, number of households, and estimated growth rate of your tribe. This can include information on any planned economic development. The tribe can use this information to estimate the present and future waste stream. Information on climate, geology, and natural resources also is important to have when you

are siting waste handling facilities. Identifying transportation routes, distances to potential recycling markets, distance to solid waste (Subtitle D) landfills and other disposal sites, and infrastructure needs will help you when you are developing cost estimates for waste management activities. The Hannahville Indian Reservation in northern Michigan, for example, is composed of 13 separate parcels of land, so its plan identifies the location of the parcels and their proximity to the nearest highway and landfill.

Step 2: Define the Solid Waste Generators Within the Planning Area.

Examine all of the residential, commercial, and municipal solid waste (MSW) generators in your planning area (e.g., homes, tribal government buildings, schools, restaurants, casinos, health care facilities). Also, determine whether you will have to handle solid waste from illegal dumping sites. The St. Regis Mohawk Tribe in New York identified 100 businesses in the community. Time constraints limited the number of waste audits the tribe could conduct, so the tribe took a representative approach—classifying businesses into different categories and selecting 10 percent of the businesses in each category for a waste audit.

Step 3: Identify Existing Waste Management Practices Within the Planning Area.

Where is waste going now? Are individuals or community organizations reusing or recycling products or materials? Identify any significant amounts of waste entering and leaving the reservation. Don't forget to include waste left from illegal dumping or litter. Many tribal members use burn barrels and backyard dumps for waste disposal; your community outreach program can help you identify this portion of your waste stream.

Step 4: Conduct a Waste Assessment/Waste Audit.

Characterizing the solid waste requiring management in your tribal community is the backbone of the whole planning process. The St. Regis Mohawk Tribe in New York used volume-based estimates to determine the waste generated by the residential and commercial sectors. Using information from both the waste collectors and generators, along with visual inspections of waste materials, the tribe quantified the waste composition. Your tribe might need to determine the quantity and composition of your waste to evaluate your options and estimate their costs. Quantity information can include both the weight and volume of your waste, and a composition analysis can tell you what products and materials make up your waste stream. If incineration is an option, you also will need to estimate the energy content of your waste stream to ensure you are generating sufficient waste for effective burning. Information on your waste is collected through a process called a waste stream analysis, discussed later in this chapter.

Step 5: Estimate Future Waste Generation Quantities.

Estimate future waste quantities using the projected growth information you gathered in Step 1 for the established planning period. These are the quantities that will be used to size facilities and estimate long-term waste management costs.

Step 6: Develop Waste Handling Options.

Once you have a good picture of your current situation, start looking at the waste management options available. What percentage of discards can be prevented, reused, reduced, or recycled? How will you dispose of everything else? Does the tribe collect residents' discarded materials, or will members have to take them to a transfer station or disposal facility? A discussion of source

Example of Estimating Future Waste Generation Quantities

The Makah Tribe of Indians in Neah Bay, Washington, had a population of 1,500 in 2002, with an estimated population growth rate of 1.1 percent per year. The planning period is 20 years, and the waste generation rate is 3.7 pounds per person per day (determined through an actual waste stream assessment by the tribe) for the 20-year period.

To determine how much waste it would generate in 2002, the tribe made the following calculation:

Equation 1: (population) x (waste generation rate) x (number of days per year) ÷ (number of pounds per ton)

(1,500 people) x (3.7 lbs/person • day) x (365 days/year) ÷ 1 ton/2,000 lbs = 1,013 tons/year

Rounding up, the tribe estimated it would generate approximately 1,020 tons of solid waste in 2002.

Based on a constant growth rate of 1.1 percent per year and using a simple compound interest equation, the Makah Tribe's population will be approximately 1,866 in 2022

Equation 2: $P(1 + r)^{T}$ where: P = initial population = 1,500 people
r = percent growth rate/100= 1.1/100 or 0.011
T = years= 20 years

$$1{,}500(1 + 0.011)^{20} = 1{,}866 \text{ people}$$

Using Equation 1 again, the tribe calculate that these 1,866 people will generate 1,260 tons of waste during the year.

(1,866 people) x (3.7 lbs/person • day) x (365 days/year) ÷ 1 ton/2,000 lbs = 1,260 tons/year

The easiest way to determine the total amount of waste generated over this 20-year period is to set up a spreadsheet, similar to the one depicted in Figure 2, that tracks the tribe's population and waste generated increases year by year. Summing the annual waste generated amounts from 2003 through 2022 shows that a total of 22,802 tons of waste will be generated during this time period.

Using these projected waste quantities in its planning process, the Makah Tribe would know that a transfer station would need to be large enough to accommodate the 1,260 tons of waste expected in 2022, while a landfill would need to be large enough to hold the 22,802 tons generated during this 20-year period.

Figure 2. Population and Waste Generation Spreadsheet

Year	Population	Annual Waste Generation (Tons)
2002 (base year)	1,500	1,013
2003 (year 1)	1,517	1,024
2004 (year 2)	1,537	1,037
2005 (year 3)	1,554	1,049
2020 (year 18)	1,830	1,235
2021 (year 19)	1,847	1,247
2022 (year 20)	1,866	1,260
20-year Total	—	22,802

reduction, recycling, and composting is presented in Chapter 5. Waste collection and disposal options are presented in Chapter 4.

Step 7: Identify Existing Regional Programs or Infrastructure That the Planning Area Might Use.

When evaluating the potential benefits of developing or participating in regional programs, the following questions should be answered: Where is the closest permitted landfill? Do other tribes in your region export their waste? Is there an opportunity to combine your efforts and share certain resources? What types of collection and disposal programs does the county or state currently run? Does the county or state hold annual household hazardous waste collection events near your tribe?

Planners and managers involved in solid waste management usually find that it is beneficial to participate in regional solid waste advisory committees or work groups to gain an understanding of how others are dealing with their challenges. Often, tribes involved in regional partnerships can use their increased size and associated bargaining power to gain economic advantages. In the Prince William Sound regions of Alaska, for example, seven Native villages and two Alaska Native Claims Settlement Act corporations have formed the Nunagpet/Chugachmiut Environmental Consortium. This coalition covers all aspects of environmental protection for the region, supporting solid waste management and recycling efforts. Most recycling revenue is used to cover transportation costs; it takes the commitment of the member villages to keep the program viable.

Step 8: Develop Costs for Waste Handling Options.

Once a tribe has compiled information on the quantity and composition of its waste stream, planners and managers can develop options and associated costs for solid waste handling and disposal. Cost estimates should include both capital costs and operation and maintenance costs for the facilities for each option. Capital costs include costs to design and construct new facilities and purchase equipment. Operation and maintenance costs are those necessary for the day-to-day operation of the solid waste management system and include employee salaries, employee benefits, utility costs, equipment fuel, equipment maintenance, and other expenses related to handling and disposing of the materials in the waste stream.

Step 9: Compare Options Based on Criteria Defined by the Tribe.

Look to your goals to help you develop the criteria for comparing options, and prioritize your criteria. Some common criteria include:

- Environmental impacts
- Relative cost
- Potential to create jobs in the tribe
- Operation and maintenance challenges
- Regulatory requirements
- Degree of tribal control
- Cost of closure, post-closure care, and financial assurance for municipal landfills

The Metlakatla Indian Community, a community of 1,600 residents located on the Annette Islands Reserve in southeast Alaska, developed a solid waste management plan in 1999 with funding from an EPA grant. The community had to address many of the issues faced by tribes today, including its remote location, open dumping, lack of infrastructure, and competing environmental concerns. The plan includes the results of a waste stream analysis, a discussion of solid waste management options and costs, and a list of the criteria used to evaluate sites for waste handling facilities.

When and How To Use a Consultant

Most tribes and Alaskan Native villages have found that they do not need a consultant to develop their solid waste management plans. Tribes and Native villages already possess or are able to obtain most of the information needed for developing a plan. Additional information and resources are available to tribes and Native villages free of charge through federal agencies such as EPA, other tribes and villages, tribal and regional associations, or state environmental agencies.

Some tribes and villages have hired consultants to help them develop solid waste management plans. These consultants helped organize the planning process, provided technical assistance, facilitated planning sessions, and in some cases, wrote the plan. While consultants often do have expertise in developing plans in general, they still do not have as much expertise and knowledge of your tribe or village as a tribal member does. The consensus among many tribes and Alaskan Native villages is that tribes and villages possess enough expertise and knowledge and have access to enough free resources to develop a basic solid waste management plan without hiring outside consultants.

When the time comes to implement your solid waste management plan, you might find that obtaining the help of a consultant is necessary. Designing and building a landfill, transfer station, or recycling center, for example, will require the expertise of a trained and certified engineer. If your tribe or village does not have this expertise in-house, hiring a consultant is one method of obtaining it. Contacting IHS or your state environmental agency and asking the agency to provide an engineer is another potential option.

To find a qualified consultant, contact your regional EPA office, IHS, or the Bureau of Indian Affairs (BIA). These agencies can usually provide the names of several consultants that offer professional engineering and consulting services to tribes. Another place to look is in tribal newspapers and publications, such *Indian Times, Indian Country Today,* or *American Indian Report*. You can also check with other tribes and villages to ask for references and recommendations for consultants they have worked with in the past.

Before hiring a consultant, ask for a statement of qualifications and references from former clients. If it is a large project, or if it is being performed through an EPA grant, a formal award process might be necessary. This involves fully describing your technical need, advertising the requirement, and requesting and reviewing several consultants' technical and cost proposals. These need to specifically state what, where, when, and how the work will be done. The technical proposal needs to address past performance, including references from clients. Always check their references.

The Alaska Native Health Board's (ANHB) *Solid Waste Management & Planning for Rural Communities in Alaska* provides helpful tips on using consultants effectively while maintaining control over your solid waste management decisions. Some of these tips include:

- Only ask a consultant to prepare parts of your solid waste management plan that no one else in your community or agency can do for you, or to provide technical/engineering expertise that you can not provide internally.
- Have a get-acquainted meeting. Make sure the consultant understands your needs and exactly what you want.
- Encourage the consultant to ask questions about your community; this will ensure that you receive a plan or design that meets your tribe or village's specific needs and situation.
- Ask your consultant for suggestions, and carefully weigh the advice. Accept advice, not direction.

Conducting a Waste Stream Analysis

"Know your waste stream. A waste assessment provides information about potential recycling opportunities and helps you choose a transfer station design."

~Calvin Murphy,
Eastern Band of Cherokee Indians

As discussed in Step 4, conducting a waste stream analysis or audit will lay the foundation for your planning process. A waste stream analysis helps estimate the amount of solid waste generated within a planning area. The process involves compiling reliable information on the types and quantities of solid waste being generated. The weight or volume of materials and products that enter the waste stream are measured before any recycling, composting, burning, or landfilling takes place. For example, in 2001 the U.S. waste generation rate was 4.4 pounds of discards per person per day. In rural areas, however, the generation rate is commonly lower. The St. Regis Mohawk Tribe, for example, determined its waste generation rate to be 1.5 pounds per person per day. Conversely, Alaskan Native villages tend to be above the national average. According the Alaskan Native Health Board's *Solid Waste Management & Planning for Rural Communities in Alaska*, the average Alaskan generates 6 pounds of waste per day. The Tribal Association of Solid Waste and Emergency Response (TASWER) and the Solid Waste Association of North America's (SWANA) joint training course guide, *Developing and Implementing Integrated Solid Waste Management Systems for Tribal Nations*, provides several approaches to estimating tribal waste generation rates.

A waste stream analysis will give you the information you need to answer questions such as: How much of your waste can be recycled? and, What percentage will require disposal? It gives your tribe the data it needs to develop an effective solid waste management plan.

Purpose and Outcome of a Waste Stream Analysis

What solid waste management goals has your tribe developed during the planning process? A tribe's goals dictate the information and accuracy needed in a waste stream analysis. A tribe that is interested in the economic benefits of recycling might want to determine the quantities of higher-valued materials (such as aluminum cans) it generates. On the other hand, a tribe that is interested in preserving landfill space might need to know the quantities of all materials it generates that it can reduce. Source reduction and landfill projects require knowledge of gross waste volumes. Recycling and waste-to-energy programs require knowledge of the quantity and composition of wastes, not only for value of the material, but also for sizing storage and handling areas.

The Eastern Band of Cherokee Indians in North Carolina conducted a weight-based waste assessment. The tribe's Public Utilities Department randomly selected 212 houses and several businesses to participate in the study. Department staff visited each participant to obtain consent and explain study procedures. For a specified period of time, participants placed all of their solid waste and recyclable materials in special garbage bags. At the end of the study period, department staff collected the bags and separated the waste by hand, weighing paper, food scraps, and glass separately. The tribe used the waste assessment data to estimate its waste generation rates and identify recycling opportunities. For example, the study revealed that homes and businesses generate large quantities of cardboard. The tribe found a market to sell its recovered cardboard to make money

to support other, less profitable, recycling activities.

Methods of Conducting Waste Stream Analysis

Two basic approaches a tribe can use to analyze its waste stream are 1) desktop estimates and 2) field surveys. The desktop estimate uses existing data to quantify the amount of waste generated. A desktop estimate will provide a first-cut estimate. Existing data can come from your state, or a nearby county, city, or tribe. Table 1 provides the average densities of common waste categories that might also prove useful in making initial estimates. Many tribes use the EPA national generation rate and characterization data for their first-cut estimate. Visit the EPA Web page for the most current update of *Municipal Solid Waste In the United States: Facts and Figures*. Keep in mind, however, that tribes and other communities in rural areas often generate less waste per capita than the amount reflected in EPA's numbers. For example, for 2001, EPA reports the per capita waste generation rate to be 4.4 pounds per person per day, while the Makah Tribe of Indians, referenced earlier in this chapter reported a rate of 3.7 pounds per person per day in waste generation. Conducting a field survey will provide you with more tribal-specific data.

Desktop estimates can use an average generation rate or a more sector-specific generation rate. Both approaches use generation rate (pounds per person per day) multiplied by population (number

Table 1. Average Waste Densities

Waste Type	Density of uncompacted waste (pounds/yard^3)
General household waste (organic and inorganic wastes including food wastes, paper, cardboard, plastics, textiles, rubber, leather, wood, aluminum, tin, other metal, glass, dirt, and ashes)	
Uncompacted	150-300
Compacted	500-1,000
Large metal scrap (depending on metal type)	750-3,000
Mixed wood, plastic, metal waste	150-300
Miscellaneous plastics	70-120
Commercial waste (uncompacted)	300-600
Special wastes	
Tires (non-shredded)	45-110
Furniture (large, e.g., couches, armchairs)	75-400
Refrigerator	160-280
Other appliances (white goods)	230-340
Automobiles	1,000-5,000 lbs/vehicle
Yard and agricultural wastes	
Yard trimmings (e.g., tree trimmings, brush, leaves)	100-300
Grass clippings	500-1,000
Agricultural wastes (mixed)	675-1265
Dead animals	605
Fruit or vegetable waste	605
Construction and Demolition Debris	
Wood (unstacked)	180-350 (well stacked wood is 2 to 4 times larger)
Broken concrete	2,020-3,035
Mixed construction	305-605
Mixed demolition (non-combustible)	1,685-2,695
Mixed demolition (combustible)	505-675

Source: TASWER and SWANA. *Developing and Implementing Integrated Solid Waste Management Systems for Tribes.* Spring 2003, pp. 41 & 66.

of residents or employees). Using generation rates from a community of similar size will improve the reliability of the estimate. The sector estimate uses generation rates for different generators, then combines the data to derive the total generation rate. EPA's *Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities* lists waste generation rates for 30 urban, suburban, and rural communities discussed in the report. Your tribe might be able to use one of these generation rates from a similar size community for a desktop estimate.

The Spokane Tribe of Indians in Washington state used desktop methods to estimate its volume and tonnage of waste. The Tribal Solid Waste Program did not keep track of the waste managed through its collection and landfill services. The tribe derived estimates using a combination of state-wide averages, observations by the collection employee, billing records for commercial accounts, and general demographic data. The tribe developed separate estimates for the waste stream from the collection service, the commercial accounts, and the commercial accounts not serviced by collection. Then they combined these three estimates for a reservation-wide estimate.

Field surveys can help you obtain a more accurate measure of your waste stream. Three tasks are required to develop reliable data—planning, execution, and data analysis. The importance of planning cannot be overemphasized. Planning considerations include determining what type and how much waste is generated in the area and what equipment and personnel are available, and calculating bias factors.

Several approaches are available for executing the field survey. One is a field weighing program, where tribal staff or contractors weigh all vehicles entering the landfill, or a randomly selected subset. The other is a field composition study, where tribal staff determines the composition of the waste stream by sorting and weighing individual components. A brief overview of the steps to perform a field waste sort follows:

1. Obtain a guide on how to perform a field waste sort and talk to other tribes that have performed a waste sort.
2. Decide whether you want to conduct the waste sort in-house, using tribal staff, or whether you want to hire an outside contractor.
3. Define the waste categories to be sampled. Based on your tribal community's goals, select the components you will use for the field sampling.
4. Select containers for the waste components. Make sure containers are of a manageable size for weighing. A 55-gallon container filled with glass can weigh between 200 and 500 pounds. The size and weight capacity of the scale you will be using also will influence your container choices.
5. Determine the number of samples and the physical sizes of the samples. Consider the following factors: the consistency of the waste stream, the amount of solid waste delivered to a facility by the different generators, and the number of vehicles delivering solid waste to the facility each day. Sampling 10 percent of the vehicles using the facility (daily or weekly) is a good guide.
6. Arrange for a crew and set up the equipment.
7. Sort and weigh the waste, recording weight on category forms.
8. Compile and analyze the data.

Estimating Composition and Quantity of Solid Waste Generation, by the National Environmental Training Center for Small Communities, provides technical guidance

for performing a waste stream analysis. The guide has worksheets and checklists for both desktop and field surveys. For a less technical approach, consult *Counting Your Community's Trash*. This two-page fact sheet provides an overview for small communities on how to calculate the materials in the residential waste stream.

The St. Regis Mohawk Tribe Environment Division's *Solid Waste Handbook* provides examples of two different approaches to field surveys. Appendix B of the *Solid Waste Handbook* describes in detail how the St. Regis Mohawk Tribe performed a volume based waste audit, while the Eastern Band of Cherokee Indians in North Carolina performed a weighted-based audit. The *Solid Waste Handbook* also provides a link to a waste audit manual.

Potential Bias Factors

Accounting for potential bias factors that can affect the estimates of waste generation rates is important. Seasonal variations account for most of the potential bias. The quantity of waste generated in any area will vary from month to month. Lack of yard trimmings in the winter months reduces the amount of residential waste. Retail wastes are higher during peak sales periods like Christmas. School-related wastes decrease during the summer. Tourism causes variations in population and types of waste, which impacts waste generation. Work force fluctuations affect population and also waste types and quantities generated. Subsistence activities can generate specific types of waste only at certain times of the year.

To help control potential bias factors caused by the increased population during tourist season, the Eastern Band of Cherokee Indians, for example, conducted its waste sort twice, once during the height of tourism season and once during the tourism low point.

The St. Regis Mohawk Tribe collecting waste as a part of its waste stream analysis.

Chapter Highlights

- Prepare a solid waste management plan as the first step in developing a solid waste management program. It is the foundation upon which you will build your tribe or village's program.
- Use your solid waste management plan to define, prioritize, and focus your tribe or village's solid waste management goals.
- Conduct a waste stream analysis to understand the types and amounts of waste your tribe or village generates.
- Complete your solid waste management plan before applying for federal solid waste grants. Many grant programs place a premium on having a solid waste management plan—for a few it is even a prerequisite.
- Revisit and update your solid waste management plan as your program develops and as your tribe or village's solid waste-related goals change.

Resources

EPA's *Decision-Maker's Guide to Solid Waste Management, Second Edition* (EPA530-R-95-023), available on EPA's Web site at <www.epa.gov/epaoswer/non-hw/muncpl/dmg2.htm> or by contacting the RCRA Call Center at 800 424-9346.

EPA's *Solid Waste Management: A Local Challenge with Global Impacts* (EPA530-F-02-026), available on EPA's Web site at <www.epa.gov/epaoswer/non-hw/muncpl/ghg/f02026.pdf> or by contacting the RCRA Call Center at 800 424-9346.

EPA's *Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities* (EPA530- R-92-015), available on EPA's Web site at <www.epa.gov/epaoswer/non-hw/reduce/recy-com/ toc.pdf> or by contacting the RCRA Call Center at 800 424-9346.

Estimating Composition and Quantity of Solid Waste Generation, by the National Environmental Training Center for Small Communities. Available by calling 800 624-8301 or through the Center at <www.nesc.wvu.edu/netcsc/pdf/NETCSC2000catalog.pdf>.

Counting Your Community's Trash, available on the Web at <www.zender-engr.net/docs/counting_trash_final.pdf>.

St. Regis Mohawk Tribe-Environment Division's *Solid Waste Handbook* available at <www.srmtenv.org/ swhandbk.pdf>.

Developing and Implementing Integrated Solid Waste Management Systems for Tribal Nations: A Training Course Prepared by the Tribal Association for Solid Waste and Emergency Response (TASWER) and the Solid Waste Association of North America (SWANA), Spring 2003. Contact TASWER <www.taswer.org> or SWANA <www.swana.org> for more information.

Solid Waste Management & Planning for Rural Communities in Alaska: Community Resource Guide & Planning Workbook, Draft 2003. By the Alaskan Native Health Board. Contact your ANHB contact for more information.

7 Generations: Addressing Village Environmental Issues for the Future Generations of Rural Alaska, March 1999, available on the Web at <www.state.ak.us/local/akpages/ENV.CONSERV/dsps/compasst/7generations/7gen.htm>.

Regular updates of *Municipal Solid Waste In the United States: Facts and Figures*, available on EPA's Web site at <www.epa.gov/epaoswer/non-hw/muncpl/ msw99.htm>.

Solid Waste Disposal Facility Criteria (EPA530-R-93-017), November 1993, available on EPA's Web site at <www.epa.gov/epaoswer/non-hw/muncpl/landfill/techman/index.htm>or by contacting the RCRA Call Center at 800 424-9346.

Sample Solid Waste Management Plans

The Inter Tribal Council of Arizona, Inc., *Model Tribal Solid Waste Management Code*, available on the Web at <www.epa.gov/tribalmsw/pdftxt/itc10746.wpd>, includes information on how the tribe developed its solid waste management plan.

Solid Waste Management Plan for the Hannahville Indian Community, available on the Web at <www.epa.gov/ tribalmsw/pdftxt/hanplan.pdf>.

Solid Waste Handbook, by the St. Regis Mohawk Tribe of New York, available on the Web at <www.srmtenv.org>.

Description of the Metlakatla Community Integrated Waste Management Plan, available on the Web at <www.ridolfi.com/Annette/IWMP.index.html>.

Chapter 3. Developing, Implementing, and Enforcing Solid Waste Codes, Laws, and Regulations

A number of tribes and Alaskan Native villages have adopted codes, laws, or regulations to address solid waste management issues. Some have well-established regulatory programs they are actively implementing and enforcing. The majority of tribes, however, currently have no, or very limited, formal solid waste regulations. Most tribes are aware of the value of solid waste management codes, laws, and regulations but have lacked the financial resources to develop and implement them. Today, many tribes are at the point of considering whether developing a solid waste regulatory program is a feasible or desirable approach for addressing their waste management needs.

Your tribe or village might want to develop solid waste management codes, ordinances, or regulations for a number of reasons. These might include promoting tribal waste management goals, protecting public health and the environment, or protecting natural resources. Solid waste codes are a formal legal method of promoting or preventing behaviors, such as recycling or open dumping respectively. One thing to consider when developing your codes is if voluntary waste management standards are sufficient to meet your tribe's needs, or if formal regulations are necessary. Also, consider which waste management issues will always need a code, such as preventing open dumping, and which issues might change over time, such as recycling standards.

In contrast to many federal and state waste management programs, many tribes rely primarily on non-regulatory measures and use regulatory measures as a last resort. This chapter can help you determine whether a regulatory, non-regulatory, or combination approach will best meet your solid waste management needs. Because many tribes are still in the process of considering whether to develop solid waste codes and regulations, the emphasis of this chapter is on these early stages.

Establishing a tribal solid waste regulatory program typically involves three main steps: 1) code development, 2) implementation, and 3) enforcement. This chapter addresses each of these steps and suggests issues to consider at each stage.

Examples of language from several tribes' solid waste codes are interspersed throughout this chapter. Complete reference and ordering information for these and additional tribal codes, model code templates, and other guidance documents are included in the Resources section at the end of this chapter.

Developing a Solid Waste Management Code

When developing a solid waste management code, you might identify the need for a regulatory program, define the scope of regulations, and draft the regulations. Some tribes have the resources to develop a comprehensive solid waste code. If your tribe is limited by funding, staffing, or time and is unable to develop and adopt comprehensive solid waste regulations, developing codes or regulations that address a single priority issue, or a few select issues, might be a more viable approach. The number, complexity, and importance of waste management issues can differ significantly among tribes, and therefore the approach taken in developing a regulatory program will vary from tribe to tribe.

Identifying and Prioritizing Waste Management Issues

The first step in determining the type of regulatory approach that best meets your needs is identifying and prioritizing your tribe's waste management issues. The tribal community, staff, and governing body all can help identify and prioritize key issues. Government officials and residents in surrounding jurisdictions that share common waste management concerns also might be involved. Although specific issues and priorities are likely to differ among tribes and Alaskan Native villages, they share a number of waste management concerns, including:

- Open dumping
- Cleanup and closure of open dumps
- Open burning
- Abandoned vehicles and vehicle-related wastes
- Abandoned large appliances/white goods
- Construction and demolition waste
- Facility siting and permitting

Open Dumping

Open dumping refers to the depositing of solid waste anywhere (on land or in water) other than an approved solid waste facility. This practice is one of the most prevalent waste management concerns for tribes, and most tribal solid waste codes include a prohibition against open (or "wildcat") dumping.

Open dumps can leak hazardous leachate into the groundwater and streams, contaminating drinking water supplies or negatively affecting commercial or subsistence fishing. In areas with high amounts of rainfall, this leaching process can happen quickly. Also, open dumps attract scavenging wild animals and insects that spread disease.

To address the problem of open dumping on tribal lands, the Fallon Paiute-Shoshone Tribe of Nevada adopted an Open Dump Ordinance, with the following purpose:

"The tribe is enacting this ordinance to provide a process and standards for the prevention of open dumps within tribal lands or adjacent boundaries. The tribe is compelled to act because of the threat open dumps pose to the environment, health, safety, and economic security of the tribe and its members. In particular, open dumps present a significant threat to the quality of groundwater and surface water resources. In order to protect the tribe's limited natural resources, the tribe is required to address the threat posed by open dumps through the exercise of its inherent sovereign power and constitutional authority to protect and preserve the tribal health, safety, welfare, customs and traditions, lands and environment."

Cleanup and Closure of Open Dumps

Even when a tribe eliminates open dumping, the wastes that remain at historic open dump sites can continue to adversely impact tribal health and resources. To prevent this, your tribe can develop a solid waste management regulation that addresses environmental

standards for cleaning up and closing an open dump site.

A Waste Management Ordinance adopted by the Metlakatla Indian Community in Alaska directed the community's Environmental Office to develop regulations for cleanup and closure of open dumps, illegal disposal sites, and other contaminated sites on the Annette Islands Reserve in Southeast Alaska. The Metlakatla Indian Community Council subsequently developed and approved these regulations, which serve as the basis for ongoing cleanups conducted by various federal agencies.

Open Burning

Open burning refers to the burning of solid wastes in a simple container or pile. In some areas, waste burning occurs at relatively large open dump sites, and in other areas it occurs on a much smaller scale, such as in backyard burn barrels. Some tribal codes include a prohibition on all open burning, while others allow open burning of specific wastes, such as yard trimmings, agricultural waste, or wood construction debris. Open burning of solid waste at municipal solid waste management facilities is prohibited by the Resource Conservation and Recovery Act (RCRA) (see 40 CFR Parts 258.24(b) and 257.3-1) except in limited cases. Many states and counties prohibit the burning of household trash on private property as well.

Open burning increases community exposure to pollutants that can have an adverse impact on human health and the environment. Smoke from open burning can exacerbate existing respiratory conditions, such as asthma and emphysema. Children, the elderly, and individuals with other preexisting respiratory conditions are especially vulnerable to these effects. Open burning also can spread toxins throughout the atmosphere, onto land and water and into the food chain. Hazardous pollutants released by open burning of waste include dioxins, particulate matter (fine particles), lead, mercury, sulfur dioxide, nitrous oxides, and hexachlorobenzene and other volatile organic compounds (VOCs) (many of which are known carcinogens). Because the remaining ash can contain dangerous levels of toxic metals such as mercury, lead, arsenic, and chromium, care should be taken in disposing of the ash.

Before and after photographs of an illegal dump on the White Earth Band of Chippewa's land.

The Walker River Paiute Tribe in Nevada drafted a Solid Waste Burning Prohibition

Backyard burning of household waste in burn barrels is a problem nationwide, not just in Indian country.

Ordinance to address the problem of burning solid waste in open dumps and at other sites within the exterior boundaries of the Walker River Indian Reservation. The tribe deemed development of this ordinance necessary "because of the particular threat the burning of solid waste poses to the environment, economic security, health, and welfare of the Walker River Paiute Tribe, its members, and all residents of the reservation," and also because "burning solid waste in the open dumps and at other sites located on the reservation presents a significant threat to the quality of the air resource on the reservation."

Abandoned Vehicles and Vehicle-related Wastes

Abandoned vehicles and vehicle parts are such a prevalent waste management concern for many tribes that they are specifically included in the definition of solid waste in many tribal codes, as well as in some state and municipal codes. In addition to the vehicles themselves, vehicle-related wastes (including tires, batteries, used oil, and antifreeze) might be a concern.

Most of the health and environmental hazards related to tire disposal are caused by long-standing stockpiles of tires. Air pockets in tires provide convenient habitats for rodents. They also hold water, which provides an ideal breeding ground for mosquitoes that transmit infectious diseases. Stockpiled tires also pose fire hazards. Burning stockpiles are difficult to extinguish, because air pockets trap oxygen that feeds the flames. When they burn, tires emit a noxious black smoke. The remaining oils

Abandoned vehicle and parts in Kokhanok Village (Alaska).

and soot can run off and contaminate groundwater.

The Open Dump Ordinance adopted by the Fallon Paiute-Shoshone Tribe in Nevada expressly prohibits the dumping of "used motor vehicle tires, motor vehicle batteries, motor vehicle oils or fluids." The Cheyenne River Sioux Tribe, located in South Dakota, has established specific service fees for collecting and disposing of automobiles, pickup trucks, utility trailers, and trucks according to a fee schedule in the tribe's Solid Waste Ordinance.

White goods recycling pile at the Kokhanok Village (Alaska) landfill.

Abandoned Large Appliances/White Goods

Your tribe might find it needs codes or regulations to address disposal of large appliances and white goods. If not disposed of properly, large appliances can easily become eyesores in your community. The Stockbridge-Munsee Nation of the Mohican Band in Wisconsin has a Tribal Solid Waste Management Ordinance that specifically states that discarded appliances are not accepted for collecting, and their disposal is the responsibility of the owners. Other tribes, such as the Eastern Band of Cherokee Indians and Jicarilla Apache Nation accept white goods at their transfer stations for scrap metal recycling.

Construction and Demolition Debris

Several tribes have experienced difficulties in managing construction and demolition (C&D) debris. The size and weight of these wastes makes their disposal with normal household waste very expensive. Since C&D debris typically contains inert materials such as concrete, brick, asphalt, and non-hazardous materials such as wood, sheetrock, or plaster, it can be disposed in special C&D, or inert waste, landfills. Since these landfills typically do not need to be lined, tipping fees are much lower than at a Subtitle D-compliant landfill. Several tribes have established management standards, either formally through codes or informally through other policy mechanisms, to manage C&D debris separately.

The Assiniboine and Sioux Nations of the Fort Peck Reservation in Montana, for example, were having troubles with private contractors filling up roll-off containers at their five household waste drop-off sites. Fort Peck's Operations and Maintenance (O&M) Department was stuck paying high tipping fees at a municipal landfill to dispose of this C&D debris. Going through its Public Works Committee Board, O&M received authorization to manage C&D debris separately in designated containers and request that contractors rent dumpsters directly from O&M. Separating its C&D debris from its municipal waste allowed O&M to ship the C&D debris to a C&D landfill with much lower tipping fees.

Facility Siting and Permitting

Some tribes choose to locate solid waste facilities, such as landfills or transfer stations, on tribal lands. When appropriate, tribal regulations might include criteria for siting, permitting, and operating these facilities. An

ordinance adopted by the Cheyenne River Sioux Tribe in South Dakota designates the Cheyenne River Sanitary Landfill for temporary or permanent disposal of garbage and waste materials in the community of Eagle Butte. Additionally, the Rosebud Sioux Tribe of South Dakota has adopted landfill location, design, and operation standards as part of its Solid Waste Code.

After you have identified and prioritized the important waste management issues for your tribe, you will need to decide whether you want to address any or all of these issues through codes or regulations. Involving tribal members at this stage is critical to ensuring that the issues identified as needing some form of regulation are truly the issues important to the tribe.

Public involvement at this step also will help you understand how a regulatory program will potentially affect and benefit tribal members. Tribal members are much more likely to respect and follow tribal ordinances when the tribe has gone through an open and fair adoption process. Tribal members' involvement at this stage also will help staff draft regulations that are consistent with and promote tribal cultural values and traditions.

Ensuring Consistency and Coordination with Federal Regulatory Programs

Tribal governments, as well as the federal government, are responsible for regulating the environment and protecting the health, welfare, and resources of tribal members on reservations and other tribal lands. In carrying out these responsibilities, some tribes have developed waste management regulations as a part of their inherent sovereign authority. Once you identify and prioritize your tribe's waste management issues, you can identify what federal regulatory programs are already in effect to address your tribe's waste management concerns and how developing tribal regulations can build upon those existing programs.

The primary federal law governing solid waste is the Resource Conservation and Recovery Act (RCRA). Enacted by Congress in 1976, RCRA's main goals are to protect human health and the environment from the potential hazards of waste disposal, conserve energy and natural resources, reduce the amount of waste generated, and ensure that wastes are managed in an environmentally sound manner. One approach to developing your solid waste regulations is to write them in a manner that is consistent and coordinates with federal regulations. The Lac du Flambeau Tribe of Wisconsin, for example, uses compliance with the federal RCRA regulations as a requirement for issuance of a solid waste facility permit under its Solid Waste Code.

Another approach to developing your solid waste codes and regulations is to write them so that they are consistent with your tribe's culture. The St. Regis Mohawk Tribe in New York wrote its solid waste codes from the tribe's cultural perspective to help tribal members better understand and relate to the issues. For example, the St. Regis Mohawk Tribe's Solid Waste Management Code uses education as its first and primary enforcement tool, resorting to fines or penalties only as a last recourse.

Waste management practices that directly or indirectly impact groundwater, surface water, and air resources on tribal lands also can be subject to federal regulatory requirements. In addition to a tribe's inherent regulatory authority, certain federal regulatory programs, including the Clean Water Act, the Clean Air Act, and the Safe Drinking Water Act also are applicable to tribes. Until tribes apply for and are authorized to operate a regulatory program under these statutes, EPA is responsible for implementing federal regulations on tribal lands. Whether or not your tribe pursues authorization under any of these regulatory programs, opportunities exist for your tribe to receive financial assistance, technical

Descriptions of major federal environmental regulations can be found in the glossary of this guide.

assistance, or cooperative enforcement that can help you in your efforts to address impacts from waste management. For more information on financing your waste management program, refer to Chapter 7.

Drafting Tribal Codes

Although tribal regulations differ significantly from one another in their scope and complexity, they generally include the following elements:

- **Purpose and Scope**
  The purpose and scope of the codes typically discuss why the tribe developed the regulations, who is subject to the regulations, where the regulations apply, and what activities are covered by the regulations.
- **Definitions**
  This section of the code will define terms that are important in understanding, implementing, and enforcing the regulations.
- **Program Requirements, Procedures, or Standards**
  Program requirements, procedures, and standards typically describe how the tribe will carry out regulations and might include waste management procedures, permitting and operating requirements, and prohibitions.
- **Enforcement**
  The enforcement section typically includes a schedule of fees or penalties for violating the requirements contained in the regulations and might include other enforcement mechanisms and authorities.
- **Administration**
  This element typically identifies the responsibilities and procedures for implementing, revising, and/or updating the regulations.

The Rosebud Sioux Tribe of South Dakota adopted a Solid Waste Code with the following statement of purpose:

1. *Provide environmental and health standards for the collection and disposal of solid waste;*
2. *Prohibit future open dumping and littering of waste on the reservation and eliminate unhealthy, unsightly, and indiscriminate disposal or placement of solid waste; and*
3. *Inform and educate persons living on the reservation of the need to participate fully in efforts to manage solid waste generation, transportation, and disposal on the reservation.*

The Fort McDowell Yavapai Community of Arizona adopted a Waste Ordinance as part of its Environmental Code for the following purposes:

1. *Promote the health and safety of tribal members and all other persons within the exterior boundaries of the nation and other lands within the jurisdiction of the tribe;*
2. *Promote the cultural, social and economic stability of residential, agricultural, commercial, industrial, forest, riparian, and environmentally sensitive lands within the nation and other lands within the jurisdiction of the tribe;*
3. *Contribute to the protection of the historical and cultural values and traditions of the tribe, the nation as a permanent tribal homeland, and the aboriginal character of the nation;*
4. *Minimize air, water and land impacts from solid and hazardous waste pollution, including contamination of the tribe's aquifers,*

groundwater, surface waters, drinking water supplies, and all other natural resources;

5. *Enhance standard of living, quality of life, welfare and well being of all persons within the exterior boundaries of the nation and other lands within the jurisdiction of the tribe;*

6. *Provide and promote tribal environmental protection and services within the nation, and to regulate environmental activities under principles of tribal sovereignty; and*

7. *Implement, regulate, and enforce environmental standards and criteria, orders and permit conditions, and laws and regulations under the ordinance, for the sanitary storage, collection, transportation, and disposal of all solid waste within the exterior boundaries of the nation and other lands within the jurisdiction of the tribe.*

Implementing a Solid Waste Management Code

Once your tribe drafts and adopts codes or regulations, your next step is to implement them. To effectively implement a regulatory program, tribal members will need to understand the specific requirements of the regulations, as well as why it is important to follow the regulations. They should understand the benefits of compliance and the consequences of non-compliance. For more information on developing a tribal solid waste management education and outreach strategy, refer to Chapter 6.

The two areas of regulatory program implementation discussed in this section are:

- Supporting and sustaining the regulatory program.
- Coordinating the regulatory program with other, non-regulatory waste management efforts

Supporting and Sustaining a Regulatory Program

Developing, implementing, and sustaining a successful regulatory program requires not only financial and technical resources, but also might require approval from tribal members. Coordination with local or state governments often is important as well.

Financial Support

Determining how to adequately fund a long-term regulatory program can be a major challenge for tribes. You might need to determine if you will fund the program through internal sources, such as by charging user fees at solid waste facilities or by assessing penalties for violating solid waste regulations. Additionally, outside funding sources might support and sustain the costs of program development. You might use some combination of funding sources to set up a regulatory program that meets your tribe's needs and goals over the long term.

Unfortunately, lack of adequate funding often is the primary limiting factor in a tribe's ability to develop and implement regulatory, as well as non-regulatory, waste management programs. Your tribe can consider the anticipated cost of developing and implementing regulations, and its ability to support those costs, when determining the best regulatory approach. Your tribe also will need to consider the costs associated with building or using a landfill, transfer station, or other facility. For more information on funding a solid waste management program, refer to Chapter 7.

Technical Support

In addition to financial support, technical support—including access to regulatory, technological, and economic guidance—will help your tribe develop, implement, and sustain its regulatory program. Technical resources are available via the Internet or

other electronic formats (such as CD-ROM), in hard copy, or through access to technical assistance and expertise. Other potential sources of technical support include federal, state, or local agency staff; other tribes; tribal organizations; consultants; or other waste management organizations.

Tribes wanting to start up an integrated waste management program should consider three important elements of success: 1) recognizing their solid waste problems, 2) obtaining public support, and 3) being open to technical assistance from outside sources. The Bois Forte Band of Chippewa in Minnesota has successfully partnered with local, state, and federal government agencies, along with a nonprofit organization and a local university, to restore and preserve the tribal environment. In the early 1990s, EPA released regulations requiring that tribes and municipalities close all open dumps. The Bois Forte Band of Chippewa, IHS, and BIA set up a task force to determine the next steps. Working with IHS and BIA, and with money from a 3-year grant from EPA, the Bois Forte Band developed and implemented an aggressive solid waste management plan that called for the closure of existing dumps, development of waste management infrastructure, and significant reductions in the volume of the solid waste stream. To date, the Boise Forte Band has built two transfer stations and a demolition landfill and is planning a composting facility.

Public Support

The ability to successfully develop and implement waste management regulations depends on the willing compliance of tribal members. Even a well-funded regulatory program might not be successful if it does not receive support and approval from tribal members. For this reason, you might consider involving tribal members in all of the development and implementation phases of the regulatory program. Regulations are more likely to have tribal support when their development process is open and inclusive and when everyone understands that their purpose is to promote tribal goals and values and to protect the health and resources of the tribe.

As a part of its public outreach efforts, the Solid Waste Department of the White Mountain Apache Tribe of Arizona produced a brochure that includes excerpts from the tribe's solid waste code, the curbside pickup schedule, a hotline number for reporting illegal dumping, a picture of an illegal dump site, and a reminder list for proper waste disposal. The department distributed a copy to each resident through the reservation's post offices.

Intergovernmental Support

Waste management issues often are regional, and successfully implementing a new tribal regulation might require coordinating tribal regulatory programs with other local, state, or regional regulatory programs.

Coordinating a Regulatory Program with Other Non-Regulatory Programs

Successful waste management efforts can include both regulatory and non-regulatory programs. Non-regulatory programs are based on the idea that if tribal members understand how to manage their waste and the health and environmental impacts of improper disposal, and if affordable options are widely available, then they will manage solid waste in a manner that protects tribal health and resources.

Focused regulatory measures are important tools that can help tribes when non-regulatory measures alone are not effective. To be most effective and efficient, your tribe can coordinate regulatory measures with non-regulatory measures to the maximum extent possible. Codes and regulations might focus on identifying actions or practices that your

tribe wants to strictly regulate or prohibit, such as open dumping, open burning, or disposal of hazardous wastes. Non-regulatory programs can provide the means, incentives, and options for meeting those requirements.

When developing codes and regulations, consider how regulatory and non-regulatory programs can complement each other. The following examples illustrate how tribes can set up complementary regulatory and non-regulatory programs.

Recycling

You can coordinate waste management regulations with a recycling program by mandating certain practices, such as: separating recyclables from waste to facilitate recycling efforts; prohibiting disposal of certain recyclable materials; requiring businesses and institutions to prepare recycling plans; encouraging recycling through regulatory initiatives such as buy recycled initiatives; or setting a voluntary goals to reach a certain recycling rate.

Composting

You can coordinate waste management regulations with various voluntary composting options. You can set prohibitions or limitations on the disposal of certain waste materials, such as yard trimmings, that can be composted in available facilities.

Source Reduction

Some tribes have coordinated waste management regulations with existing tribal solid waste source reduction efforts. The Campo Band of Mission Indians of California recognized in the Campo Indian Reservation Solid Waste Management Code of 1990 that:

"Methods of solid waste management emphasizing source reduction, recovery, and recycling of all solid waste are essential to the long-range preservation of the health, safety, and well being of the public, to the economic productivity of the Campo Band and the state of California, to the environmental quality of the reservation and the state of California, and to the conservation of natural resources."

Public information can support source reduction efforts. These might focus on tribal government procurement and purchasing requirements, promoting the use of recycled paper or double-sided copying, or goals for reducing generation of solid waste by a particular year.

Household Hazardous Waste Collection

You can coordinate regulations with non-regulatory efforts to remove household hazardous waste—including paint, batteries, used oil, pesticides, and cleaning products—from the waste stream.

The Metlakatla Indian Community of the Annette Islands Reserve in Alaska adopted a Waste Management Ordinance in 1999 that requires safe disposal of household hazardous waste. In conjunction with its regulatory efforts, the community held a household hazardous waste collection event designed to attract as many residents as possible, to make them aware of the new regulations, provide advice on safe household hazardous waste characterization and handling procedures, identify non-hazardous substitutes for com-

Household hazardous waste collection at the Pueblo of Santa Clara's transfer station.

mon hazardous household products, and remove as much existing household hazardous waste as possible from the waste stream.

The implementation provisions of many existing tribal regulations include prohibitions on certain activities, such as open dumping or open burning of solid waste. They also might include planning requirements, performance standards, design criteria, identification of acceptable waste management practices, and numerous other provisions for implementing regulatory programs. Though implementation provisions can vary significantly depending on the scope, complexity, and number of issues addressed, prohibitions are among the most common methods for implementing tribal regulations.

The Campo Band of Mission Indians of California adopted a Solid Waste Management Code in 1990 that includes the following language prohibiting open dumping:

"In order to protect the limited land, air, and water resources of the reservation from irremediable hazardous pollution and to protect the health, safety, and welfare of all residents of the reservations and surrounding communities, disposal of solid waste in any open dump is expressly prohibited within the exterior boundaries of the reservation."

The Solid Waste Disposal Ordinance of the Manzanita Tribe of Kumeyaay Indians in California contains the following prohibitions:

a. *No person shall dispose, release, discharge, or conduct open dumping or open burning of any solid waste on the Manzanita Indian Reservation except as provided in this ordinance.*

b. *No person shall generate, store, transfer, transport, treat, discharge, release or dispose of a hazardous waste through the conduct of any business on the Manzanita Indian Reservation, except as permitted under RCRA and/or this ordinance.*

c. *No operator, owner, agent, or employee of any business, industry or facility within the exterior boundaries of the Manzanita Indian Reservation shall dispose, or cause to be disposed, any solid waste in the waste receptacles of any other business, industry, facility or residential premises.*

The Open Dump Ordinance adopted by the Fallon Paiute-Shoshone Tribe in Nevada includes the following prohibition:

"No person shall dump on any public reservation lands the following, which includes, but is not limited to, any rubbish, swill, refuse, cans, bottles, paper, vegetable matter, carcass of any dead animal, trash, used motor vehicle tires, motor vehicle batteries, motor vehicle oils or fluids, sewage,

Pueblo of Santa Clara's hazardous waste storage area at its transfer station.

sludge, garbage or other toxic and hazardous wastes."

Enforcing a Solid Waste Management Code

Once you have developed and adopted codes or regulations and implemented the regulatory program, you will need to enforce your requirements. To be most effective, regulatory enforcement should focus on the highest priority issues. Identifying these issues will be most effective if the public is involved. Enforcement provisions in existing tribal regulations vary widely. Following are a few examples of these provisions.

The Gila River Indian Community (GRIC) in Arizona designed an illegal dumping enforcement program that combines partnerships with continual publicity to achieve results. The community's Solid Waste Ordinance allows law enforcement officials to confiscate vehicles involved in illegal dumping incidents and assess a fine. Vehicle impoundment increases the chance that an illegal dumper, whether or not he/she resides on the reservation, will appear in court later. Police, prosecutors, and judges established a system to make the impoundment process run smoothly. The community uses an outside company to impound vehicles.

GRIC's Department of Environmental Quality (DEQ) supplied tribal rangers and police officers with a map of dump sites to target patrolling efforts. Gila River rangers do their best to patrol reservation borders and illegal dumping hot spots. They perform routine patrols, conduct stakeouts at night, and respond to illegal dumping reports from residents. As a result, the community is having more success catching and prosecuting illegal dumpers. In one case, a waste material pumper truck driver was caught discharging waste into an irrigation canal next to the Gila River. The driver received a citation for trespassing on community land, and the company received an illegal dumping citation. The company, DEQ, and the tribal prosecutor reached a settlement in tribal court under which the company had to clean the contaminated soil and pay an $8,302 penalty to the community. DEQ developed a press release on the case and distributed it to local newspapers.

The Hannahville Indian Community in Michigan has rules and regulations for solid waste disposal that provide the following enforcement provisions:

a. *Under the direction of the Tribal Council and the Health Board, the Solid Waste Administrator (Health Administrator) and all tribal law enforcement and conservation enforcement personnel are empowered to enforce these rules and regulations.*

b. *Actions for violations may be heard in tribal court by conservation citation, summons and complaint, or criminal warrant.*

c. *Violation of any provision of these rules and regulations may be punished or remedied by a civil fine or forfeiture not to exceed $1,000. Each day of any continuing violation may be charged as a separate violation.*

The Open Dump Ordinance adopted by the Fallon Paiute-Shoshone Tribe in Nevada includes the following provision for violations of tribal requirements:

If found guilty of any violations of this Ordinance the Civil Penalties will be as follows:

Accidental and Unintentional Acts:
A fine not to exceed $10,000 per day, plus the costs of clean up to restore the site to its near original state.

Intentional Acts:
First Offense:
A fine not to exceed $25,000 per day, plus the costs of clean up to restore the site to its near original state.
Second Offense:

A fine not to exceed $50,000 per day, plus the cost of clean-up to restore the site to its near original state, plus imprisonment for a minimum 1-year term.

Chapter Highlights

- Develop and tailor a regulatory approach to solid waste that meets your tribe or village's specific needs.
- Identify which portions of your solid waste program require codes and what the scope of these codes should be (i.e., comprehensive versus targeted).
- Educate community members on the purpose and meaning of your solid waste codes. Understanding leads to acceptance and compliance.
- Enforce your codes consistently and equitably. Regulations are only as effective as their enforcement.
- Adequately fund enforcement.

Resources

The full titles of codes cited in this chapter, as well as additional tribal codes, are provided below. Some codes are not currently available on the Web. To request a copy of these codes, refer to Appendix B for the tribe's contact information.

Issue-Based Codes

- Campo Band of Mission Indians (California) Solid Waste Management Code of 1990. This code focuses primarily on the issues of open dumping and open burning. Download a Word Perfect version from this Web site: <www.epa.gov/epaoswer/non-hw/tribal/thirds/regmsw.htm>.
- Fallon Paiute-Shoshone Tribe (Nevada) Open Dump Ordinance. This code focuses on the issue of open dumping.
- Manzanita Tribe of Kumeyaay Indians (California) Solid Waste Disposal Ordinance. This code focuses primarily on the issues of open dumping, open burning, and hazardous waste. Download a Word Perfect version from this Web site: <www.epa.gov/epaoswer/non-hw/tribal/thirds/regmsw.htm>.
- Walker River Paiute Tribe (Nevada) Draft Solid Waste Burning Prohibition Ordinance. This code focuses on the issue of open burning of solid waste.
- Metlakatla Indian Community (Alaska) Cleanup and Closure Guidelines for Open Dumps. These regulations focus on the standards and procedures for the cleanup of open dumps.
- Cheyenne River Sioux Tribe (South Dakota) Solid Waste Ordinance #33. This ordinance is focused on the siting of a sanitary landfill facility.

Comprehensive Codes

- Rules And Regulations Providing Standards For Solid Waste Disposal for the Hannahville Indian Community's (Michigan) Solid Waste Management Plan.
- Lac Du Flambeau Tribal (Wisconsin) Solid Waste Code. WordPerfect file accessible at <www.epa.gov/epaoswer/non-hw/tribal/thirds/ regmsw.htm>.
- Rosebud Sioux Tribe (South Dakota) Solid Waste Code. WordPerfect file accessible at <www.epa.gov/epaoswer/non-hw/tribal/thirds/regmsw.htm>.
- Environmental Code of the White Mountain Apache Tribe (AZ) is accessible at <thorpe.ou.edu/archives/apache/environmental.html>.

- The St. Regis Mohawk Tribe's Solid Waste Management Code is available at <www.srmtenv.org/swcode.pdf>

Model Code Templates

- The following Web site: <www.tribal-institute.org/lists/codes.htm>, includes sample or model codes that were not developed for any specific tribe or nation, but were intended to be used by tribal governments as a starting point that can be built upon, modified, and adapted according to the needs and customs of each individual tribe. The majority of these sample codes provide options and commentaries for tribes to consider in evaluating and adapting the code to meet their specific needs.
- The Inter Tribal Council of Arizona, Inc. Model Tribal Solid Waste Management Code, available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/itc10746.txt>.
- The National Indian Justice Center Model Tribal Solid Waste Ordinance. Contact at 707 579-5507 or on the Web at <www.nijc.org/main.htm>.

Other References

- *Tribal Waste Journal: Respect Our Resources: Stop Illegal Dumping*. Issue 1. EPA Solid Waste and Emergency Response. EPA530-N-02-001. May 2002. <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/twj-1.pdf>
- Bois Forte Chippewa and Outside Agencies Band Together for Integrated Waste Management. Waste Management in Indian Country. <www.epa.gov/tribalmsw/thirds/boisforte.htm>.
- *Solid Waste Management Planning for Rural Communities in Alaska: Community Resource Guide and Planning Workbook*. Available from the Alaska Native Health Board in 2004.
- *Tribal Leaders Are Key to Reducing Backyard Burning*. EPA530-F-03-016. August 2003. <www.epa.gov/msw/backyard>.
- *Reducing Backyard Burning in Indian Country*. EPA530-F-03-017. August 2003. <www.epa.gov/msw/backyard>.
- EPA's construction and demolition debris Web site <www.epa.gov/epaoswer/non-hw/debris>.
- EPA's Management of Scrap Tires Web site <www.epa.gov/epaoswer/non-hw/muncpl/tires/index.htm>.

Chapter 4. Solid Waste Collection and Disposal Programs

A key component of a strong tribal solid waste management program is setting up a collection and disposal system that is compatible with the needs of your tribe or village. Through careful planning, you can ensure that your system will effectively manage your waste stream, safeguard tribal members' health, and protect the environment. Many tribes have found that developing convenient and affordable waste collection and disposal alternatives is the most effective way to stop illegal dumping.

This chapter explores the benefits and costs of different waste collection and disposal options for everyday household waste, as well as construction and demolition debris and hazardous waste. It includes case studies and tables that weigh various options in terms of criteria that are important to tribes. All materials referenced or cited in this chapter are included in the Resources section at the end of this chapter. This chapter also illustrates the key elements of a comprehensive illegal dumping prevention program—site maintenance and controls, community outreach and involvement, targeted enforcement, and measurement.

Getting Started

> "Everyone has different goals and needs. Do a feasibility study to know your needs."
>
> ~Merlin Tafoya, Sr., Executive Director of Public Works Division, Jicarilla Apache Nation

Each tribe has a unique history, culture, financial situation, and geographic location. These key factors all will play a role in determining the collection and disposal options that are right for your tribe. Each tribe also generates a variety of types of waste in its waste stream, depending on its size, geographic location, and the activities taking place in the tribe. Waste assessments can help you develop a collection and disposal system that matches your particular waste types and generation rate. They also can help you decide whether or not to collect recyclable materials; compost organic wastes; or develop a management system for household hazardous waste, bulky items, and construction and demolition debris. The Spirit Lake Tribe in North Dakota conducted a waste sort to determine waste composition and volume before starting its waste collection program. See Chapter 2 for more exam-

ples of other tribes' experiences and information on waste stream analyses.

Decisions about what materials to collect, as well as how to collect, transport, and ultimately dispose of them, are all interrelated. Whether you are starting a solid waste management program or enhancing an existing system, thinking through the entire collection and disposal process will help guarantee your program's success.

Collection Options

There are three basic collection systems:

- Drop-off sites
- Direct access to transfer stations
- Curbside collection

Table 2 compares some of the capital costs associated with drop-off sites and curbside collections systems in rural areas.

Drop-off Sites and Direct Access to Transfer Stations

Drop-off sites are centrally located facilities with containers where tribal members deposit their waste. Some tribes also facilitate direct access to transfer stations so tribal members can take their trash to these larger facilities themselves. These collection options are less convenient for residents than curbside collection but keep collection costs down for the tribe. Tribes can own and operate these facilities or make arrangements with neighboring communities to use their facilities.

The Bois Forte Band has drop-off boxes at two locations on its northern Minnesota reservation. Through an agreement with the tribe, St. Louis County owns the drop-off boxes and collects trash and recyclables from the tribe.

Table 2. Estimated Waste Collection Capital Costs

	Waste Drop-off Sites	Curbside Collection
Site development		
Household solid waste	$3,000–4,000	
Other solid waste	$30,000–40,000	$30,000–40,000
8 cubic yard drop-off container (e.g., green box)	$4,000–5,000 each	N/A
Large plastic container (< 90 gallons)	N/A	$50
40-cubic-yard roll-off container (for bulky items and C&D)	$3,000–5,000	$3,000–5,000
30-cubic-yard front loading packer/ collection truck	$100,000–110,000	$40,000–60,000
Other equipment	$25,000–30,000	$0
Maintenance shop (optional)	$40,000–50,000	$40,000–50,000
Transfer station	$200,000–400,000	N/A

Source: TASWER and SWANA. *Developing and Implementing Integrated Solid Waste Management Systems for Tribes,* Spring 2003, p. 50.

Recyclables collection containers used by the St. Regis Mohawk Tribe.

Members of the Red Cliff Tribe of Wisconsin take their trash directly to a tribally owned transfer station. The tribe funds transfer station operations through a Pay-As-You-Throw (PAYT) program. Tribal members must bring their trash to the transfer station in special trash bags that they can purchase from the tribe. The PAYT system encourages residents to reduce the solid waste they dispose of, as members must purchase more trash bags to throw away larger volumes of trash.

Curbside Collection

You can customize a waste collection program to fit your tribe's or village's specific needs. With curbside collection programs, tribal members can deposit their trash in containers right outside their homes, and haulers pick it up and take it away for disposal. This system is more convenient for residents, but more expensive than other types of collection programs because it has higher transportation and labor costs. Transportation costs can add up quickly when collection trucks serve rural communities where residences are spread out over a large area.

One tribe that runs a curbside collection program is the Jicarilla Apache Nation in New Mexico, which provides free, weekly waste collection to all residents. The nation owns two 14-cubic-yard capacity compactor vehicles. The vehicles collect and transport the waste to a tribally owned and operated transfer station that handles 12 to 16 tons of waste per day.

Combining Collection Options

Some tribes find that a combination of collection options works best. The Assiniboine and Sioux Nations of Fort Peck Reservation in Montana show that tribes can incorporate elements of several waste collection options

The St. Regis Mohawk Tribe's curbside collection program in action.

into a successful program. The reservation's population extends across six towns in Valley and Roosevelt Counties, and residents in the towns have adopted varied collection systems. The Assiniboine and Sioux Nations obtained funding from the Department of Housing and Urban Development (HUD) and IHS to build roll-off sites for five of the towns. Residential and business customers pay a monthly permit fee to dispose of waste at these sites. The nations' Operations and Maintenance (O&M) Department hauls waste from two of the sites to a landfill in Roosevelt County, where they pay a tipping fee. The nations pay for a private trucking company to haul waste from the other sites to a landfill in Valley County. Valley County charges a flat fee for using the landfill, based on the county population.

Table 3. Estimated Annual Operating Costs for Solid Waste Management Systems*

Labor:	
Administration	$10 per hour
Other	$5–7 per hour
Benefits	30% of salary
Vehicles:	
Maintenance	$0.20–0.35 per mile
Fuel	$0.10–0.20 per mile
Roll-off containers	$100–300 each load
Contingency	$10,000–30,000 per year

*In addition, there will be annual capital costs for items such as household containers (5-year average life expectancy), roll-off containers (10-year life expectancy), buildings (25-year life expectancy), or collection trucks (150,000 miles life expectancy).

Source: TASWER and SWANA. *Developing and Implementing Integrated Solid Waste Management Systems for Tribes,* Spring 2003, p. 52.

The Fort Peck Reservation also pays a private trucking company to collect materials at the curbside in two of the towns on the reservation. O&M charges residential customers a monthly fee—currently $14, which is added to residents' utility bills—to support curbside collection service. This option worked for Fort Peck because the tribes solicited input from members before implementing the plan and gave members a choice. Before O&M instituted a rate change, the tribes held a public hearing and asked residents if they would prefer to use a roll-off container or pay a higher collection fee. Residents in one town decided to pay the higher fee. Residents in another decided to use the roll-off container, but later agreed to pay the higher fee.

Outside Factors Affecting Collection Options

Tribal collection can be affected by factors outside the scope of the tribe's control. Winter weather can make rural curbside collection impractical in some areas, particularly for Alaskan Native villages, which can be covered in snow and ice the majority of the year. The Alaskan Native Village of Kipnuk uses all-terrain vehicles to collect trash from residents twice a week during the summer. During the long winter, regular waste pickup is not possible and trash can accumulate in the village. The Kipnuk Traditional Council decided to address the problem by building 10 wooden sleds outfitted with trash dumpsters. During the winter, the sleds rest in the village near the honey bucket stations. Periodically, community members use snow machines (i.e., snowmobiles) to move the sleds out of the village to the landfill.

Collecting Recyclables and Special Wastes

Planning a waste collection system also should include consideration of how to manage recyclable materials and special wastes.

Collecting recyclables will be feasible for some tribes and can offer benefits such as lowering disposal costs, preserving resources, supplying the tribe with manufacturing feedstocks and materials such as compost, and generating revenue. Other tribes, however, might find that collecting recyclables is infeasible or too expensive, especially if they are located far from processing centers and markets. For more information on tribal recycling issues and resources, refer to Chapter 5.

Your tribe also should plan for proper management of special wastes—including used oil, tires, white goods, bulky goods, household hazardous waste, and construction and demolition debris. If disposed of improperly, these materials can be unsightly and even pose health threats to tribal members. They also can contaminate the tribe's waste stream and disrupt collection and disposal activities. Following you will find examples of how a variety of tribes manage special wastes.

- Employees at the Jicarilla Apache Nation's transfer station in Arizona screen waste for contaminants, such as tires and household hazardous waste, to make sure they are removed from the general waste stream and are disposed of appropriately. To help prevent contamination, you can educate your community members about proper disposal practices for these materials and develop programs to ensure their safe management.
- Some tribes designate specific collection depots for special wastes. The Alabama-Coushatta Tribe of Texas encourages residents to bring used tires and oil to a local auto shop that accepts them for a small fee. The tribe also contracts with a local salvage yard that hauls away bulky items that contain metal for free. Tribal members simply place these items in a designated location at the transfer station.

Scrap metal recycling pile at the Eastern Band of Cherokee Indians' transfer station.

- The White Mountain Apache in Arizona took a different approach. The tribe hosts an annual "Clean Your House Day" to give tribal members an opportunity to dispose of large bulky items. The tribal Public Works Department sets out large bins at different locations on the reservation, and residents can drop off their items without having to pay a special disposal fee.
- In Minnesota, the Red Lake Band of Chippewa co-locates permanent household hazardous waste collection containers at its solid waste drop-off sites, while the Fond du Lac Band of Lake Superior Chippewa hosts household hazardous waste collection events. In addition, high school students have conducted a thermometer exchange on Fond du Lac Reservation to safely remove mercury-containing thermometers from the community.
- For many tribes, construction and demolition debris comprises a significant portion of the solid waste stream. The Fort Peck Tribes of Montana had problems with contractors placing bulky construction and demolition debris in tribal roll-off bins. The bins filled up quickly,

forcing the tribes to pay thousands of dollars in landfill tipping fees. To address this issue, the tribes decided to manage construction and demolition debris separately from MSW. The Fort Peck Operation and Maintenance Department now rents construction and demolition debris dumpsters to contractors and transports their waste to a special C&D debris landfill.

- Special wastes can be particularly problematic for remote Alaskan Native villages, since transporting the wastes to an appropriate management facility is difficult. For this reason, the Native Village of Barrow-Inupiat Traditional Government has taken an active approach to educating the Inupiat people about safe storage and disposal of household hazardous wastes. The Inupiat Traditional Government identified the kinds of potentially hazardous wastes being produced in the community and then used the local radio and television networks to reach out to members with information about safe management.
- The Onondaga Nation in New York decided to make household hazardous waste disposal a priority. The nation hosts household hazardous waste collection events twice a year to educate the tribal community about proper disposal practices. In addition, the tribe provides public access to a household hazardous waste collection compartment at the transfer station. Tribal members can bring their household hazardous waste to the transfer station 24 hours a day, 7 days a week. The transfer station also includes a storage container for car batteries.

Transfer and Disposal Options

Where does solid waste go after it is collected from residents? Reviewed below are four major transfer and disposal options for tribes:

- Using a transfer station or landfill located off the reservation
- Building a transfer station on the reservation
- Building a landfill on the reservation
- Disposing of construction and demolition debris and hazardous waste

Using a Transfer Station or Landfill Located Off the Reservation

For some tribes, outsourcing—contracting with a public- or private-sector facility to manage discards—is a temporary or permanent waste management solution. Tribes can hire private haulers or contract with local waste management districts to provide service for reservation residents. For tribes that are building a transfer station or landfill, there often is a gap between the time that a tribe closes its open dumps and opens a new transfer station or landfill. If residents do not have a convenient and affordable waste disposal alternative in the meantime, they might resort to illegal dumping. Your tribe can work with a private hauler or local government to provide residents with curbside collection service or access to a designated drop-off site at a nearby transfer station or landfill.

Another example of outsourcing is seen on Fond du Lac Reservation in Minnesota. When the Fond du Lac Band of Chippewa began to close its open dumps, illegal dumping problems increased. The tribe recognized the need to provide residents with convenient and affordable waste disposal alternatives and allowed private waste haulers to offer curbside collection. Private haulers now pick up waste and carry it off of the reservation. They charge reasonable rates, encouraging proper waste disposal. Working with private haulers, the tribe facilitated waste removal for residents without spending tribal funds on a transfer station or landfill. The tribe is studying the feasibility of tribally

Table 4. Weighing Waste Collection Options

Collection Options	Criteria Important to Tribes: Cost-Effective: Cost-Effective for Tribe	Cost-Effective: Affordable for Community Members	Convenience for Community Members	Minimizes Litter, Odor, Dust, Noise, and Vermin	Potential for Source Reduction and Recycling
Curbside Collection (Individual household or shared with neighbors)	• Cost-effective if paid for by tribal members through fees. • Tribally operated service can lower costs, but requires investment in collection vehicle and staff.	• Typically costs more than drop-off sites or transfer stations. • Tribal subsidies can make it affordable for community members. • Community participation increases as disposal options become more affordable.	• Extremely convenient for community members. • Minimal effort to place trash outside of a home or business for collection. • Fosters high participation rates and reduces illegal dumping incidents.	• Waste is stored outside for a short time before it is collected, reducing litter, odor, and vermin problems. • Noise and dust from collection vehicles are limited.	• Convenience encourages recycling. • Combining with PAYT waste disposal creates incentive for recycling. • Requires separate containers and possibly separate collection vehicles. • Co-mingled recyclables need to be sorted before sale to processors.
Drop-off Sites	• Costs the tribe less to transport waste to transfer stations or landfills from consolidation points (drop-off sites) than from individual homes and businesses.	• If not subsidized, tribal members will pay more for curbside collection than to use drop-off sites or transfer stations. • Direct access to a single, centrally located transfer station is less expensive than consolidating and transporting materials from multiple drop-off sites.	• Less convenient than curbside pickup service, but more convenient than direct access to transfer stations. • Convenience increases with multiple drop-off sites. • As convenience increases, participation increases and illegal dumping decreases.	• Storing large quantities of waste at one site for more than a few hours can produce litter, odor, and vermin problems. • Litter can accumulate if sites are not cleaned frequently. • Staffing, fencing, or enclosing sites minimizes these problems. • Appropriate site selection can minimize noise and dust impacts.	• Requires separate collection bins, but this eliminates need to sort recyclables before sale to processors. • Providing free recycling with PAYT waste disposal creates incentive to recycle. • Convenience dependent upon number of sites, locations, and hours of operation. • Can arrange for direct pickup from sites by processors.
Direct Access to Transfer Station	• If the tribe does not operate its own transfer station, it can enter an agreement with a surrounding town or county. • Tribe can compensate surrounding town or county for direct access to a transfer station off the reservation. • Collection costs go up if tribe compensates town or county from tribal coffers.	• Tribe can reduce the tipping fees or solid waste fees it charges tribal members. • Tribe does not have to pay for transportation to a consolidation point. • Although these costs are not reflected in the tipping fees or solid waste fees, tribal members absorb them.	• Not convenient if transfer station is located far away from the tribal members who will be using it.	• Storing large quantities of waste at one site for more than a few hours can produce litter, odor, and vermin problems. • Litter may accumulate if sites are not cleaned frequently. • Staffing, fencing, or enclosing sites minimizes these problems. • Appropriate site selection can minimize noise and dust impacts.	• Requires separate area and containers for recyclables. • Combining free recycling with PAYT waste disposal creates incentive to recycle. • Can sort to reduce contamination, bale for easier handling, or store at facility until find acceptable market price.

operated waste hauling services but meanwhile continues to move the waste directly to an off-reservation facility.

Finally, some tribes view outsourcing as a long-term solution. For example, the Assiniboine and Sioux Nations of Fort Peck Reservation in Montana annually pay Valley County $75 per household for residents in the county to use its landfill. The nations pay for a private trucking company to perform curbside collection in Frazer, which lies in Valley County. The trucking company hauls household waste directly to the Valley County landfill. Some tribes also own or operate their own trucks and haul waste to a landfill located off of the reservation. An advantage of this approach is that the tribe retains flexibility. It also incurs minimal liability compared to owning and operating a landfill on site. The tribe also avoids the need to budget for closure and post-closure care of the landfill. Closure consists of either capping the landfill or removing the waste and any other contaminated soils or structures. Post-closure care typically includes groundwater and landfill gas (i.e., methane) monitoring and maintenance of the final cover.

Building a Transfer Station on the Reservation

"It is important to know how much you are generating and what you are generating when you choose a transfer station design."

~Laura Weber,
Director of Solid Waste Management,
St. Regis Mohawk Tribe

Some tribes find, after studying the alternatives, that collecting and managing their waste on site is safer and more economical. If such issues are important to your tribe, then you might consider building a transfer station on your reservation. A transfer station is a facility where waste materials are taken from smaller collection vehicles and placed in larger vehicles for transport to their ultimate site of disposal—often a landfill. Although these transfer station facilities require funds for construction, they might lower your waste management costs over the long term. Typically, transfer stations are less expensive than landfills because they require less money for construction, operation and maintenance, and do not require the expensive closure and post-closure care that landfills do. Table 5 presents construction and equipment cost and the expected life for the common structures and equipment used at a transfer station.

In addition, your tribe might build a transfer station rather than a landfill because you do not generate very much waste. Consider, however, that when a tribe builds a facility on the reservation, it still does not have total control over costs, availability of trained personnel, and markets for recovered materials. Some tribes prefer to delegate, or contract out, solid waste services to reliable companies, finding that they save money and the waste is easier to manage that way.

Transfer stations can be designed for versatility, to accept anywhere from 1 ton of waste per week to several hundred tons of waste per day. Communities use waste assessments to estimate waste generation rates and properly

Collection truck dumping waste at the Eastern Band of Cherokee Indians' transfer station.

Table 5. Transfer Station Construction and Equipment Costs and Life Expectancy*

Item	Cost	Life (years)
Ramp and retaining wall	varies with size	25
Building	$42 per square foot	25
Fencing—Chain link (installed)	$10 per linear foot	20–30
Rolling gate (Chain link)	$400 each	20–30
Fencing—Wood (installed)	$9 per linear foot	15
Crushed rock	$10,760 per acre ($2.25 per square yard)	5
Concrete (6 inches deep, no labor)	$46,750 per acre ($9.50 per square yard)	25
Concrete (4 inches deep, no labor)	$31,540 per acre ($6.50 per square yard)	25
Asphalt (7 inches deep, no labor)	$62,610 per acre ($13 per square yard)	10–15
Stabilization (8 inches deep)	$16,940 per acre ($3.50 per square yard)	10–15
Dumpster (6-8 cubic yards)	$450–600	5
Roll-off boxes, 40 cubic yards, open top	$3,200–5,000	10
Roll-off boxes, 42 cubic yards, closed top	$4,250–6,400	10
Stationary compactor, 2 cubic yards	$6,000–9,000	10
Roll-off truck with hoist	$60,000–83,000	10
Yard waste chipper	$20,000–25,000	10

* These costs are provided as reasonable examples. The total cost can vary from a few thousand dollars to more than $100,000.

Source: TASWER and SWANA. *Developing and Implementing Integrated Solid Waste Management Systems for Tribes,* Spring 2003, p. 76.

size transfer stations. Each of the tribes highlighted below chose to build a different type of transfer station.

Small Roll-off Site Solves Onondaga Nation's Waste Management Dilemma

Sovereignty and community size were major factors in the New York-based Onondaga Nation's decision to construct a small transfer station on the reservation. The community's low waste generation rate and reluctance to rely on grants or loans for construction helped tribal leaders rule out building a landfill or large transfer station. The nation decided to build a small, low-maintenance transfer station and worked with a private waste management company to develop a construction and operation plan.

Tribal leaders agreed to build the new transfer station near an old open dump site on uninhabited land between three highways. The transfer station consists of a concrete surface with two roll-off bins—one for household waste and one for recyclable

An example of the self-contained modular waste storage units used by the St. Regis Mohawk Tribe.

materials—inside a chain link fence with a gate. The first bin has a compactor powered by a hydraulic pump which is housed in a small adjacent shelter. Onondaga Nation's contractor hauls away the roll-off bin of compacted trash at least once a week.

The transfer station is only open to Onondaga Nation members. Initially, residents from surrounding counties used the transfer station to avoid paying tipping fees in their own towns. To address this problem, the tribe hired attendants to staff the collection site continually. The attendants also monitor roll-off bins and remove tires, household hazardous waste, and other unacceptable materials to minimize contamination.

Self-Contained Modular System a Perfect Fit for the St. Regis Mohawk Tribe

During the 1990s, residents of the St. Regis Mohawk Tribe in New York were seeking alternative waste management options. At the time, private waste haulers provided curbside collection services for a fee. Residents felt the fee was too high and voiced their concerns to the Tribal Council and Environmental Division. A solid waste management feasibility study revealed that most residents wanted a tribally owned and operated waste disposal facility. The Environmental Division built upon this public sentiment and used it to help gain Tribal Council support for a transfer station. One effective tool in convincing Tribal Council members of the need for such as facility was showing them pictures of existing open dumps on the reservation and explaining how a new transfer station could eliminate such sites.

The Environmental Division conducted a waste audit and determined that the community generates between 6 and 7 tons of waste each day, half of which could be recycled. The tribe decided that its moderate waste generation rate did not warrant building a large transfer station. At the same time, outdoor roll-off containers were a poor option because they would fill up with ice during the harsh winter months. In addition, roll-off bin compactors sometimes fail in the winter. In search of a creative solution, Environmental Division staff and Tribal Council members visited other tribal facilities and trade shows. At one trade show, the tribe discovered self-contained, modular waste storage units.

The tribe purchased two 53-cubic-yard modular waste storage units, designed to withstand harsh outdoor conditions for years. Each unit is an enclosed waste collection container that is leak-, fire-, and animal-proof. Residents can access the unit manually by opening a side door. A door on top of the unit is larger and must be opened hydraulically. The tribe purchased a collection truck for curbside pickup service that can open the top door of the unit using its hydraulic system. The tribe ships its waste from the modular units to a landfill off of the reservation. The tribe also uses four 6-cubic-yard modular containers for collecting recyclable materials at its transfer station. These units are emptied regularly by a truck with a

hydraulic lift system. By diverting recyclable materials from its waste stream, the tribe hopes to keep disposal costs down.

The storage units required more start-up funds than a roll-off site, but less than a large transfer station. The St. Regis Mohawk Tribe obtained grants from IHS, HUD, and the U.S. Department of Agriculture (USDA) to build the transfer station. The tribe's use of federal funds added steps to the design and construction process—the National Environmental Protection Act requires any federal construction project to provide an environmental impact statement, including projects using federal grants. In addition, contractors must demonstrate that they meet federal bonding requirements. Some federal agencies place additional requirements on the use of their funds. For example, USDA's Rural Utility Service required the St. Regis Mohawk Tribe to work closely with a USDA engineer during the design phase. The USDA engineer had to sign off on any change to the original construction plan.

Large Transfer Station Spells Success for Eastern Band of Cherokee Indians

In 1991, the Eastern Band of Cherokee Indians in North Carolina realized that it would have to close the reservation's landfill because it failed to meet the new Resource Conservation and Recovery Act (RCRA) Subtitle D regulations. Tribal members searched for a solid waste solution that would accommodate future community growth, including a planned gaming facility. The tribe decided to build a transfer station capable of handling 300 tons of waste per day. The tribe constructed the transfer station with its own waste in mind, but the facility also is large enough to handle waste from towns outside the reservation.

A large transfer station can bring traffic, noise, odors, debris, and animals to an area. To minimize impacts on the community, the tribe chose to site the transfer station next to the old landfill, where tribal members were accustomed to bringing their waste. The tribe already owned the property, and the tribal council quickly approved the location.

Scale house at the entrance to the Eastern Band of Cherokee Indians' transfer station.

At the Eastern Band of Cherokee Indians' transfer station, a scale for weighing trucks is located at the entrance. Trucks enter the transfer building and dump their loads onto a tipping floor. A front-end loader then pushes the waste into a trailer that sits on a truck one level below. Before leaving the facility, transfer station operators check to make sure that the truck does not exceed the 20 to 21 tons of waste limit set by state and federal transportation regulations. The waste is then hauled to a landfill in South Carolina, where the tribe pays tipping/disposal fees.

Building a Landfill on the Reservation

Finally, a tribe might decide to site a landfill on the reservation. An onsite landfill can be a technically and economically feasible option for a tribe under certain circumstances, such as if the tribe is located far from available waste management facilities

or generates enough waste to make an onsite facility viable. An important factor to remember when making this decision is that costs for a Subtitle D compliant landfill include not only construction and operation and maintenance, but also closure and post-closure care expenses.

Many tribes, however, have decided that landfills require too much land, funding, maintenance, and waste volume to be a viable waste management option. It often is difficult to find enough land on the reservation to build a landfill. In addition, tribal members often object to siting a landfill close to their homes or businesses.

In 1991, the federal government developed more stringent design, construction, operation, and closure criteria for landfills under RCRA Subtitle D. These criteria protect health, safety, and the environment but can make it difficult to control landfill costs. Regulations require that all landfills include a composite liner (a flexible membrane liner above a layer of compacted clay). Other federal requirements that lower risks, but increase costs, include leachate collection systems, groundwater monitoring, and landfill gas management. Building an economically viable small landfill that meets these requirements can be a challenge, and most tribes do not generate enough waste to make building a large landfill worth the cost and effort. In their joint training, TASWER and SWANA estimate that the typical cost of construction per acre of landfill space is between $150,000 and $250,000. At these costs, TASWER and SWANA believe that tribes generating less than 100 tons of waste per day will find building and operating a Subtitle D compliant landfill is not an economically feasible option.

The Alaskan Native Village of Klawock's solid waste landfill.

The federal government recognizes that small, unlined landfills are the only viable waste management option for some communities, including tribes. Consequently, it created two exemptions—one for small communities in cold regions and one for small communities in dry regions. Alaskan Native villages, for example, can be exempt from the federal landfill design and groundwater monitoring requirements if they cannot access a regional waste management facility for several months. These villages qualify for the exemption if they generate less than 20 tons of waste daily and experience an annual interruption of at least 3 consecutive months of surface transportation because of snowfall.

Some tribes in the Southwest also can be exempt from federal landfill requirements. Tribes qualify for the exemption if they generate less than 20 tons of waste daily, have no practical waste management alternative, and are located in an area that receives 25 inches or less precipitation annually.

Though most tribes do not qualify for the exemptions listed above, they can apply to EPA for site-specific flexibility. If a tribe can demonstrate that its landfill will adequately protect human health, safety, and the environment without a composite liner or groundwater monitoring, it can apply for site-specific flexibility or exemption from the federal requirements. Several tribes, including the Oglala Sioux Tribe of the Pine Ridge

Reservation in South Dakota, have taken advantage of this exemption to lower their landfill construction and operation costs.

Landfill Completes Waste Management Strategy for Pine Ridge Reservation

In 1994, members of the Oglala Sioux Tribe (OST) met with representatives from SWANA and the state of Nebraska to discuss hauling trash from Pine Ridge Reservation, located in South Dakota, to a state landfill in Nebraska. Based upon this meeting, the OST decided that operating a transfer station would be too expensive because the state landfill was too far away. A full-scale, Subtitle D landfill seemed to be the best solution because the tribe wanted to retain complete control of its waste and tipping fees. The tribe acquired a $561,000 grant from EPA to plan a landfill and bale building (a building where waste is compacted into bales).

The OST applied for site-specific flexibility and asked the federal government to waive the composite liner requirement. Pine Ridge Reservation contains very dense clay soils, and the tribe demonstrated that the clay performs the equivalent role of an engineered composite liner and would prevent liquids from leaching out of the landfill into the reservation's groundwater supply. EPA granted the Oglala Sioux a waiver.

Environmental Protection Program staff worked closely with regional representatives from each federal agency to fill out grant applications and obtain funding for the project. The tribal council placed solid waste at the top of its Sanitation Deficiency System priority list. Consequently, IHS awarded the tribe $724,000 for landfill construction. The tribe also received $1.2 million from USDA's Rural Development Service.

Disposing of Construction and Demolition Debris and Hazardous Waste

Managing construction and demolition (C&D) debris presents a major challenge for many tribes. C&D debris includes concrete, asphalt, wood, metals, gypsum wallboard (sheet rock), and roofing generated from the construction, renovation, or demolition of structures (e.g., buildings, roads, bridges). Some tribes and states include land clearing debris such as stumps, rocks, and dirt in this category of waste. Most C&D debris is classified as nonhazardous and therefore can be managed with normal waste and disposed of in an MSW landfill.

Due to the size and weight of much of this debris, co-managing C&D debris with MSW can be cost prohibitive. Many tribes have found that managing C&D debris separately is the most cost-effective approach. Since C&D debris materials are typically inert, many states have established special criteria for C&D debris landfills. Siting, design, construction, operation, monitoring, and closure of landfills containing nonhazardous C&D debris are still regulated under RCRA Subtitle D (see 40 CFR part 257), but many of the requirements are much less restrictive than those for MSW landfills.

One major difference for C&D debris landfills is that in most cases they do not require a liner or groundwater monitoring systems. Cover requirements typically are less stringent as well. Air emissions from C&D debris landfills are generally not a concern either, since C&D debris does not contain large volumes of putrescible organic matter that produce landfill gas (methane). If gypsum wallboard is present in C&D debris, however, the landfill might produce hydrogen sulfide, with its distinctive rotten-egg odor, particularly if moisture is introduced into the waste. Tribes operating landfills that manage large amounts of these materials might need to install gas control systems to reduce odors.

Table 6. Weighing Your Waste Disposal Options

Disposal Option	Short-Term Startup Costs	Long-Term Operation/ Maintenance Costs	Costs for Individual Tribal Members	Minimizes Controversy Over Siting	Minimizes Liability	Minimizes Litter, Odor, Dust, Noise, and Vermin
Outsourcing: Using a transfer station or landfill located off the reservation	Low. No funds required for planning or construction.	Low. No equipment for the tribe to maintain.	Low to High. Tribe has no control over transfer station or landfill tipping fees, unless it has a long-term contract.	Tribe does not have to site a transfer station or landfill on tribal land.	The town, county, state, or company that operates the facility is liable for any health and environmental problems.	Outsourcing reduces potential health, environmental, and aesthetic problems associated with storing large quantities of waste in a single location on the reservation.
Building a transfer station	Moderate. Tribe must obtain funding for transfer station equipment. Building a transfer station costs less than building a landfill.	Moderate. Requires continuous funding for operation and maintenance.	Low to Moderate. Tribe sets disposal rates for residents; however, tribe is subject to tipping fee increases because it transports trash to a landfill or incinerator.	Requires less space and is easier to site than a landfill. Residents sometimes object to siting a transfer station close to their community.	Tribe liable for any problems that might occur at the transfer station. People may leave hazardous waste or start fires at small, un-staffed transfer stations.	Trucks entering and leaving can produce dust and noise. Waste can produce foul odors and attract vermin. Tribes can reduce these problems by paving nearby roads and building an enclosed facility and fencing the site.
Building a landfill	High. Even if tribe obtains a waiver from some federal requirements, costs can be high.	High. Unless tribe obtains a waiver from some federal requirements, it is expensive to operate and maintain a landfill both while open and after closure.	Low to High. Tribe dictates disposal rates for residents. If the landfill is expensive to operate and maintain, then higher rates might be needed.	Typically, residents object to siting a landfill near their community. Requires so much space that it is difficult to find enough land to build one.	Tribe assumes liability for problems associated with the landfill during both active life and the post-closure care period.	Building the landfill and disposing waste on a daily basis produces dust, noise, odors, and litter. It also attracts birds, animals, and vermin. Paving nearby roads and covering waste at the end of each day prevents some of these problems.
Building a C&D debris landfill	Low to moderate. Need to acquire adequate land and do minor excavation to prepare site. If liner or monitoring systems are required, cost will increase.	Moderate. Requires operation and maintenance funding. If need to maintain liner and monitoring systems, costs will increase.	Low to moderate. Tribe establishes disposal rates. Increases in operating costs will affect disposal rates.	Requires significant amount of space. Residents might object to siting near their community (but should be less opposition than msw landfill).	Tribe assumes liability for problems associated with the landfill during both active life and the post-closure care period.	Dust and noise can be a problem. Odors and vermin typically not a problem. Litter is not a likely problem, but could be some wind-blown paper materials.

Funding a Collection and Disposal Program

After choosing a waste collection and disposal option, your tribe must figure out how to finance it. A variety of financing mechanisms are available to your tribe:

- **Subsidizing the program from the tribal general fund.**
  The Gila River Indian Community in Arizona subsidizes curbside collection by public works to make waste disposal cheap and convenient for tribal members.
- **Charging residents a flat fee.**
  The Fort Peck Tribes in Montana charge residents $15 per month to use tribal roll-off sites. Community members drop off their trash at a few bins scattered throughout the reservation. The tribes are considering switching to a Pay-As-You-Throw system. The Shoshone-Paiute Tribes of Duck Valley, which straddles land in Idaho and Nevada, charges residents a solid waste fee, which appears on their monthly electrical bills.
- **Asking residents to work directly with a private hauler or local government.**
  Members of the Delaware Nation in Oklahoma pay a private hauler for curbside collection.
- **Instituting a Pay-As-You-Throw (PAYT) program.**
  Communities with PAYT programs charge residents for solid waste collection based on the amount they throw away, creating a direct economic incentive to recycle more and to generate less waste. The St. Regis Mohawk Tribe of New York charges residents based on how much they throw out. Under this PAYT program, tribal members purchase 30-gallon blue disposal bags from the tribe. The blue bags are picked up weekly by the tribe.

For more information on financing a tribal solid waste management program, refer to Chapter 7.

If your tribe decides to build and operate a C&D debris landfill, you can finance the operation in several ways. One approach is to charge a flat fee per load of C&D debris dumped. Another approach is to create a "pay-as-you-use" system where by tribal members are charged per pound of material disposed. Using this type of per weight system will require a scale house and an attendant at the landfill entrance. A simple method of operation is to weigh incoming vehicles and then weigh them again on the way out. The hauler would pay based on the difference in the two weight measurements.

Some C&D debris may be classified as hazardous waste because it contains hazardous materials, such as lead or chromium, or has been contaminated by other hazardous waste. Hazardous C&D debris must be disposed of in a hazardous waste landfill. Other

Tribal members cleaning up an open dump on the White Earth Band of Chippewa's reservation.

Before and after photographs of an open dump cleaned and restored by the Shosone-Paiute Tribes of Duck Valley.

toxic materials, such as asbestos and polychlorinated biphenyls (PCBs), must also be managed in accordance with federal regulations, as spelled out by the Toxic Substances Control Act (TSCA).

Increased new home construction on the Bois Forte Band of the Minnesota Chippewa Tribe reservation, coupled with the demolition or refurbishing of old buildings, necessitated the development of a landfill for C&D debris. IHS helped the tribe locate and design a 25,000-cubic-yard landfill based on federal and state regulations. In addition to providing disposal for C&D debris, the landfill, which opened in 1998, generates income from disposal charges levied on building contractors.

Table 6 summarizes how the four disposal options—1) using a transfer station or landfill located off of the reservation, 2) building a transfer station, 3) building a landfill, and 4) building a C&D debris landfill—measure up to several criteria that are important to tribes.

Addressing Open and Illegal Dumps

For years, Native American communities used open dumps, burn pits, and burn barrels to dispose of their waste. In 1991, the federal government passed regulations making open dumping illegal. Many open dumps attract vermin, contain materials that are dangerous to curious children or wildlife, pose a fire threat, contaminate surface water and groundwater supplies, and interrupt natural drainage patterns. Burning waste in pits, piles, or barrels releases smoke containing pollutants harmful to human health and the environment. Open burning of waste has been illegal since the passage of the Resource Recovery and Conservation Act of 1976.

Tribes are closing open dumps and banning open burning to protect both the health of their members and the environment. Many tribes, however, continue to experience illegal dumping problems, even after they set up new collection and disposal programs. To successfully deal with the problem, tribes need to adopt a multifaceted approach to illegal dumping prevention that includes **site maintenance and controls, community outreach and involvement, targeted enforcement, and measurement.** The examples included below illustrate the four components of a strong illegal dumping prevention program.

The Lac Courte Oreilles Chippewa Tribe's no dumping signs help deter illegal dumpers.

Site Maintenance and Controls

Site maintenance and controls include planning and implementing cleanup projects and maintaining cleaned sites to prevent continued illegal dumping. Proper planning is often a decisive factor in determining the degree of success of an open dump cleanup effort. In addition to securing the proper equipment and labor, you will need to arrange for the transportation and disposal of the removed waste.

On the Cherry Lake Road cleanup project at the White Earth Band of Chippewa in Minnesota, the tribe hired a contractor that used heavy equipment to clean up large items, and hired local residents to pick up remaining items by hand. Other tribes have partnered with local governments or worked with IHS and BIA staff to clean up sites. For example, the Pawnee Nation in Oklahoma partnered with BIA to clean up most of its open dump sites. The Seminole Nation of Oklahoma also works with neighboring Seminole County to clean up illegal dump sites.

Once cleanup is complete, signs, lighting, barriers to limit access, and landscaping can be used to keep a site clean and discourage future dumping at the site. The Red Lake Band of Chippewa in Minnesota post "No Dumping" signs at cleaned areas that state illegal dumping is punishable by fine and cite the tribal resolution banning illegal dumping. The Wyandotte Nation in Oklahoma installed a fence at one cleaned dump site to limit access and prevent future dumping. At the Cherry Lake Road cleanup, the White Earth Band of Chippewa planted more than 1,000 trees donated by the state to beautify the area and discourage illegal dumping.

Community Outreach and Involvement

Educating community members about waste reduction, recycling, and proper waste disposal can help limit future illegal dumping

Burning waste at the Kokhanok Village (Alaska) landfill.

incidents. Tribal members are more likely to support solid waste management programs if they understand the new waste disposal options and the dangers of open and illegal dumping. To educate tribal members about proper waste disposal, the Keweenaw Bay Indian Community in Michigan developed an illegal dumping pamphlet that details the environmental problems associated with illegal dumping and directs residents to proper waste disposal facilities. The tribe distributes the pamphlet in public buildings on the reservation and at public events such as the annual pow-wow.

Targeted Enforcement

The foundation of any enforcement program is strong and clearly worded solid waste codes or ordinances. Codes or ordinances prohibiting open dumping typically include some sort of penalty or consequence for the illegal dumper. Some penalties used by tribes include fines, collecting the cost of cleanup, community service, or vehicle impoundments. Some tribes, such as the Seminole Nation of Oklahoma, give an illegal dumper the opportunity to clean up the mess before a citation is issued.

For a code or ordinance to be effective, it must be enforced consistently and equitably. The Gila River Indian Community of Arizona developed an aggressive strategy to deter illegal dumping. Under the tribe's Solid Waste Ordinance, tribal rangers and police officers can fine illegal dumpers up to $10,000. Law enforcement officials also have the power to confiscate vehicles involved in illegal dumping incidents. A strong enforcement program can be a powerful illegal dumping deterrent.

One difficulty many tribes experience when attempting to enforce illegal dumping ordinances is the inability to prosecute non-tribal members for illegal acts. Checkerboard land patterns and Indian lands being surrounded by multiple jurisdictions further complicates enforcement issues. A few tribes, such as the Pawnee Nation in Oklahoma, have worked out mutually beneficial enforcement agreements with their neighboring communities. Under agreements with Pawnee and Payne Counties, tribal rangers and the Pawnee Environmental Regulatory Commission share enforcement and prosecution duties with the Pawnee and Payne County courts.

Measurement

Measurement is the final component of a multifaceted illegal dumping program. Measurement can help build community support by quantifying cleanup and closure success. It also can help justify program spending to tribal leaders. The Pawnee Nation Department of Environmental Conservation and Safety in Oklahoma performs a yearly site assessment to identify dump sites. In 1996, department staff identified 40 illegal dumping sites on the reservation. The most recent assessment shows that only four illegal dump sites remain.

EPA Region 5 created the IDEA (Illegal Dumping Economic Assessment) Cost Estimating Model to assess and measure the costs of illegal dumping activities. The model allows tribes to compare the cost of different cleanup methods, equipment investments, and surveillance and prevention techniques. Tribes can apply the model to a single dump site, specific groups of sites, or all of the sites on a reservation.

Most tribal members will stop using burn barrels and open dumps if their tribe provides convenient and affordable waste disposal alternatives. Members of the Alabama-Coushatta Tribe of Texas stopped using burn pits when the tribe built and promoted its new transfer station. The tribe subsidizes disposal costs for members who bring their waste to the transfer station. The

White Earth Band of Chippewa in Minnesota started a tribal curbside collection service for residents to discourage illegal dumping. The tribe collects a small fee from households that subscribe to this service. Residents that can not afford to pay this fee use one of five small drop-off sites for a smaller fee. These collection options have contributed to the success of White Earth's illegal dumping prevention program.

Chapter Highlights

- Understand your tribe or village's waste stream and collection and disposal needs.
- Design your collection and disposal programs to meet your tribe or village's specific needs (including political and cultural needs) and that are in line with your financial and technical resources.
- Involve community members in the decision-making process, especially when deciding services or siting a facility.
- Provide convenient and affordable alternatives to open dumping, and educate community members on their proper use.
- Use a multifaceted approach to open dump clean up and control.

Resources

These three EPA publications (available at the Web sites listed below or by contacting the RCRA Call Center at 800 424-9346) provide detailed guidance on transfer station design, siting, construction, operation, and maintenance:

- *Tribal Waste Journal:* "Against All Odds: Transfer Station Triumphs" (EPA530-N-02-002), May 2003, <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/twj-2.pdf>.
- *Waste Transfer Stations: A Manual for Decision-Making* (EPA530-R-02-002) <www.epa.gov/epaoswer/non-hw/muncpl/pubs/r02002.pdf>.
- *Waste Transfer Stations: Involved Citizens Make the Difference* (EPA530-K-01-003) <www.epa.gov/epaoswer/non-hw/muncpl/pubs/wtsguide.pdf>.
- EPA's *Criteria for Solid Waste Disposal Facilities: A Guide for Owners/Operators* (EPA530-SW-91-089), summarizes the major requirements of the federal municipal solid waste landfill regulations. Available on the Web at <www.epa.gov/epaoswer/non-hw/muncpl/landfill/index.htm> or by contacting the RCRA Call Center at 800 424-9346.
- EPA's *Safer Disposal for Solid Waste: The Federal Regulations for Landfills* (EPA530-SW-91-092), summarizes the federal municipal solid waste landfill regulations. Available on the Web at <www.epa.gov/epaoswer/non-hw/muncpl/landfill/index.htm> or by contacting the RCRA Call Center at 800 424-9346

Code of Federal Regulations, Title 40, Part 258 (40 CFR Part 258)—Criteria for Municipal Solid Waste Landfills, available on the Web at <www.epa.gov/epaoswer/non-hw/muncpl/disposal.htm>.

EPA's *Site-Specific Flexibility Requests for Municipal Solid Waste Landfills in Indian Country Draft Guidance* (EPA530-R-97-016), helps tribes apply for site-specific flexibility. Available on the Web at <www.epa.gov/epaoswer/non-hw/muncpl/landfill/indian/siteflex.pdf> or by contacting the RCRA Call Center at 800 424-9346.

EPA's *Seminar Publication: Design, Operation, and Closure of Municipal Solid Waste Landfills* (EPA625-R-94-008), available from the National Service Center for Environmental Publications at <www.epa.gov/ncepihom/ordering.htm>.

EPA Region 5 has the *Illegal Dumping Prevention Guidebook* <www.epa.gov/region5/illegaldumping> and information on the IDEA (Illegal Dumping Economic Assessment) cost estimating model. Contact the EPA Region 5 Illegal Dumping Prevention Project at 312 886-7598.

EPA's *Tribal Waste Journal*, "Respect Our Resources: Prevent Illegal Dumping" (EPA530-N-02-001), includes additional case studies and is available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/twj-1.pdf> or by contacting the RCRA Call Center at 800 424-9346.

The Bureau of Indian Affair's (BIA) *Manual for Assessment of Open Dumping on Indian Lands: Site Closure and Maintenance*, available from your regional BIA representative.

The Central Council of Tlingit and Haida Indian Tribes' *A Guide to Closing Solid Waste Disposal Sites in Alaska Villages*. Available on the Web at <www.zender-engr.net>.

The following periodicals provide articles and reviews of innovative and successful waste collection and disposal strategies, practices, and technologies. Advertisements in these periodicals also contain information on new technologies, collection and disposal equipment, and engineering and consulting services that can help you meet your tribe or village's solid waste management needs.

- *MSW Management* — <www.forester.net/msw.html> Phone: 805 682-1300 Fax: 805 682-0200 Mailing address: Forester Communications, Inc, P.O. Box 3100, Santa Barbara, CA 93130
- *Resource Recycling* — <www.resource-recycling.com> Phone: 503 233-1305 Fax: 503 233-1356 Mailing address: Resource Recycling, P.O. Box 42270, Portland, OR 97242-0270 E-mail: info@resource-recycling.com
- *Waste Age* — <www.wasteage.com> Phone: 866 505-7173 Fax: 402 293-0741 Mailing address: Waste Age, 2104 Harvell Circle, Bellevue, NE 68005 E-mail: wecs@pbsub.com
- *Waste News* — <www.wastenews.com/headlines.html> Phone: 800-678-9595 or 313-446-0450 Fax: 313-446-6777 Mailing address: Waste News, 1725 Merriman Road, Akron, Ohio 44313 E-mail: subs@crain.com

Chapter 5. Waste Reduction, Buying Recycled, and Manufacturing with Recovered Materials

Incorporating waste reduction activities, buying products that contain recycled materials, and manufacturing your own products with recovered materials are all activities that can enhance your tribe's solid waste management program and offer substantial benefits in life quality and economics. These activities reduce the amount of waste requiring disposal and help conserve and protect natural resources.

This chapter will review tools that your tribe can use to start or expand residential and commercial waste reduction programs and businesses on the reservation. The case studies highlighted throughout this chapter illustrate both the challenges encountered by tribes in setting up these programs and the significant benefits that you can achieve. Complete reference and ordering information for all materials cited in this chapter are provided in the Resources section at the end of this chapter.

Why Tribes Set Up Waste Reduction Programs

Native American tribes and Alaskan Native villages have a long-held tradition of land and resource stewardship. The story of the Acoma Pueblo pot demonstrates the role that recycling has played in this tribe's culture. Pueblo Indian women crafted pots out of clay, which lasted for years. When the pots eventually broke, they were not thrown away. Rather, the broken pots were crushed to a fine clay powder. Tribal members soaked the powder to soften it to a workable clay consistency and used the "recovered" clay to make new pots.

Source reduction, recycling, and composting all fit under the umbrella of "waste reduction" activities.

Tribes today have taken the simple concept of waste reduction and applied it in new ways. Many tribes are now running successful recycling programs on their reservations. Recycling and composting divert materials from the waste stream and reduce disposal costs. These potentially valuable materials also can supply your tribe with manufacturing feedstocks, which can lead to business development and job creation. Starting and expanding businesses on the reservation offers members enhanced flexibility for family and cultural activities, generates income, and contributes to the tribe or village's economic health and development. Source

reduction activities, including purchasing durable, long-lasting goods and seeking products and packaging that are as free of toxins as possible, can help your tribe or village reduce both the amount and toxicity of the waste it generates, so you save money through avoided purchasing and waste management costs.

Through recyclables collection programs, some tribes have gathered materials to make new products for the tribe or to sell to other communities. Through composting programs, tribes can make a soil amendment product they can use on farms and gardens to help plants grow and thrive. Through source reduction programs, tribes can protect health by using less toxic materials and save money by purchasing fewer products. You can focus on one aspect of waste reduction or combine elements from a variety of resource conservation programs. Numerous examples of tribal source reduction, reuse, recycling, purchasing, and recovered materials manufacturing programs are featured throughout this chapter.

Eastern Band of Cherokee Indians' recyclables management area.

Setting Up a Materials Collection Program

You can set up a variety of recyclable materials collection programs. Your tribe can design a residential recycling program to collect and process recovered materials generated by tribal residents and businesses and market these materials to end users.

Before you set up a tribal recycling program, you will want to determine:

- What materials are in your waste stream, and which of these should you recycle?
- What markets exist for collected materials?
- What type of collection program best suits the community?
- What will the program cost, and how will it be funded?
- Who will collect the materials, and where can you take the collected materials?
- Who will staff the recycling program?
- How can you encourage residents to participate in the recycling program?

What Materials in Your Waste Stream Should You Recycle?

When developing a waste reduction program, the first step is to determine what type of discards your tribe or village is generating and in what quantity. A waste characterization study will help you determine the waste stream composition by identifying waste types and volumes, existing waste management practices (e.g., reuse, recycling, disposal), and associated costs. It will help identify which portions of the waste stream you can effectively recycle, reduce, or eliminate all together.

For example, the Quechan Indian Tribe in Arizona monitored its waste stream composition and found that paper products made up the bulk of the waste discarded in landfills. Using these findings, the Quechan Tribe set waste reduction goals and priorities based on the specific materials that were being generated and thrown away. Once you have this information, you can identify the extent to which each element in the waste stream can be recovered and recycled. For more infor-

mation on conducting a solid waste stream analysis, refer to Chapter 2.

What Markets Exist for Collected Materials?

After your tribe has analyzed its waste stream, you can decide what materials to target for recycling. Typically, you will want to recycle materials that members generate in large quantities for which there also is a local market or some sort of end use. Of the paper products generated by the Quechan Tribe, office paper appeared to be the most marketable material because it was very clean, although the paper varied in color and quality. The Quechan Tribe contacted potential collectors and buyers, but found none were interested in the office paper. The tribe then pursued the idea of recycling the paper itself and established a papermaking business that would not only use the recycled office paper, but also create jobs and generate income for the tribe.

What Type of Collection Program Best Suits the Community?

Various types of collection programs you can consider include:

- Drop-off centers for recyclables
- Buy-back centers
- Curbside recycling programs
- Special collection events

Drop-off Centers for Recyclables

Drop-off facilities for recyclables work best when they are located in centralized areas that members of the tribe can access easily. They are often found in locations that tribal members frequent, such as grocery stores or shopping areas, tribe-sponsored sites, transfer stations, or residential areas. The Zuni Pueblo Tribe of New Mexico set up nine recyclables collection centers in areas frequented by tribal residents and established a processing and marketing system for the materials it collected. At drop-off centers, you can use labeled bins or containers to collect a wide range of recovered materials, from newspapers and cardboard to glass, aluminum, and steel containers. The Zuni Pueblo takes the plastic, newsprint, aluminum, and glass the tribe collects to nearby processing centers. For widely dispersed populations, a drop-off center might be the most economically feasible option for collecting recyclable materials.

Buy-Back Centers

Buy-back centers are commercial operations that pay tribal members for recovered materials. They can include scrap metal dealers, aluminum can centers, or paper dealers. Generally, buy-back centers collect materials that have a high market value.

Although few tribes are currently making use of buy-back centers, they remain feasible options in some areas. For example, tribes located in one of the 10 states with a bottle bill container redemption program can receive a refund of 5 to 10 cents for aluminum beer and soda containers at a local buy-back center. The Shoshone-Paiute

The Eastern Band of Cherokee Indians bale its recyclables to reduce transportation costs and simplify handling.

Tribes of the Duck Valley Reservation in Idaho and Nevada, for example, pays residents for aluminum cans brought to its transfer station for recycling. Other tribes are looking toward establishing their own buyback centers on their reservations.

Curbside Recycling Programs

Collecting recyclable materials at the curbside is most convenient for residents and thus can lead to higher recovery rates. Curbside collection also is a more expensive collection option, as the tribe has to pay workers to collect the materials and purchase and maintain trucks and other equipment to transport the materials to a recovery facility. In spite of these costs, some tribes have found curbside collection is worth the price. The Confederated Tribes of the Umatilla Indian Reservation, for example, collected nearly 40 tons of corrugated cardboard, paper, and steel for recycling in 2001 through its curbside collection program and centrally located collection bins. The relative ease of curbside collection for tribal members is helping the tribe work toward its 35 percent recycling goal.

Special Collection Events

To collect more recyclables, you also might institute special recycling events in conjunction with curbside or drop-off collection programs. These events can include special recovery days for large items or household hazardous waste. The Fort Peck Reservation in northern Montana holds an "Annual Spring Cleanup Week," during which almost everyone on the reservation mobilizes to pick up litter, remove junk cars and furniture, and properly dispose of recyclables and waste. The tribes also use the cleanup, which prepares the reservation for tourist season, as an event to bring the community together.

When examining the various collection options, consider which system is likely to work best in your area. Factors that might impact your collection option choice include your tribe's population density, the availability and distance to markets for recovered materials, what transportation options are available, the volume of materials residents generate, how interested tribal residents are in recycling, and whether appropriate funding and staff are available to work on the recyclable collection program. For more information on tribal collection options, refer to Chapter 4, and for information on revenue from recycling, refer to Chapter 7.

What Will the Program Cost, and How Will It Be Funded?

Recycling programs, like waste collection and disposal programs, cost money to set up and run. The amount of funding your tribe has available will affect the type of collection program you implement. You might be limited by how much tribal members are willing to pay for recyclables collection services. In addition, if a tribe is located in a remote area or has a small population, the economic feasibility of the recycling program might be limited, especially given other tribal concerns. When weighing the costs and benefits of a recycling program, you might want to consider the extent to which you can build support for and encourage program participation.

The major costs of a tribal recycling program are capital costs to set up the program, and operation and maintenance costs to keep the program running, such as new equipment purchases and staff salaries. Money to pay for these expenses can come from user fees, tribal general funds, and some federal and state grants and loans.

Grants and loans are good tools to help a tribe get a recycling program off the ground. After receiving a grant from the Oregon Department of Environmental Quality and providing matching funds of their own, the

Confederated Tribes of the Warm Springs Reservation in Oregon started a recycling program on the reservation. Since receiving the funding, the tribes were able to expand from an aluminum can-only recycling system to recycling a greater variety of materials and reducing the amount of materials sent to the landfill. Many federal grants have limitations on how their money can be spent. Many grants, for example, can not be spent on program operation and maintenance. For this reason grants might be a good source of startup funding, but should not be relied upon for program maintenance. For more information on financing a recycling program, including sources of grants and funds, refer to Chapter 7.

Who Will Collect the Materials, and Where Can You Take the Collected Materials?

While developing the technical aspects of the recyclables collection system, you might want to evaluate the role your tribal government and private waste management companies play. Some tribal leaders might decide that tribal government should handle all aspects of recyclables collection, while others might advocate contracting with a private hauler. You might be able to obtain collection services at a lower cost by bidding out services to different private companies. The Fond du Lac Band of Lake Superior Chippewa in Minnesota hired several private waste haulers to collect waste for the tribe. The tribe also has studied the feasibility of tribally operated waste hauling services.

If your reservation is very large, you might issue separate contracts to private companies for different geographic regions. If any nearby tribal or non-tribal communities are interested in recyclables collection services, you can work with these communities to provide recyclables collection services on a regional basis. Regional collection systems are particularly cost-effective if several small tribal communities located close to each other can use the same collection or disposal site.

How Can You Encourage Residents to Participate in the Recycling Program?

If the program is new for the tribe, then convincing tribal members to practice recycling habits might take time. The success of a recycling program will depend on early community involvement, followed by continuing educational efforts. Start by showing members how a recycling program can benefit the tribe. Gauge members' interest in recycling and their concerns about how a recycling program will work. Being responsive to members' input and providing clear information will go a long way toward ensuring a program's success.

One of the best ways to ensure strong participation in your tribal recycling program is by introducing recycling to schools. Not only can schools serve as focal points for collection, but they also can instill a recycling ethic in children. The children, in turn, will take the recycling message home, encouraging parents and other tribal elders to participate in tribal recycling events. When the Nez Perce Tribe of Idaho received a grant from USDA to fund a tribal recycling program, one of its first steps was to go to the schools. The Lapwai grade school was designated as a recyclables drop-off center. Educators worked with fifth and sixth graders to teach them about recycling and instituted a Saturday afternoon class covering various environmental issues for elementary schoolchildren. The tribe invited professionals from natural resources fields to teach the children about environmental conservation. Chapter 6 has more information about setting up a recycling educational program for tribal members.

Beyond Recycling: Source Reduction, Reuse, and Composting

Because recycling is now entrenched in many states and communities across the nation, it is often the first waste reduction effort considered by tribes. There are, however, many other ways for tribes and Alaskan Native villages to practice waste reduction. Many of these activities are simple to implement and do not require large amounts of funding or a complex infrastructure.

What You Can Do To Reduce Waste

- Use less toxic products.
- Call direct mailers to remove your name from their mailing lists.
- Make duplex copies and print on both sides of the paper.
- Reuse scrap paper as message pads or sketch pads for children.
- Use canvas bags in place of plastic or paper shopping bags.
- Reduce the use of chemical fertilizers on your plants.
- Join EPA's WasteWise Program for more ideas <www.epa.gov/wastewise>.

Source Reduction/Reuse Programs

Source reduction and reuse activities can help reduce your tribe's waste management expenses by avoiding the costs associated with collecting, transporting, processing, and disposing of discards. Source reduction and reuse programs, which include materials exchanges and backyard composting, also conserve resources, such as water and energy, and reduce pollution, including greenhouse gases that contribute to global climate change. Source reduction also can help reduce the toxicity of a tribe's waste stream by discouraging use of products containing toxic materials, such as cleaning products and pesticides.

Source reduction activities are an important part of the Mohegan Tribe's waste management program. In 1997, the Connecticut-based tribe established an integrated waste management program for the Mohegan Sun Casino and the tribal government. The program emphasizes source reduction activities, along with recycling, over waste disposal options. The tribe practices water-conserving irrigation methods and uses native rather than ornamental plants in landscaping. Native plants are well adapted to their environment, which means they require less water, fertilizers, and pesticides for their maintenance. The tribe also has minimized its chemical use, switching to less toxic products where possible.

A number of resources are available to tribes that can help them in their source reduction efforts. Smith River Rancheria in California joined EPA's WasteWise Program in 2001 and began implementing source reduction activities immediately. The tribe's receptionist returns unwanted direct mail solicitations and calls or writes to companies requesting removal from mailing lists. Posters in the tribal office remind staff about the duplex printer feature, and tribal council members and office staff copy meeting minutes and other documents on both sides of the paper.

Reuse also can be a good alternative to disposal for those materials for which recycling markets are located far away. In the isolated village of Kotzebue, Alaska, several businesses and organizations collect scrap office paper. Every few weeks, the businesses deliver this paper to tribal schools, local daycare centers, and children's homes for reuse.

The severe weather conditions in Alaska also have led to creative source reduction and reuse activities. In Galena Village, Alaska, winds blew hundreds of white plastic shopping bags around the community, which

became entangled in nearby trees, clung to the frozen tundra, or choked and entangled local wildlife. The Tribal Council passed a resolution prohibiting the three local stores from using plastic shopping bags. At first, the store owners were apprehensive about the ordinance, wanting to know what alternatives would be available to them. The council worked with store owners to identify alternatives, such as brown paper and reusable canvas bags, and explained the environmental benefits. Once they found alternatives, local merchants accepted the change.

Source reduction and reuse practices can be easy for your tribe to adopt. Tribal members of the Blue Lake Rancheria Tribe in California also practice source reduction and reuse by using the double-sided copier function whenever possible and using the back side of once-used paper for drafts. These simple activities have helped the tribe save money by cutting down the amount of paper purchased.

Materials Exchange Programs

A materials exchange is a reuse program that offers a market for buying and selling reusable and recyclable commodities. Materials exchange programs help tribes redirect unwanted materials to potential users. Materials can be offered for free or for a price, typically below the market value of the goods or materials being offered. Tribal members that contribute materials for sale or donation save time and money by not having to dispose of the unwanted materials, and purchasers benefit by obtaining goods or materials at no cost or for a nominal fee.

Examples of materials exchanges that tribes use include:

- Reuse centers, secondhand stores, or flea markets where residents donate or sell unwanted goods to others.
- Physical warehouses that advertise available commodities through catalogs.
- Computer listings or Web sites that connect buyers and sellers.
- Informal word-of-mouth communications.

Many tribes schedule events or set up temporary or permanent reuse centers where tribal residents can donate products and materials that they no longer need. The collected materials are then made available to tribal schools, senior centers, or other tribal residents. Some tribes establish and run secondhand stores or swap meets, where residents can donate or sell their used materials instead of throwing them away.

The Pine Ridge Oglala Sioux Tribe holds regular "swap days." Tribal members bring items they no longer want to a central location, where they swap or sell them to each other in a flea market-like setting. The Oneida Tribe of Indians in Wisconsin has found it beneficial to hold a week-long clothing and household item exchange. In one week, tribal members donated 770 pounds of clothing and 1,300 pounds of miscellaneous household items for reuse by other members of the tribe. At the end of the week, the tribe transported leftover items to other reservations in the state.

The Alaska Materials Exchange (AME) is an information clearinghouse to help Alaskan businesses reuse products and materials and find alternatives to throwing valuable materials into local landfills. Through quarterly catalogs, AME lists surplus and unwanted material from one company that others can use. The materials exchange is a service of the state Department of Environmental Conservation in cooperation with BP Exploration and ARCO Alaska, Inc. Since 1994, AME has saved Alaskan businesses more than $1.4 million in disposal costs. Currently, AME has more than 100 listings and a subscriber list of 2,500 organizations.

Tribes where the majority of residents have access to computers also might want to set

up a computer network or brochure listing materials that tribal members or businesses no longer want that other members of the tribe could use. Materials listed can include manufacturing or construction materials, such as wood, textiles, or concrete. Tribal members also may choose to list appliances, office or home furnishings, or computers in their materials exchange.

Tribes do not need high-tech capabilities to put a materials exchange program in place. The Confederated Tribes of the Umatilla Indian Reservation in Oregon maintain a more informal materials exchange program. The tribal government operations manager e-mails tribal employees when residents bring in used items to exchange. The tribal employees then inform community members that items are available for reuse.

Composting Programs

Composting is the controlled decomposition of organic materials, such as leaves, grass, and food scraps, by microorganisms. The result of this decomposition process is compost: a crumbly, earthy-smelling, soil-like material. Your tribe can use compost material in its gardens and other landscaping applications or sell it to individuals or businesses outside the tribe for a profit. Two types of composting programs you can set up include:

- Residential backyard composting programs
- Community composting facilities

In a residential backyard composting program, tribal members leave cut grass clippings on their lawn and collect other yard trimmings and gather them into a backyard mulch pile. You can teach members how to

Eastern Band of Cherokee Indians' composting operations. Top: windrow turner aerates the piles to increase decomposition. Bottom: watering the piles helps maintain the proper moisture levels.

compost and can offer composting bins to residents to encourage the practice. The Oneida Tribe of Indians in Wisconsin sells backyard composting bins to residents to promote backyard composting among members and also teaches adult education classes on backyard composting. Through practicing backyard composting, residents will have less trash to dispose of and will gain a soil amendment product that will improve the consistency of the soil in their own gardens.

If your tribe chooses to establish a community composting facility, residents can leave yard trimmings at the curbside for collection or drop them off at a designated site. Factors you might consider when selecting a drop-off site are similar to those for choosing a recyclables drop-off site, including convenience for tribal members and low impact of odors, dust, or noise on tribal members. You will need to train and hire staff to run your facility. One factor that contributed to the success of the Eastern Band of Cherokee Indians' pilot casino composting program in North Carolina was integrating the composting process into employee training and routine procedures at the casino. The tribe also hired an additional employee to handle some of the composting responsibilities.

You can use the compost you produce for landscaping projects on your reservation. If you control and document the composition and nutrient content, then you can sell its compost to farms, nurseries, or greenhouses in the area and use the profits to fund other tribal activities.

Tribal and village businesses also can participate in composting programs, with the added benefit that they will contribute larger quantities of materials. Sitka Tribal Enterprises in Alaska designed a composting program to produce marketable products from organic wastes of Alaskan industries. Aerated, turned windrows produce high-quality, nutrient-rich, organic, soil-like compost from fish and timber wastes. The result is certified organic products, such as potting soil and transplant mix, from Alaska's own land and water. The project has provided jobs for village residents and serves as a model for other Alaskan Native communities.

The Eastern Band of Cherokee Indians use a tub grinder to chop branches and brush for composting.

Buying Recycled Products and Manufacturing with Recovered Materials

Materials collected through recycling and composting programs need to be made into products in order for the recycling process to be considered "complete." More and more products are now available that have been made from recycled materials. Buying these products on an individual and tribal level can help support the demand for these materials in the marketplace and thereby enhance the viability of tribal recycling programs. Additionally, some tribes themselves have been successful in "closing the recycling loop" by establishing their own businesses to use the materials they collect. These businesses, in turn, provide both revenues and jobs for tribal members.

Buy-Recycled Programs

For most of the products that tribal employees and residents purchase, there probably is

Tribal Business Waste Reduction Programs: Targeting Hotels and Casinos

Approximately 400 hotels, motels, and resorts and 200 casinos and bingo halls are located in Indian country. These facilities generate a tremendous amount of solid waste, from food scraps, glass containers, and metal cans to plastics, paper, and cardboard. Tribal hotel and casino operators can prevent waste when purchasing supplies and food, serving customers, and cleaning guest rooms, and many have found these actions also have the economic benefit of reducing purchasing costs and disposal fees.

The Eastern Band of Cherokee Indians in western North Carolina started a pilot project to compost food scraps from its casino and three restaurants after they opened in 1997. The tribe collects more than 1,200 pounds of food scraps each day from the casino and restaurants for composting. The tribe sells the final compost product to landscapers, nurseries, and homes both on and off the reservation.

The Lac du Flambeau Band of Lake Superior Chippewa Indians developed a pilot waste reduction program for the Lake of the Torches Casino on its reservation in north-central Wisconsin. Initially, the tribe undertook a waste characterization study to determine its waste stream composition. The tribe found that cardboard made up 70 percent of the waste stream by weight, and food and paper was another 12 percent. The tribe has three goals: reduce the amount of waste generated; reuse rather than discard items; and recycle as much of the remaining waste stream as possible. The tribe met with several challenges while developing its waste reduction program. The casino struggled to reduce cardboard waste, since most of the cardboard came from packaging sent by outside suppliers, so it reused many of these boxes internally to avoid recycling or landfilling them. The casino worked with its hauler to collect and weigh recyclables regularly and document their destination. In addition, the casino instructed employees how to prepare and separate recyclables to the hauler's specifications. The tribe's waste reduction plan included purchasing supplies in bulk to reduce packaging waste; using washable rather than disposable dinnerware and utensils; and, replacing individually bottled cleaning supplies with a central housekeeping supply station stocked with nonhazardous cleaners purchased in bulk.

The Grand Traverse Band of Ottawa and Chippewa Indians in Michigan wanted to teach its hotel, casino, and restaurant managers how to recycle, prevent waste, and buy recycled-content products. Tribal environmental department staff worked with businesses to insert waste reduction education into new employee welcome packets. The tribe also reduced waste during hotel renovation projects by donating old furniture and fixtures to residents and local businesses.

a recycled-content alternative. Recycled-content products not only are typically of the same quality as products made from virgin materials, but they also can cost less money. Buying recycled sends a message to manufacturers that recycled products are in demand, which helps ensure that the materials the tribe is recovering are being put to good use. When tribal members buy recycled products, they help expand the markets for recovered materials. Tribal businesses that manufacture products from recovered materials can provide jobs for tribal members and revitalize local economies.

Setting Up a Buy-Recycled Program

Tribal governments purchase everything from office paper to construction materials. You can set a positive example for your members by instituting a buy-recycled program. Key elements to setting up a buy-recycled program can include:

- Setting purchasing specifications to include recycled content
- Establishing recycled-content standards
- Giving preference to recycled products

Set Purchasing Specifications To Include Recycled Content

Tribal purchasing officials can review product and service specifications or policies to identify and eliminate any provisions that require the use of virgin-content products or that exclude the use of recycled-content products. Smith River Rancheria in California, which purchases recycled-content copier paper, calendars, pencils, envelopes, and file folders, conducted a purchasing audit. This audit identifies the products the tribe is purchasing that are made from virgin materials and helps it find recycled-content alternatives.

Establish Recycled-Content Standards

Many government agencies have established voluntary or mandatory minimum recycled-content standards that apply to their own purchases of certain goods and materials. Your tribe can use these standards as a guide in developing your own standards. Guidelines can vary on the minimum percentage of recycled materials required in specific products. For instance, the recycling coordinator for the Confederated Tribes of the Umatilla Indian Reservation in Oregon asked the tribal purchasing department "to make every effort" to purchase recycled-content products where possible.

The purchasing department for the Confederated Tribes of the Umatilla seeks out vendors that sell recycled-content products. In 2001, for example, the tribe purchased one thousand 100-percent recycled content toner cartridges and other recycled content items including paper, boxes, pallets, drums for storing hazardous materials, and totes. "At first, [purchasers] were hesitant to buy recycled content products because they were concerned about quality," said Teddi Bronson, recycling coordinator for the tribe. "But after purchasing recycled products, they realized they were as good as the products they purchased before."

Closing the Loop

The recycling symbol has three chasing arrows. Each arrow represents one step in the recycling loop.

- The first arrow is the collection step. This is when you put your recyclable materials into your curbside recycling bin or take it to a local drop-off center. The collected materials then can be taken or sold to a manufacturing facility.
- The manufacturing process is the second arrow in the recycling symbol. The recyclable materials are converted into new products and shipped to stores.
- The third arrow represents the step where the consumer purchases products made with recycled content.

When you "buy recycled," you close the recycling loop.

Give Preference to Recycled Products

With current technologies and scales of production, some recycled-content products cost more than their virgin competitors. Eventually, prices for recycled products might be competitive with prices of products made from virgin materials, but until then, recycling activities can be supported by price preferences for recycled-content products. A typical price preference can cost out recycled-content products at 5 to 10 percent lower cost than comparable virgin products.

Even without price preferences in place, tribal recycling coordinators are finding that businesses and residents are still buying recycled, once they are educated about it. "Our tribal members buy recycled because it protects the environment," Bronson said. "That is the benefit they see to buying recycled."

Your tribe also can establish buy-recycled cooperatives with other, neighboring tribes, local governments, or organizations. The Grand Traverse Band of Ottawa and Chippewa Indians, for instance, partnered with two neighboring tribes so that they could increase their purchasing power to encourage the production and sale of recy-

cled-content products. To set up such a cooperative, tribal leaders/purchasing agents can contact neighboring tribes, determine what purchases they have in common, and agree to purchase these products in recycled-content from a vendor that can supply the highest-quality recycled-content product at the best price.

Manufacturing with Recovered Materials

Some tribes, like the Hopi Tribe in Arizona, have found new business opportunities and helped create jobs for residents through manufacturing with recovered materials. The tribe's unemployment rate had often caused residents to seek jobs as far away as Phoenix, more than 200 miles from the reservation. The tribe received an Inter-Tribal Council of Arizona grant to fund solid waste management planning on the reservation.

Gentle Rain Designs, organized under the Hopi Foundation, a local organization with a mission to "foster self-reliance, self-sufficiency, and a sense of pride," in tribal members, received a $16,000 startup grant from the Arizona Department of Commerce. Gentle Rain Designs creates and sells garments featuring cultural designs, made of fabric produced from recycled polyethylene terephthalate (PET) from 2-liter soda bottles. Tribal members expanded production to include fleece jackets and vests. Tribal members employed by this operation have the freedom to work out of their homes and set their own schedules. In addition, the Gentle Rain Designs workers generate products that not only serve to artistically preserve Hopi culture, but also, thanks to their recycled content, help to preserve the environment.

Gentle Rain Designs has successfully marketed its business in outdoor industry trade magazines and at Native American events, art shows, outdoor retailer shows, and other recycled products trade shows. In addition, the company has expanded its partnerships, receiving support from the Grand Canyon Trust, the First Nations Development Institute, and Arizona Community Foundation. "When you demonstrate ability, organizations come looking for you," said Mike Puhuyesva, director of solid waste for the Hopi Tribe. "You no longer have to go out and seek money with grant proposals; it comes in."

Chapter Highlights

- Use waste assessment results to identify potential for recycling and opportunities for source reduction, or composting.
- Identify markets or end users for recyclables, compost, and other exchangeable materials.
- Use community outreach and education to educate and energize tribal members about your tribe or village's waste reduction programs and increase participation.
- Buy recycled-content products to close the recycling loop.
- Manufacture with recovered materials to stimulate markets for recyclables, create jobs, and generate revenue.

Resources

A variety of additional resources are available to help tribes reduce, recycle, compost, purchase recycled products or manufacture with recovered materials:

Publications

EPA's *Recycling Guide for Native American Nations* (EPA530-K-95-006), provides information for tribes developing recycling programs. Available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/ntverecy.pdf> or by contacting the RCRA/Call Center at 800 424-9346.

EPA's *Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities* (EPA530- C-01-002) highlights the actual operating experience of 30 diverse communities. The report is available on the Collection of Solid Waste Resources CD free of charge from the National Service Center for Environmental Publications at 800 490-9189. Information for ordering by mail or fax is available at <www.epa.gov/epaoswer/osw/cdoswpub.htm>.

A Native American Agenda for Action: Solid Waste Management in the 1990s, published by EPA Region 6, describes the scope of the solid waste problem in Native American communities and offers solutions. To order a copy, contact EPA Region 6 at 214 665-6760.

EPA's *Source Reduction Program Potential Manual* (EPA530-R-97-002), describes six source reduction options (grasscycling, home composting, clothing reuse, office paper reduction, converting to multi-use pallets, and paper towel reduction) to help solid waste managers determine the potential impacts of source reduction on their solid waste program. Available on the Web at <www.epa.gov/epaoswer/non-hw/reduce/source.pdf> or by contacting the RCRA Call Center at 800 424- 9346.

EPA's *Composting Yard Trimmings and Municipal Solid Waste* (EPA530-R-94-003), examines planning, siting, designing, and operating composting facilities. Available on the Web at <www.epa.gov/compost/cytmsw.pdf> or by contacting the RCRA Call Center at 800 424-9346.

EPA's *Waste Reduction Tips for Hotels and Casinos in Indian Country* (EPA530-F-00-007), shows how tribes can set up a waste reduction program on tribal casinos and highlights successful tribal programs. Available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/casinotips.pdf> or by contacting the RCRA Call Center at 800 424-9346.

EPA's *Business Guide for Reducing Solid Waste* (EPA530-K-92-004), provides instructions for performing a waste audit — useful for businesses and governmental organizations establishing a waste reduction program. Available on the Web at <www.epa.gov/epaoswer/osw/publicat.htm> or by contacting the RCRA Call Center at 800 424-9346.

EPA's *Climate Change and Waste: Reducing Waste Can Make a Difference* (EPA530-E-03-002), explains how preventing waste and recycling can help reduce emissions of green house gases that cause climate change. Available on the Web at <yosemite.epa.gov/oar/globalwarming.nsf/content/actionswastefactsheets.html> or by contacting the RCRA Call Center at 800 424-9346.

Download the Alaska Materials Exchange Catalogue at <www.state.ak.us/local/akpages/ENV.CONSERV/pubs/ame.pdf>, or for more information contact the Compliance Assistance Office in Anchorage at 907 269-7586.

Periodicals

The following periodicals provide information on innovative and successful waste reduction practices and strategies.

- *BioCycle* — <www.biocycle.net> Phone: 610 967-4135 Mailing address: The JG Press, Inc., 419 State Avenue, Emmaus, PA 18049 E-mail: biocycle@jgpress.com
- *MSW Management* — <www.forester.net/msw.html> Phone: 805 682-1300 Fax: 805 682-0200 Mailing address: Forester Communications, Inc, P.O. Box 3100, Santa Barbara, CA 93130
- *Resource Recycling* — <www.resource-recycling.com> Phone: 503 233-1305 Fax: 503 233-1356 Mailing address: Resource Recycling, P.O. Box 42270, Portland, OR 97242-0270 E-mail: info@resource-recycling.com

- *Waste Age* — <www.wasteage.com> Phone: 866 505-7173 Fax: 402 293-0741 Mailing address: Waste Age, 2104 Harvell Circle, Bellevue, NE 68005 E-mail: wecs@pbsub.com
- *Waste News* — <www.wastenews.com/headlines.html> Phone: 800-678-9595 or 313-446-0450 Fax: 313-446-6777 Mailing address: Waste News, 1725 Merriman Road, Akron, Ohio 44313 E-mail: subs@crain.com

Web Sites

Environmentally Preferable Purchasing: <www.epa.gov/oppt/epp> EPA's Environmentally Preferable Purchasing Web site has links to contracts that federal agencies have set up to purchase specific recycled-content products.

Energy Star: <www.energystar.gov> EPA's EnergyStar Program promotes the use of energy-efficient products and services. EnergyStar can help tribes, businesses, and consumers find energy-efficient solutions, including tools to help measure current energy performance and estimate potential for improvement.

EPA's Comprehensive Procurement Guidelines (CPG): <www.epa.gov/cpg> The CPG Program promotes federal purchase of recycled-content products. The CPG Web site includes information on the CPG and EPA's Recovered Materials Advisory Notices (RMANs) that can recommend recycled-content levels for CPG items to tribes.

EPA's WasteWise Program: <www.epa.gov/wastewise> WasteWise is a free, voluntary, EPA program through which tribes and Alaskan Native villages, communities, and organizations can work to eliminate waste, benefitting their bottom line and the environment. The WasteWise program can help partners design their own solid waste reduction programs tailored to their needs.

Department of Energy's Federal Energy Management Program (FEMP): <www.eren.doe.gov/femp> FEMP works to reduce the cost and environmental impact of the federal government by advancing energy efficiency and water conservation, promoting the use of distributed and renewable energy, and improving utility management decisions at federal sites. Interested tribes can use this resource as well.

Resource Conservation Alliance (RCA): <www.rca-info.org/gpp.html> RCA's mission is to protect natural forests and other ecologically important systems through market- and commodity-based conservation strategies, including reduced consumption and increased recycling, redesign, and resource diversification. The RCA list of Web links of EPP programs including federal, state, local, and green building programs that tribes can learn from.

50 Ways to Save the Environment: <www.justgive.org/html/guide/50ways environment.html> This Web site covers activities that people can do in their home, car, and yard; at work; and when they are shopping to protect the environment.

Web sites that connect buyers and sellers of recovered materials:

- Recyclers' World: <www.recycle.net>
- Used Building Materials Exchange: <http://build.recycle.net/exchange/>
- Resource Exchange Network for Eliminating Waste (RENEW): <www.tnrcc.state.tx.us/exec/oppr/renew/renew.html>
- RecycleXchange: <www.recyclexchange.com>
- Washtenaw County Materials Exchange: <www.co.washtenaw.mi.us/depts/eis/eisex.htm>

Chapter 6. Public Education and Community Outreach

Public education and community outreach are integral parts of any tribal solid waste management program. Well planned education and outreach initiatives can help generate understanding and support for waste management issues in your tribe. They also can be used to teach residents how to comply with waste management and recycling activities to the overall benefit of the tribe.

This chapter describes steps a tribe or Alaskan Native village can take to design an effective education program. Examples of tribal education efforts are provided throughout the chapter. Additionally, the chapter presents strategies for crafting an education program specifically designed to decrease illegal dumping and use of burn barrels. Appendix C includes sample public education tools tribes have used. The Resources section at the end of this chapter provides complete reference and ordering information for the documents cited in this chapter, in addition to other outreach and education-related resources.

Designing an Effective Education Program

Designing an effective public education campaign requires both funding and expertise. As described in this chapter, you can often find creative, low-cost ways to accomplish your education goals, even if you have a small staff or a limited budget. The main steps to consider in designing an effective education program are:

- Identifying your goals and audiences
- Crafting a clear and useful message
- Choosing an outreach method
- Creating incentives and deterrents

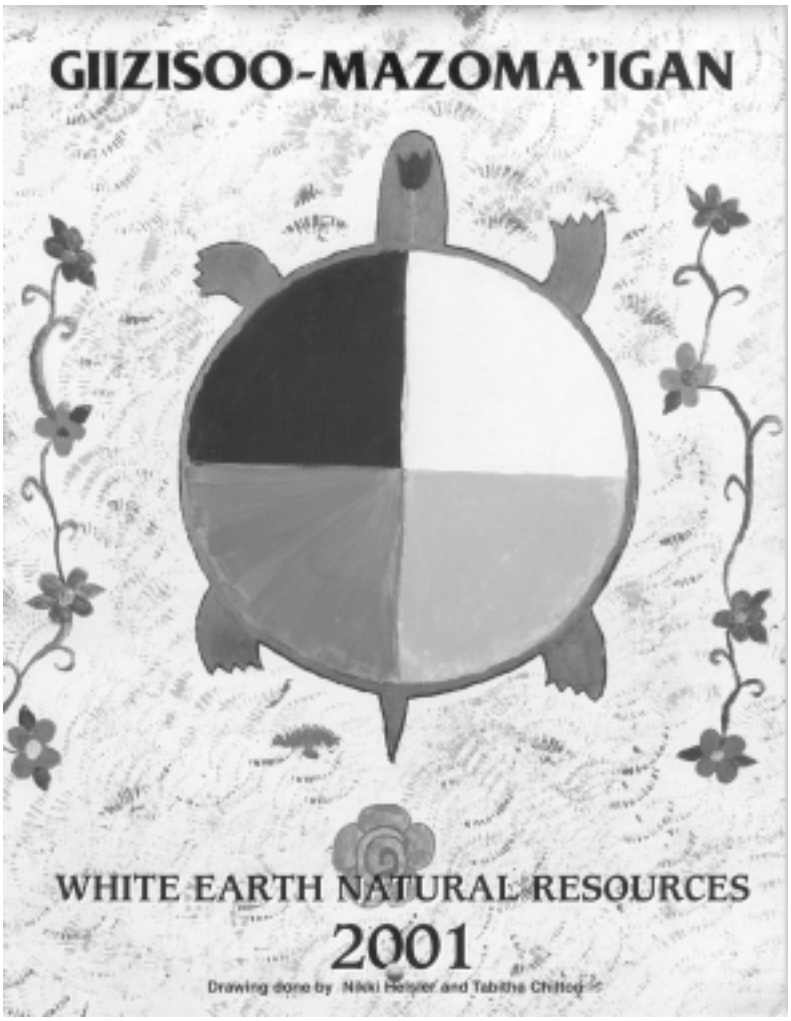
Working through these steps does not need to be time- or resource-intensive. In fact, you probably have considered some of these issues already. But thinking through these steps in a methodical way can help ensure that your resources are well spent and your program has an impact. For additional technical assistance, consider contacting the tribes whose educational programs are highlighted in this chapter for their advice. For financial assistance, refer to Chapter 7 for ideas on getting the funding and other

resources necessary to implement public education efforts.

Identify Your Goals and Audiences

Before you begin an educational campaign, it is useful to clearly identify your outreach goals, keeping in mind your overall solid waste management program objectives. For example, if an overarching goal of your waste management program is to reduce illegal dumping on the reservation, the objective of your outreach might be to: 1) educate tribal members about the causes and effects of illegal dumping, 2) encourage tribal members to change behavior to avoid illegal dumping, and 3) encourage tribal members to report any incidents of illegal dumping that they witness.

The White Earth Band of Chippewa distribute calendars as part of its outreach program.



Your outreach goals are closely linked to, and often define, your target audience. Depending on your goals, you might be directing your message to any or all of the following sectors of the tribal population: illegal dumpers, schoolchildren, tribal offices that produce waste, tribal businesses and industries, or other individuals. You might also need to reach audiences beyond the reservation— for example, illegal dumpers that are not tribal members.

In some cases, you also might need to direct your efforts towards the tribal staff responsible for implementing waste management laws and programs. Education can help ensure that staff fully understand their role and what is being asked of tribal members under a program.

Craft a Clear and Useful Message

Once you have defined your goals and target audiences, consider the specific messages you want to impart to achieve your objectives. Messages are simply the ideas or information you want to communicate. They should be clear, concise statements that can be repeated every time you communicate. Generally, you do not want to overwhelm your audience with too much information, so you might limit yourself to three or four simple messages, using language that speaks to the audience.

To craft effective messages, you might ask yourself the following questions:

- Why are you interested in educating the tribal community?
- What does the tribal community need to know?
- What would you like tribal members to do?

- What other information can you provide that might act as an incentive or deterrent that will encourage tribal members to do what you would like them to do?

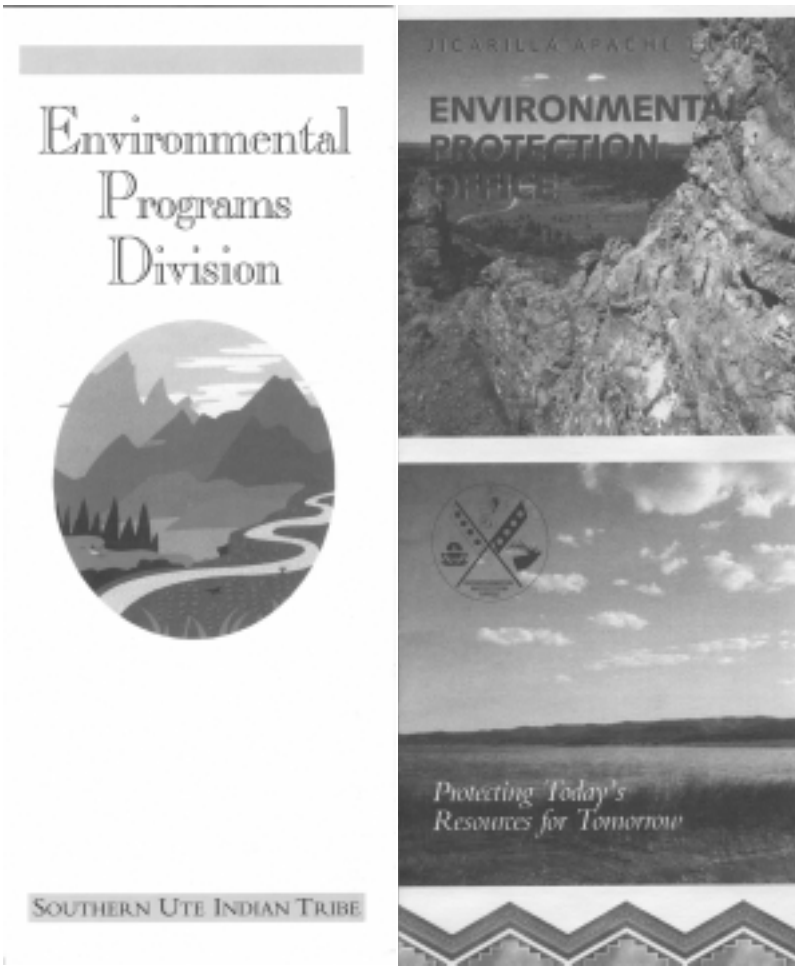
As you develop your messages, keep in mind your target audiences and how they will perceive and respond to your messages. Consider such issues as:

- What are their core values?
- How do they process information?
- What motivates them to take action?

In addition, consider any factors that could influence how receptive your target audiences will likely be to your information. For example, will they bring preconceived notions to the issue? Are there historical or tribal sensitivities surrounding the issue? Are there greater priorities or competing channels of information that could detract or undermine your messages? Keep in mind that you will likely need to tailor your message so that it appeals to different audiences.

As you are developing messages, remember that it is important to teach tribal members why new laws and new programs are in place and why they need to handle and dispose of their waste in a particular way. When tribal members understand why certain waste management practices are bad for public health, the environment, and wildlife, for example, they are more likely to handle their waste differently.

Without this type of explanation, residents might be more resistant to change. For example, tribal members might be more likely to stop burning trash if they learn that the pollution from burning is bad for their health. Similarly, they might be more likely to stop illegal dumping if they learn that the pollution created by open dumps can contaminate the water they drink or poison the fish they eat.



Examples of outreach brochures from the Southern Ute Indian Tribe and Jicarilla Apache Nation.

Choose an Outreach Method

The next step is to determine the best way to get your message to your target audiences. You might already have a clear sense of the preferred information dissemination channels in your tribe. For example, perhaps your tribal newsletter is widely read or a particular radio station is popular. If you want input on your audience's preferences, you can hold informal discussions with tribal members or perhaps convene a focus group of representatives of different segments of the tribal community, including business leaders, residents, teachers, and government officials.

Consider more than one method for conveying your information. Your outreach messages

are likely to have more impact if they are heard more than once. You might do an initial outreach campaign using flyers, for example, and then follow up with an article in the tribal newsletter a couple of months later.

As you are considering the many options for distributing your message, consider the tribe's budget, staff availability, and the technical requirements of your options. When possible, consider ways to use existing tribal community outreach programs and tools to get your messages to your audiences. Frequently, tribes will not have to create their educational materials from scratch. Many existing educational resources are available from other tribes, nonprofit organizations, and non-tribal governments. Often, these materials can be used as-is or modified to fit your needs. See Appendix C for ideas.

If you do need to create outreach products specifically for your program, consider creative and low-cost ways of producing these items. For example, if you need a poster explaining what materials are accepted at your transfer station, think about sponsoring a poster contest in the school system. If you need 300 flyers for your new recycling program, consider a barter with a local printer. For example, the printer might donate its services in return for placing an advertisement for its business on the back of the flyer. When designing any outreach products for your educational program, always consider ways to incorporate elements of your tribal culture to help tribal members feel a connection to the program.

Create Incentives and Deterrents

In addition to using specific outreach tools to convey your message, consider other avenues for delivering your message that are likely to create incentives (or, in some cases, deterrents) for action. For example, some educators highlight the endorsement and support they receive from respected tribal officials or elders to increase the credibility of the messages they distribute. When leaders from the Tribal Council or Reservation Business Committee deliver messages about proper waste management and respect for the land, they can have a powerful influence on the members, creating an incentive for them to listen to your message. In addition, tribal leaders can ask tribal agencies to get involved, mobilize community support, and leverage funding and other resources.

You can create incentives to manage waste properly through public recognition of waste management "champions" or by sharing success stories with the tribal community; for example, efforts that helped increase tribal recycling rates. Another good incentive is to remind tribal members of the values and ethics that are important to the tribal community (for example, protecting the Earth and considering future generations), since these are values that can encourage them to manage waste properly.

The Red Cliff Tribe in Wisconsin significantly reduced backyard burning on its reservation through a voluntary incentive program that gives residents a chance to turn in their burn barrel and receive $20 worth of trash bags. The bags encourage tribal members to take their discards to the tribe's transfer station. When residents turn in their burn barrels, they sign a pledge acknowledging that they understand that burning trash in barrels causes harmful pollution. Program participants receive a certificate, along with 10 free trash bags.

Creating deterrents also helps discourage illegal activities that can harm public health and the environment. Publicizing new laws and associated penalties or publicizing successful convictions of illegal dumpers and levied fines can deter illegal dumping. The Seminole Nation in Oklahoma publishes newspaper articles on the consequences of breaking tribal waste management laws, lists

the names of the responsible parties, and offers rewards for information leading to convictions.

Sample Educational Tools

Education can take a variety of forms, including written materials (e.g., fact sheets, newsletters, articles, flyers, inserts, question and answer pieces); visual materials (e.g., signage, posters, slides, charts, Web sites); and events (e.g., meetings, community forums, and workshops). The following are some real-life examples of tribal public education efforts.

Signage

Signs placed in strategic locations are a low-cost, low-effort way of educating tribal members about various waste management options or regulations. They are particularly useful for no dumping and anti-litter campaigns. They also are effective when posted at transfer stations and recycling facilities to clearly explain what materials are accepted.

- The Red Lake Band of Chippewa in Minnesota strategically posted more than 25 "No Dumping" signs at accesses to off-road areas and other potential illegal dumping locations. The signs state that dumping is prohibited and punishable by a fine. They also include the pertinent tribal resolution number. The tribe keeps litter away from the "No Dumping" signs to give the message credence.

Other Written Materials (Inserts/Flyers/Articles)

Inserts and flyers are another low-cost method of spreading information. By developing a simple message and distributing it to tribal residents, the tribal leaders can impart information about waste management programs. Additionally, putting certain information in writing (e.g., materials accepted for recycling, household hazardous waste collection dates) is useful because tribal members can keep and refer to the information received.

- The Resource Management Division of the Fond du Lac Band in Minnesota periodically inserts its Environmental Program Newsletter in the tribal newspaper, to reach a large number of residents at a low cost.
- The San Carlos Apache Tribe Environmental Protection Agency in Arizona mailed a flyer to all tribal members to tell them about the tribe's new transfer station, its rates, and items it accepts. The head of the agency also writes articles on waste management issues for the local newspaper.

Door-to-Door Campaigns

Door-to-door campaigns are beneficial because tribal educators can talk directly to tribal members. A door-to-door campaign can be more time-consuming and labor-intensive than other education options, but

The Lac Courte Oreilles' transfer station sign lists the hours of operation and types of waste accepted.

it can be invaluable in reaching people, especially in situations where rules or laws have changed, or where you anticipate resistance to a new program. A door-to-door campaign also lets you hear directly what issues are important to tribal members and what questions or concerns they have. It also has an added benefit of enabling you to track every individual that you reach, thereby helping you gauge the effectiveness of your program (see section on "Carrying Out Program Measurement Activities" later in this chapter for more information).

Top: entries in the Klawock Cooperative Association's (Alaska) Trash Art contest held during its 2003 Earth Day Celebration. Bottom: Trashion Show winners from the Klawock Cooperative Association's (Alaska) 2003 Earth Day Celebration.

- The Alabama-Coushatta Tribe of Texas had opened a transfer station and covered all disposal costs for its members as an incentive for proper disposal. But tribal members continued to use burn pits and other illegal disposal methods. Consequently, the tribe's Solid Waste Department conducted an aggressive door-to-door campaign explaining the dangers of illegal dumping and the benefits of using the transfer station. Transfer station use grew as awareness increased.
- The Fond du Lac Band of Chippewa in Minnesota organized a door-to-door mercury thermometer exchange for ninth and tenth graders to teach them about household hazardous waste disposal issues. The students went to private residences with non-mercury thermometers and exchanged them for mercury thermometers.

Outreach to Schools

Some tribal leaders focus outreach initiatives on schools, teaching children about solid waste, why it is an important issue, and how to safely and effectively manage waste. These campaigns are conducted with the hope that the children will teach their family what they learn in school, take personal responsibility for the waste they generate, and continue to manage waste properly as adults. Because children will ultimately be the decision-makers for the tribe, teaching personal responsibility for solid waste early on can only benefit your tribe in later years.

- The director of the White Mountain Apache Tribe's Solid Waste Department in Arizona visits area schools to deliver educational programs on waste management issues. Sixth graders learn how to conduct waste assessments, fourth and fifth graders play environmental education

games, and the youngest students use coloring books to familiarize themselves with basic waste management concepts.

- The St. Regis Mohawk Tribe Environment Division in New York sponsored a series of cartoons, Kwis and Tiio: Solid Waste Management on the 'Rez, to increase awareness of proper solid waste management practices and to illustrate how disposal practices impact the environment.
- The Red Lake Band of Chippewa Indians in Minnesota helped students at the tribe's high school produce an educational video on illegal dumping on the reservation. Not only did the students who made the video get to learn firsthand about illegal dumping, but the video served to educate others as well.
- The Fond du Lac Band's Natural Resources Division in Minnesota obtained a resolution from the Reservation Business Committee in support of its illegal dumping prevention program. The division brought the resolution to the tribe's Ojibwe High School and Fond du Lac Elementary School and asked the schools to participate in an Earth Day cleanup. School administrators and teachers worked with the students to clean up and adopt the road in front of the school.
- The Pawnee Nation in Oklahoma created the Pawnee Environmental Education Center to educate students in tribal and local non-tribal communities about waste management and other environmental issues.

Meetings and Community Events

Another way of getting your message out is through meetings and community events. You might decide to organize a special meeting to communicate your information or make a presentation as part of a regularly scheduled tribal meeting. Meetings enable you to talk directly with your target audience, offering the benefit of two-way interaction. Educators have a forum for communicating their messages and information, while also hearing their audience's issues and concerns.

You also can hold an event, such as a community cleanup, a household hazardous waste collection day, or a children's poster contest, where the winner is publicly recognized. Events can be fun, interesting, memorable, and effective in getting your message out. It might be useful to turn a 1-day activity into an annual or monthly event to promote your message.

- At community events, the Environmental Office of the Seminole Nation in Oklahoma sets up a booth to distribute educational materials. The director of the Environmental Office also discusses current waste management issues in a weekly tribal radio program.
- The Lac Courte Oreilles Conservation Department of the Lac Courte Oreilles Chippewa Tribe in Wisconsin delivers

Children learn about recycling at the Klawock Cooperative Association's (Alaska) Earth Day Celebration.

presentations at the regular Community Circle meetings in each of the tribe's 23 villages.

- The Delaware Nation of Oklahoma's "Adopt a Highway" program enlists interested tribal community groups and residents in removing trash from an adopted stretch of highway four times each year.

Workshops/Training

Workshops and training sessions are valuable ways to educate your audience about a new program, policy, or waste management option. These sessions can provide a hands-on learning experience for participants, as well as an opportunity to ask questions or try out new techniques.

- The Gila River Indian Community in south-central Arizona held a workshop to educate its target audience—tribal officials and representatives—about the illegal dumping provision of the tribe's Solid Waste Ordinance and how to enforce it. The workshop was attended by a councilman, the Police Chief and police officers, tribal rangers, a prosecutor from the Law Office, the Chief Judge and Assistant Judge, a livestock officer, and representatives from the Department of Transportation, Emergency Management, and Public Works. Through the workshop, tribal

Table 7. Comparing Tribal Outreach Methods

Method	Investment of Time/Labor	Monetary Cost	Effectiveness
Signage	Low. Develop message for sign and set up at sites.	Low-Medium. Dependent on the quality of the signs (temporary or permanent).	Low-Medium. Tribal members will have to read and respond to signs.
Inserts/Flyers/ Articles	Low. Develop message for flyer and distribute.	Low. Paper, printing/ photocopying, labor.	Low-Medium. Message must be compelling to tribal members so they read and remember it.
Door-to-Door Campaigns	Medium-High. Canvassers must dedicate afternoons/ evenings over a set period of time to promote message.	Low-Medium. If volunteers agree to canvass, costs will stay down.	Medium-High. Talk to residents one-on-one to address their concerns. But the size of the audience may be limited.
Outreach to Schools	Medium-High. Dependent on size of event(s), activities planned.	Medium-High. Dependent on size of event(s), activities planned, materials needed.	High. Potentially large audience; reaches children and their families; fun events can help residents find favor with your message.
Meetings and Community Events	Medium-High. Dependent on size of event(s), activities planned.	Medium-High. Dependent on size of event(s), activities planned, materials needed.	High. Potentially large/diverse audience; fun or memorable activities can draw residents to your message.
Workshops/ Training	Medium-High. Dependent on size of workshop, training activities planned.	Medium-High. Dependent on size of workshop, training activities planned, materials needed.	High. Provide specific training to audience, address their questions and concerns. Helpful when introducing new programs.

Implementing a Hazardous Waste Education Program

The Native Village of Barrow-Inupiat Traditional Government in Alaska is developing an environmental protection program to properly address the release, or threat of release, of hazardous waste into the environment that might jeopardize human health and natural resources. The environmental program has taken an active approach to ensure the Inupiat people have substantial involvement in the environmental policy decisions that impact the entire village—its people and resources.

Activities under the grant include:

- Signing a Tribal Environmental Agreement between the tribe and EPA.
- Developing ordinances and regulations at the municipal and tribal level.
- Developing and implementing a hazardous waste and toxic material informational program with the North Slope Borough School District to identify common household hazardous waste and other toxic materials; identify municipal toxic and hazardous waste to initiate proper handling, storage, and disposal; and disseminate the information through local radio and television networks.
- Working with the agencies responsible for proper closure of the Barrow Landfill (which contains hazardous waste).
- Working with the U.S. Department of Defense to address hazardous waste impacts in the North Slope Borough area.

law enforcement officials saw the benefits of partnering with the community's Department of Environmental Quality on cases involving businesses that were dumping waste illegally. At the close of the workshop, the participants had agreed to coordinate with the tribe's public information office to issue press releases about enforcement actions.

Instituting the Community Education Program

Education and outreach programs are not complete once materials have been distributed—educational programs are continual and constantly evolving to meet the needs of tribal members. Many solid waste management programs are long term and require sustained education and training. In addition, tribal members will likely have questions about new programs and policies that may not be completely addressed through your initial outreach. Many solid waste programs also need to go through an adjustment process before they run smoothly, and education will be needed to help guide tribal members through these changes.

For these reasons, once you have an outreach program in place, it is important to take steps to:

- Address comments and complaints
- Sustain and adjust your education program
- Carry out program measurement activities

Addressing Comments and Complaints

When developing your educational initiatives, it is important to anticipate questions that tribal members will have so that they can be addressed early on (e.g., hours of

operation at the transfer station, what materials are or are not accepted for recycling). But it is sometimes impossible to anticipate every question or complaint a member will have about a new program or policy.

You might need to develop additional educational materials after your initial outreach to address unanswered community concerns. You also might need to establish additional or ongoing avenues for communication. One strategy is to designate an educator— perhaps a volunteer— who has been involved in the waste management program to field questions and comments during program implementation and after the program starts. Tribal members will become more informed and better equipped to follow waste management rules and regulations when they have a resource to turn to with their questions. Ultimately, responding to public inquiries and continually refining your program in response to comments will make your waste management program stronger and more accepted by the community.

Adjusting and Maintaining Your Education Program

It is important to note that both your solid waste management program and your educational initiatives might go through adjustments as they are implemented. For example, you might find that procedures for sorting recyclables need to change to make the program more efficient, or that you need to revise your transfer station hours of operation to better serve the tribe. As changes like these are made to a program, additional communication with your tribe will be necessary.

You also might find that your educational initiatives need fine tuning. Sometimes messages do not resonate with the target audience and are not as successful as anticipated in achieving the desired response. Similarly, a particular outreach method, like a brochure, might turn out to be ineffective in reaching your audience. In these cases, you may have a clear sense how to respond to improve your program, or you might consider formal testing of your message or materials (e.g., by surveying your audience or holding focus groups) or informal testing (e.g., asking your friends, family, and colleagues for their reactions) to get a "reality check" before proceeding further.

Carrying Out Program Measurement Activities

Sometimes it is difficult to tell whether your education program is having its intended effect. To determine the effectiveness of community education efforts, you can carry out measurement activities. First, consider what would be helpful to measure. Things you might want to measure could include:

- Have incidents of illegal dumping gone down?
- Are more tribal members using the transfer station?
- How much trash, by weight and volume, are you collecting now?
- What do residents think and say about the tribe's education program?

By measuring the effects of the tribe's waste management program, you will be better able to decide whether you need to carry out more education efforts or change your education approach.

Measurement is important because it can help you get to the root of persistent problems. For example, if your measurement efforts show that illegal dumping public education efforts have not been effective, you might decide to ask residents why they keep dumping trash illegally. They might tell you something important, and you can adjust your waste management program accordingly to make sure it is effective. Even after the Fond du Lac Band of Chippewa in Minnesota

closed its open dumps and private waste haulers began to service the community, charging reasonable monthly fees for curbside pickup, many residents continued to dump their trash illegally in remote areas and near old open dump sites. One obstacle to program implementation was a lack of awareness among tribal members about the environmental and health effects of illegal dumping. Consequently, the tribe's Resource Management Division distributed illegal dumping information at an annual health fair and other local events and publicized the risks associated with illegal dumping in the tribal newspaper.

Sample Educational Program: Illegal Dumping

The remainder of this chapter makes use of the recommendations provided earlier to help you create a community education program focused on stopping illegal dumping. As discussed earlier in this guide, laws and codes that prohibit illegal dumping and penalize lawbreakers are an essential part of a tribe's strategy to stop illegal dumping. Public education is another critical component of any effort to stop illegal dumping.

Setting Goals

The first step is to establish the goals for your educational program. The ultimate goal of your education program might be to encourage people to change their behavior to reduce or eliminate illegal dumping. In order to reach this overarching goal, you might want your educational initiatives to accomplish the following:

- Communicate why illegal dumping is bad for tribal members' health and the environment, including wildlife.
- Inform tribal members what illegal dumping codes or regulations the tribe has established and the penalties for breaking the law.
- Explain alternative waste disposal options, such as a nearby transfer station and recycling center.

It is important to realize that behavioral change will not happen overnight. Patience and persistence is important on your part. In the past, dumping trash in the woods was a common practice in some areas. Today, those who continue to dump in the woods are unaware that many materials contain toxic or environmentally harmful components. Often, these illegal dumpers are unaware of the environmental and health implications of their actions. They might need to hear why illegal dumping is harmful more than once before they change their ways. It also is important to remember that some illegal dumpers might not be able to afford or have access to current waste disposal options. Therefore, your education program will need to communicate to tribal members what waste disposal alternatives are available.

Understanding Your Audience and Crafting Messages

One of the challenges in addressing illegal dumping is identifying your target audience. The first step is determining who is dumping illegally. Investigating existing illegal dump sites can help you find clues. For example, most illegal dump sites within the Gila River Indian Community in Arizona are located along the reservation border, indicating that most of the illegal dumpers probably come from outside the community. Armed with this information, the Gila River Department of Environmental Quality designed an outreach campaign that extends beyond the borders of the reservation.

The next step is to identify the unique characteristics of your illegal dumpers, and tailor outreach efforts accordingly. For example, because the counties surrounding the Gila

River Indian Community have a large population of Spanish speakers, the Gila River Department of Environmental Quality recognized the need for new "No Illegal Dumping" signs with an international symbol for "no dumping."

Knowing why individuals are dumping illegally also can help make your outreach campaign more effective. Again, illegal dump sites might contain clues. Dump sites that consist primarily of household trash might indicate that current waste disposal options are too costly or inconvenient. Dump sites located next to closed dumps or burn pits might indicate that habit is driving the problem. Informal conversations with community members also can expose the reasons behind illegal dumping.

After identifying who is responsible for illegal dumping, expand your audience to include people who can influence the behavior of the illegal dumpers. Educate people who can pass on information and maximize the message's impact. For example, if habit is driving illegal dumping, educate children and tribal leaders about the problem. When these groups explain the dangers of illegal dumping, the community tends to listen.

If you distribute your educational materials and find that some members still continue to dump their waste illegally, then you might want to try one-on-one visits with the uncooperative citizens. The Onondaga Nation used this approach with the few households that refused to recycle and continued to dump illegally. These one-on-one household visits were successful in convincing these hold-outs to use the nation's transfer station.

Outreach Methods

After identifying your audience and determining your message, consider a variety of outreach methods. For example, in addition to posting "No Dumping" signs, the Keweenaw Bay Indian Community in Michigan produced a pamphlet detailing the environmental problems associated with illegal dumping. The pamphlet also instructs community members to report illegal dumping and educates them about proper waste disposal methods. The community distributes the pamphlet at public events and includes it with hunting and fishing license applications.

Cleanup events can encourage tribal members to report illegal dumping incidents and assist with future cleanup efforts. The White Mountain Apache Environmental Planning Office in Arizona used the "Adopt a Highway" program to catalyze community interest in its illegal dumping prevention program. The Solid Waste Department contacted residents and tribal businesses to locate volunteers to collect garbage, and the tribal Environmental Planning Office provided trash bags. At a day-long event, community members picked up trash discarded along many of the reservation's highways.

Measuring Success

Measuring the success of your outreach and educational program can be difficult but extremely useful as an assessment and planning tool. Measuring the number of tribal members who received your materials or message is fairly simple. You can determine the number of tribal members who attended workshops or community events or the number of households contacts via door-to-door campaigns, as well as determine how many educational brochures, flyers, and other materials you distributed.

Measurement also can help you identify the most effective outreach and education methods to help you plan future initiatives. The Alabama-Coushatta Tribe in Texas, for example, determined that it reached 60 percent of the households on the reservation through its door-to-door illegal dumping education campaign. Prior outreach efforts, such as presentations at public meetings,

were measured to have lower effectiveness due to poor turnout at these meetings.

Measuring the success of your outreach and educational program in changing tribal members' thinking or behavior can be more difficult, but several tribes have done so successfully. The Alabama-Coushatta Tribe measures the success of its outreach efforts by tracking the increase in the number of tribal residents using the tribe's transfer station after the door-to-door campaign. The Pawnee Nation in Oklahoma measured its outreach success by tracking the number of phone calls the Pawnee Environmental Education Center received after it opened. The number of calls to the tribal Department of Environmental Conservation and Safety reporting illegal dumping activities shot up after the center opened. The tribe attributed this to the increased awareness created by the tribe's outreach materials, not an increase in actual incidents.

Chapter Highlights

- Clearly identify your target audience, goals, and message.
- Select the outreach method(s) that most effectively delivers your message to your intended audience.
- Tailor your message to each audience by speaking in terms and the level of complexity that they will understand.
- Use your language and culture to help tribal members understand and accept your message.
- Work with the children in your tribe or village through the schools and youth groups, clubs, or organizations.
- Be responsive to community feedback and continually modify your methods and message to address community concerns and changing program goals.

Resources

EPA's *A Collection of Solid Waste Resources* (EPA530-C-01-002) contains publications on hazardous and non-hazardous waste topics. The CD is available from the National Service Center for Environmental Publications at 800 490-9189 or on the Web at <www.epa.gov/epaoswer/osw/cdoswpub.htm>.

EPA's *Let's Reduce and Recycle: Curriculum for Solid Waste Awareness* (EPA530-SW-90-005) educates young people about the problems associated with solid waste. Available on the "A Collection of Solid Waste Resources" CD.

What a Waste! A Teacher's Resource for Integrating the Solid Waste Crisis into the Classroom is targeted to elementary school students in grades 3-6 and adaptable for other grades. Available through the Southwest Connecticut Regional Recycling Committee at 800 455-9571.

A-way with Waste, available on the Web at <www.ecy.wa.gov/programs/air/aawwaste/awww.exe>, presents integrated waste management concepts affecting land, air, and water to promote awareness, attitudes, and actions to solve waste management problems at home, in school and in the community.

Pollution Prevention and Cultural Preservation in Native American Communities: An Educational Tool Kit for Tribal Colleges, produced by Montana State University Extension Service under a grant from EPA. It includes a student handbook, an educational guide, transparencies, worksheets, a test, and evaluations. For more information, contact Montana Pollution Prevention Program, Phone: 888 687- 6872, or 406 994-3451, or on the Web at <www.montana.edu/wwwated/>.

Environmental Protection Native American Lands: A Cultural Approach to Integrated Environmental Studies. Grades 1-12, Second Edition, a 52-lesson curriculum for grades 1

through 12 produced by the Center for Indian Community Development at Humboldt State University, under a grant from EPA. For more information, contact the Center for Indian Community Development, Humboldt State University, Phone: 707 826-3711, or on the Web at <sorrel.humboldt.edu/~nasp/>.

Examples of existing community education materials are available at EPA's "Waste Management in Indian Country" Web site at <www.epa.gov/tribalmsw>. Case studies describe community education efforts carried out by tribes, some of which are featured in this chapter. The Web site also has tribal-focused curricula for students at <www.epa.gov/epaoswer/non-hw/tribal/educout.htm>.

The St. Regis Mohawk Tribe Environment Division in New York developed a series of cartoons called *Kwis and Tiio: Solid Waste Management on the 'Rez*, available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/cartoon.pdf>.

Developing and Implementing Integrated Solid Waste Management Systems for Tribal Nations: A Training Course Prepared by the Tribal Association for Solid Waste and Emergency Response (TASWER) and the Solid Waste Association of North America (SWANA), Spring 2003. Contact TASWER <www.taswer.org> or SWANA <www.swana.org> for more information.

Chapter 7. Funding Your Solid Waste Management Program

For many Native American tribes and Alaskan Native villages, securing program funding is the most difficult solid waste management challenge they face. Every step in developing, implementing, and maintaining a solid waste management program requires funding. Most tribes, unfortunately, do not have the economic base to fully support these programs. This chapter will address the major costs associated with solid waste management, funding sources and opportunities, and ways to build strong relationships to acquire needed funds. The Resources section at the end of this chapter provides ordering information for several funding-related resources available to tribes and Alaskan Native villages. This section also provides brief descriptions of some of the primary federal grant programs for which tribes and Alaskan Native villages are eligible (including contact information).

Major Program Costs

The major costs associated with managing solid waste include:

- Program planning
- Facility design and construction
- Equipment purchase
- Cleanup
- Operation and maintenance
- Personnel training and administration
- Landfill closure and post-closure care

Program Planning

Your tribe needs funding to perform waste audits to identify waste types and volumes, develop integrated solid waste management plans to coordinate and guide your program, and complete feasibility studies and cost assessments for different waste management options.

Facility Design and Construction

Solid waste management facilities can include recycling centers, convenience centers, transfer stations, and landfills. Tribes need funds to hire engineers and architects to design the facility, as well as for new road construction, improvements, and repairs; utility installation (i.e., water, electricity, natural gas); and other construction costs.

Equipment

Solid waste management programs and facilities require various types of equipment, such

Front-end loader moving waste at the Eastern Band of Cherokee Indians' transfer station.

as collection vehicles, roll-off bins, waste compactors, and front-end loaders or bulldozers. Some programs also pay for the individual trash cans and recycling bins that are distributed to residents.

Operation and Maintenance

Once your program is in place or your facility begins operations, funds are needed to pay for staff salaries or wages; operation, maintenance, and repair of equipment and facilities; community education and outreach initiatives; and enforcement of codes and ordinances.

HAZWOPER certified workers clean up hazardous waste in Kokhanok Village (Alaska).

Personnel Training and Administration

Collection vehicle drivers and facility staff need technical training to operate and maintain equipment. Enforcement officials will need training on proper implementation of tribal codes and ordinances. Environmental staff might require legal, environmental health, technical, communication and education, grant writing, or financial training.

Cleanup

Open dump cleanups require significant amounts of funds to plan and complete. Costs include the purchase or rental of roll-off bins or other waste containers, hauling fees, tipping fees at the transfer station or landfill, and labor costs.

Sources of Funding

There are two primary sources of solid waste funding—**internal** and **external**. Most tribes have found that they require a combination of several internal and external funding mechanisms to fully support their solid waste programs.

Potential internal funding sources include monies allocated from the tribal general fund, solid waste service user fees, revenue generated from the sales of recyclable materials, and tipping fees from accepting waste from neighboring communities and businesses at your transfer station or landfill.

External funds typically are grants and loans from federal agencies or, less frequently, private foundations or organizations. Many tribes have found that federal grants and loans are necessary to construct solid waste management facilities such as transfer stations or landfills because of the high capital cost.

There are a few exceptions, however, such as the Onondaga Nation in New York that paid for the construction of its transfer station completely on its own. It is important to note that very few federal grants will fund solid waste facility operation and maintenance costs. Tribes and Alaskan Native villages will need to fund facility operation and maintenance internally or through other means.

Internal Sources of Funding

Tribes can access the following internal sources for funding:

- Tribal general fund
- User fees
- Sale of recyclables
- Tipping fees from neighboring communities and businesses

Tribal General Fund

Tribes can fund a portion of their solid waste management program with money from the tribal general fund. On many reservations, however, general fund monies help finance programs that are considered a higher priority than solid waste, such as drinking and waste water management and schools.

Some tribes use some of the revenue generated from tribal businesses, such as casinos or manufacturing industries, to fund solid waste management, either through the general fund or specified set-asides. Use of the revenue from these operations varies from tribe to tribe. Another approach to generating revenue is to levy fees on the sale of products such as cigarettes, gas, or alcohol. The St. Regis Mohawk Tribe in New York, for example, has added fees to cigarette and gas sales. These fees go into the tribal general fund and finance the tribal government, including part of its solid waste management program.

User Fees

User fees for solid waste services are a common source of funding for many tribes. These fees include transfer station or landfill tipping fees and waste collection service fees. Many tribes use a flat user fee, while others have instituted Pay-As-You-Throw (PAYT) programs, which charge per bag or pound of waste disposed. The St. Regis Mohawk Tribe, for example, operates a PAYT program. Under this program, residents using the tribe's door-to-door waste collection service purchase special blue trash bags from the tribe. The tribe's collection truck attendants pick up these bags only. Residents that do not use the door-to-door collection service can bring their waste directly to the tribe's transfer station, where they are charged a per-pound disposal fee.

The Confederated Tribes of the Umatilla in northeast Oregon employ a similar program. The tribes offer a curbside collection service that costs $22.70 per month. Customers can fill two 32-gallon garbage cans, which collection trucks pick up once a week. The tribes subsidize collection costs for senior citizens and disabled people—these customers only pay $7 per month. As an alternative to curbside collection, residents can bring trash directly to the transfer station, where they pay for disposal services on a per-pound basis. These fees help fund the collection service and transfer station operation. Additionally, 7 percent of the collected fees is set aside for maintenance and repair of the transfer station.

In northeast Montana, the Fort Peck Reservation (Assiniboine and Sioux Tribes) Operations and Maintenance Department charges residents $14 a month for curbside waste collection. This monthly fee is included on residents' utility bills. The fee only partially covers collection service operating costs, so the tribes are examining other ways to make the service self-sustaining. The tribes also maintain five roll-off sites as an alternative to

the curbside collection service. To use these sites, tribal members must purchase a permit. Residential permits are $15 a month, while businesses and contractors pay $300 a month. To provide an incentive for residents to reduce the amount of waste they produce, the tribes are considering replacing the monthly permits with a $15 per visit tipping fee.

Sale of Recyclables

Another potential source of funding for your tribe's solid waste program is revenue from the sale of certain recyclable materials. The Eastern Band of Cherokee Indians in North Carolina, for example, discovered through a waste audit that the tribe generates large quantities of cardboard. Fortunately, a steady demand for recycled cardboard exists in the area, which allows the tribe to make a small profit from its sales. The St. Regis Mohawk Reservation in New York also sells recyclables to help fund its collection program and transfer station operations. The ability to sell recyclables will depend on local demand and markets, as well as your tribe's ability to generate a large enough volume of contaminant-free, high-value materials to make selling profitable. Remotely located reservations or those with small populations might not find it profitable to sell recyclables. For more information on tribal recycling programs, refer to Chapter 5.

Tribes and villages with composting operations have another potential opportunity for generating revenue—the sale of finished compost. The Eastern Band of Cherokee in North Carolina operates a successful composting operation at its transfer station. In fact, there is such a high demand from nurseries, landscapers, and individual homeowners for the finished compost that the tribe had to create a waiting list. Charging a fee for the finished compost product from the beginning is important, as it conveys to the tribal members and customers that the compost is a valuable material.

Tipping Fees from Neighboring Communities and Businesses

Allowing surrounding communities and businesses to use your transfer station is another potential source of revenue available to tribes. In order to accept off-reservation waste, your transfer station or landfill must have enough capacity to accommodate the extra waste. The Eastern Band of Cherokee Indians, for example, accepts waste at its transfer station from neighboring Swayne County and some private businesses in Jackson County, North Carolina. Since the Cherokee designed its facility to accommodate its waste for the next 10 years, the facility currently has the excess capacity to accept Swayne County's waste.

To be profitable, you will need to ensure that incoming revenue from tipping fees cover increased operation and maintenance, waste hauling, and disposal costs. You will need to research tipping fees in your area to make sure you can establish competitive rates that are still profitable. Calvin Murphy with the Cherokee Tribal Utilities cautions tribes against building a transfer station for profit. "You might not ever see a return on your investment," he said. "When sizing our transfer station, we concentrated on our own waste, not Swayne County's waste."

The Confederated Tribes of Umatilla Indians in Oregon is considering accepting waste from neighboring counties at its transfer station. The transfer station has a design capacity of 200 tons per day. To break even, the transfer station must take in 60,000 tons per year (164 tons per day). Currently, the transfer station is taking in less than 30 tons per day. To offset operation and maintenance costs and move the facility into the black, the tribe is looking to expand its customer base beyond tribal residents and businesses to include customers in neighboring Pendleton City.

External Sources of Funding

Tribes can apply for grant funding from the following outside sources:

- Federal grants and loans
- Private and nonprofit foundations

Most grant funds and loans are used as start-up funds for recycling and other waste management programs, not to sustain long-term programs.

Federal Grants and Loans

Some federal agencies, including EPA, IHS, U.S. Department of Health and Human Services' Administration for Native Americans, USDA's Rural Development, HUD, and BIA, offer financial assistance to tribes and Native villages for solid and hazardous waste management projects. Most of the grants and loans available provide monies for planning, outreach and education, construction, or equipment purchase. As noted earlier, few federal grant programs, however, allow funds to be used for program or facility operation and maintenance.

TASWER also can help tribes and Alaskan Native villages secure funding by directing them to the appropriate representative for each source of funding. TASWER's Web site lists some sources of funding available to tribes and Alaskan Native villages.

> "The challenge is finding a grant that fits your needs. Creativity is the key to success. Grant writers need to find ways to make grants fit tribal needs. At the same time, tribal leaders must realize that some needs can not be met through grants."
>
> ~Deb Madison,
> Environmental Program Manager,
> Fort Peck Reservation Environmental Protection Office

Private and Nonprofit Foundations

A number of private and nonprofit foundations and organizations run environmental grant programs. The Confederated Tribes of the Umatilla in Oregon, for example, received a $25,000 grant from the JELD-WEN Foundation to construct its transfer station and recycling program. EPA's *Grant Resources for Solid Waste Activities in Indian Country* provides an extensive list of private sources of funding for tribes and Alaskan Native villages.

Some tribes can fund their solid waste management program by piecing together grant

Wading Through the Paperwork

Securing federal grants and loans is a great way to pay for facility construction, but it does not come without difficulties or challenges. Frequently, the biggest roadblock to obtaining federal grants is the application. Most agency applications are very long and complicated. USDA's Rural Development grant/loan application, for example, provides a checklist of required items to help applicants, which is six pages long and double-sided. Some applications require specific information or data that many tribes do not have on hand, such as HUD's Indian Community Development Block Grant (ICDBG) application, which requires specific census data.

Even after you submit the application, the work is not necessarily complete. Laura Weber, director of solid waste management for the St. Regis Mohawk Reservation, relates how her tribe applied for and received HUD ICDBG, IHS, and USDA grants to pay for the construction of its transfer station. Even though the tribe received the ICDBG and IHS grants first, USDA served as the lead agency and required the tribe to follow the USDA grant management and paperwork guidelines for all three grants. As part of this, the tribe had to go through a complex series of procedures to finalize the design, perform site assessment testing, and secure a bonded contractor. At each step of the way, the tribe had to get the lead agency to approve everything in writing.

monies from a variety of sources. To manage its waste, the Confederated Tribes of the Umatilla built a transfer station adjacent to the reservation. It took nearly 10 years of careful planning and more than $1.3 million to design and build the transfer station. The tribes contributed $200,000 of their own funds to this project. The remaining funds came from several federal grants, including a $350,000 Indian Community Development Block Grant from HUD, a $196,000 grant from the Administration for Native Americans, and a $150,000 Sanitation Deficiency System grant from IHS. The tribes also received a $564,000 loan from USDA and a $25,000 grant from the private JELD-WEN Foundation.

Another possible strategy for increasing your tribe or village's chance of receiving grants is to break big projects into discreet portions and seek funding for the individual parts. For example, obtaining $75,000 from an agency for a portion of your program, such as purchasing a collection truck, might be easier than obtaining $600,000 for the entire program all at once.

To pay for the closure of its 12 identified open dumps and construct a balefill landfill and baler building, the Oglala Sioux Tribe (OST) of the Pine Ridge Reservation in South Dakota secured more than $3.7 million dollars from federal agencies. The OST Tribal Council also contributed an additional $100,000 to the project. This money was needed to comply with a 1990 U.S. District Court decision that ordered IHS, BIA, and the Oglala Sioux Tribe to close open dumps on the Pine Ridge Indian Reservation. These grants and loans covered solid waste management planning, open dump cleanup and closure, construction of the balefill and baler building, and the purchase of related equipment. Grants included:

- $591,000 from EPA's Office of Solid Waste and Emergency Response
- $600,000 from BIA's Office of Trust Responsibility
- $724,000 from IHS's Sanitation Deficiency System
- $1,200,000 from USDA's Rural Development (of which 75 percent was a grant and 25 percent a loan)
- $337,268 from the Interagency Solid Waste Work Group
- $250,000 from the Oglala Sioux Housing Authority

Finding Out About Funding Opportunities

There are many ways to learn about what funding opportunities are available to tribes and Alaskan Native villages. A few of the more common methods include:

- Announcements from federal agencies
- Internet searches
- Communication with other tribes
- Communication with regional agency representatives

Announcements from Federal Agencies

Most federal agencies announce grant and loan availability in the *Federal Register* and provide information on their Web sites. Some agencies send out announcements and solicitations for their grant programs. The Interagency Work Group, for example, mails an annual announcement and solicitation for its open dump cleanup grants.

Internet Searches

Many tribes learn about grant programs by conducting simple Internet searches. USDA's

Leveraging Non-Monetary Assets

In addition to seeking money for program development and implementation, many tribes have found that different forms of non-monetary assistance can be just as useful. Partnering with neighboring tribes and villages, local governments, or businesses and sharing resources such as information, equipment, labor, materials, services, or facilities can provide mutual benefits and help strengthen your solid waste management program. Cooperative arrangements with local governments can also help in addressing the impacts of activities outside of the reservation on tribal lands. Here are just a few examples of how tribes and Alaskan Native villages have leveraged non-monetary resources to make their programs a success.

- The Wyandotte Nation in Oklahoma, partnered with neighboring Ottawa County to clean up and secure an open dump site. The 4-acre open dump site was located on the Wyandotte Reservation, adjacent to a county road cutting through the tribe's land. The tribe cleaned the site and the county provided equipment and labor to dig a ditch alongside the road to prevent future illegal dumping at the site.
- When the Assiniboine and Sioux Nations of the Fort Peck Reservation in Montana were investigating options for expanding their waste collection system, they turned to neighboring Valley County for some free advice. Valley County had been successfully operating a waste collection system using several roll-off container drop-off sites that the tribes wanted to learn more about. Valley County willingly shared its knowledge and experience, and provided the tribes with enough information to help develop its own roll-off site system. The tribes also negotiated an agreement with the county to ship some of their waste to the Valley County Landfill.
- The Alaskan Native village of Galena, also known as Louden Village, secured an agreement with an area barge company to back haul junk cars and other wastes from area villages for free. Carole Holley, the environmental program director for the Louden Tribal Village Council, first contacted Captain Moore of the Yutana Barge Lines. The Yutana Barge Lines was involved in a lawsuit in 1996. As part of the settlement, the company agreed that its barges would provide free back hauling services to several villages. Captain Moore not only agreed to back haul the cars to his home port of Nenana, but also suggested that Ms. Holley call the Alaskan Railroad Corporation and ask about hauling the cars the remaining distance to Anchorage for final recovery and disposal. When Ms. Holley mentioned that Yutana Barge Lines was back hauling the cars for free, the railroad company volunteered its services for free as well. In the first year, more than 60 cars were removed from the villages. The car removal has become an annual event in the villages, and Captain Moore has agreed to continue providing free back hauling service.

Rural Development grants, for example, are accessible through Web sites that include descriptions of the grant programs, including applications, instructions for applying, and contact information for state and regional representatives.

One online database tribes and Alaskan Native villages can use to find out about grant opportunities is the Catalogue of Federal Domestic Assistance (CFDA), at <www.cfda.gov>. It is a database of all federal assistance programs—including grant and loan programs—available to state, local, and tribal governments. After identifying potential sources of funding through CDFA, tribes should then go directly to the funding agencies for application information. Tribes also can search other federal agency Web sites for solid waste grants and loan information.

Communication with Other Tribes

Another way to learn about available grants is by talking with other tribes, either through informal conversations or networking at conferences and meetings. Conversations with neighboring tribes are a primary source of grant information for some tribes. Sharing information and experiences can be mutually beneficial. Some tribes even exchange successful grant applications to help improve future applications.

Communication with Regional Agency Representatives

In addition to speaking with other tribes or villages, you can speak directly with your regional agency representatives from EPA, IHS, BIA, USDA, and HUD. Some tribal solid waste managers have noted that this is a crucial part of securing funds for your tribe or village and recommend building relationships with representatives from the various federal agencies.

Building Strong Relationships

One of the most important parts of the entire application process, and a major key to success in receiving funding, is having a good relationship with your agency representative. Agency representatives can help you complete your grant applications and make sure all of the required pieces are included. When working on your grant application, speak with your agency representative to make sure you have everything you need. Go

Making Solid Waste a Priority and Building Relationships: A Winning Combination

The Fort Peck Reservation in northeast Montana is home to the Assiniboine and Sioux Nations. In the early 1990s, the tribes realized that current waste disposal options were not meeting the reservation's needs. The tribes adopted a roll-off bin system, which a neighboring county had successfully used for several years. To build the first two roll-off sites, tribes applied for and received a HUD Indian Community Development Block Grant.

To build the three remaining sites, the tribes applied for and received funding from IHS's Sanitation Deficiency System (SDS). To get SDS funding, the tribes' Operation and Maintenance (O&M) staff had to convince the tribal council to designate solid waste as the top priority on their annual sanitation deficiency list. O&M staff explained that open dump sites are illegal and a liability for the tribe. Knowing that pictures can be an effective persuasion tool, O&M staff showed the council contrasting pictures of open dumps and roll-off sites.

O&M staff also spoke to the tribal council about their integrated solid waste management plan and explained how the roll-off sites were a key component of the plan. The staff showed the council how the roll-off sites fit into the big picture and demonstrated that the roll-off sites are part of a larger plan that includes recycling and waste prevention. IHS also helped convince the tribal council to make solid waste a priority. An IHS engineer explained to the tribal council that there was a good chance that the roll-off sites would get funded if the tribes placed solid waste at the top of their priority list.

Developing a relationship with their IHS engineers was important for the tribes. The first IHS engineer that tribal planners worked with was a friend, so the tribes felt comfortable communicating their needs to IHS through this engineer. This individual paved the way for future relationships, and as a consequence the tribes have had good relationships with successive IHS engineers.

to the agency office if you are having difficulty completing the application.

Laura Weber, director of solid waste management for the St. Regis Mohawk Reservation, also advocates relationship-building, based on her tribe's experience. Her tribe first learned about IHS Sanitation Deficiency System (SDS) funding for solid waste from an IHS engineer who worked on water projects with the tribe. In addition to informing the tribe about SDS funding, the engineer also pointed it toward HUD's Indian Community Development Block Grant (ICDBG) program.

St. Regis Mohawk's experiences further demonstrate the importance of building and maintaining relationships with your regional agency representatives. A short time after receiving one USDA grant, the tribe's USDA representative called to say it had grant funding available and that the St. Regis Mohawk Tribe should apply for it. The tribe worked closely with the regional project officer during the application process, and the tribe received the second grant for construction of its transfer station.

If your regional representatives are not responsive, invite them to your reservation to build a relationship with them. The St. Regis Mohawk Tribe conducts a weekend cultural sensitivity workshop to help individuals from outside the community understand the tribal perspective. Partnering with a regional representative can benefit both your tribe and the federal agency.

If your grant application is unsuccessful, call your agency representative and ask why, as well as how you can improve your chances in the future. The first time the St. Regis Mohawk Tribe applied for a HUD ICDBG, it was not selected. The tribe contacted the HUD office to find out why and ask for ways to improve the application. The HUD representative sent back the application with an evaluation form. The tribe used HUD's comments to revise the application. When the tribe resubmitted the application, HUD awarded the tribe an ICDBG.

> "Educate [agency representatives] about your tribe's history, culture, and current situation. Explain your tribe's accomplishments, especially the ones dealing with solid waste. If they understand your tribe, who you are, and what you have accomplished, they are more likely to support you in future endeavors."
>
> ~Kim Clausen-Jensen,
> Oglala Sioux Environmental Protection Program

In addition to building a relationship with your agency representatives, many tribes emphasized the importance of building a positive reputation for your tribe or village. Building trust is a major part of this process. If you can demonstrate to the agency representative that your tribe or village has been successful in the past and is responsible and accountable, your representative is more likely to support you in securing future technical assistance and funding. One way to build this trust is to make sure you submit all required reports and meet all agency requirements when you do receive a grant. This attention to detail is especially crucial with pilot projects. If agencies can not document the success of a pilot project, it is unlikely to be continued. Submitting the required reports helps the agency justify the project to internal federal reviewers and can help ensure that the project receives continued funding.

Chapter Highlights

- Use as many internal and external funding sources as possible to fund your solid waste program. Do not rely on a single source.
- Ensure that you have sufficient resources to continue funding program or facility

operation and maintenance once grant monies are gone.

- Leverage non-monetary assets to develop and sustain your program.
- Build and maintain strong relationships with agency representatives, neighboring governments, and other tribes and villages.
- Develop a reputation of being reliable and trustworthy. Live up to your end of the bargain!
- Be persistent and ask for help from agency representatives and other tribes and villages.

Resources

The following resources can help you find out where and how to apply for solid waste management grants:

- *Grant Resources for Solid Waste Activities in Indian Country* (EPA530-R-98-014), available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/tribfund.pdf> or by contacting the RCRA Call Center at 800 424-9346.
- *Solid Waste Funding: A Guide to Federal Assistance* (EPA530-F-97-027), available on the Web at <www.epa.gov/epaoswer/non-hw/grants/grants.pdf> or by contacting the RCRA Call Center at 800 424-9346.
- *Preparing Successful Grant Proposals tip sheet* (EPA530-F-97-020), available on the Web at <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/grant.pdf> or by contacting the RCRA Call Center at 800 424-9346.
- EPA's Grant Writing Tutorial, available on the Web at <www.epa.gov/grtlakes/seahome/grants.html>.
- The Catalog of Federal Domestic Assistance, on available the Web at <www.cfda.gov>.
- Tribal Association of Solid Waste and Emergency Response (TASWER). Phone: 202 331-8084, Fax: 202 331-8068, Email:<contact@taswer.org>, on the Web at <www.taswer.org>. Contact TASWER for more information and assistance in connecting with the appropriate agency representative.

Federal Sources of Grant Funding

U.S. Environmental Protection Agency (EPA) offers a number of grants for solid and hazardous waste projects. Each grant program provides funding for specific solid and hazardous waste management activities. To increase your chances of receiving a grant, match your program needs to the appropriate EPA program. Listed below are several grants available to tribes and Alaskan Native villages from EPA. Visit the Web sites provided with each description to learn more about each grant program and to get application information.

Office of Solid Waste Hazardous Waste Management Grants

These grants provide financial assistance to tribes and intertribal consortia for developing and implementing programs to manage hazardous waste. Programs can include developing and implementing hazardous waste codes, regulations, and ordinances, along with enforcement policies and procedures; identifying and assessing hazardous waste generation and management; developing and implementing integrated hazardous waste management plans; developing and implementing used oil collection and recycling programs; developing outreach and education materials; and creating hazardous waste management training. For more infor-

mation, contact your regional tribal hazardous waste management representative or call Denise Roy at 703 308-8458.

InterAgency Open Dump Cleanup Project Grants

The goal of the Tribal Solid Waste Interagency Workgroup Cleanup Project is to help tribes close or upgrade open dump sites. Specific goals include assisting tribes with: 1) completing and implementing comprehensive, integrated waste management plans, 2) developing realistic solid waste management alternatives, 3) closing or upgrading existing open dumps, and 4) developing post-closure programs. Since 1999, federal agencies have committed $6.1 million to 31 tribes to clean up open dumps. EPA mails the Cleanup Project information and application package annually to every federally recognized tribe. It also is available from EPA's Tribal Municipal Solid Waste Funding Web page at <www.epa.gov/epaoswer/non-hw/tribal/finance.htm>. For more information, contact your regional solid waste Indian coordinator. To find your regional coordinator's contact information, visit <www.epa.gov/epaoswer/non-hw/tribal/about.htm>.

Alaska Solid Waste Management Demonstration Grant's Project

This collaborative project between the Alaska Native Health Board and EPA funds village-based solid waste projects. Grant awards range from $2,000 to $10,000. Eligible projects can range from developing a solid waste management plan to properly closing a community dump site. For further information, contact the Alaska Native Health Board, Phone: 907 562-6006, Fax: 907 563-2001, or E-mail: <solidwaste@anhb.org>. EPA's Tribal Municipal Solid Waste Funding Web page <www.epa.gov/epaoswer/non-hw/tribal/finance.htm> provides more details.

American Indian Environmental Office (AIEO) General Assistance Program (GAP) Grants

The primary purpose of GAP grants is to support the development of a core tribal environmental protection program. Tribes can use GAP grant funds for planning, building solid waste infrastructure, enforcement, or outreach and education. For a description of the GAP grant program, including eligibility and application information, visit <www.epa.gov/indian/pdfs/gap2000.pdf>.

Brownfields Economic Redevelopment Initiative

This initiative helps states and communities, including tribes and Alaskan Native villages, clean up and redevelop brownfields. Brownfields sites are abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. EPA offers several grant and loan opportunities under this initiative for which tribes and Alaskan Native villages are eligible. For more information on this initiative, visit <www.epa.gov/brownfields/topics.htm>. For complete brownfields application information, visit <www.epa.gov/brownfields/applicat.htm>.

Indian Health Service (IHS) provides health services to American Indians and Alaskan Natives. IHS inventories sanitation deficiencies in Indian and Alaskan Native communities—tribes or villages report sanitation deficiencies as proposed improvement projects each year. To significantly increase their chance of receiving IHS funding, tribes need to place their solid waste project at the top of their annual sanitation deficiency list. Tribes can use IHS Sanitation Deficiency System (SDS) funds to construct water, sewerage, and solid waste disposal systems and facilities. For more information on SDS funding, contact your regional IHS representative. Regional contact information is avail-

able through IHS' Area Offices and Facilities Web site, <www.ihs.gov/FacilitiesServices/AreaOffices/AreaOffices_index.asp>.

U.S. Department of Health and Human Services' Administration for Native Americans (ANA) awards funds to Native American tribes and Alaskan Native villages through environmental regulatory enhancement project grants. ANA publishes an announcement of funds available in the Federal Register. This announcement describes the grant's primary areas of focus, review criteria, and application method. For more information, visit <www.acf.dhhs.gov/programs/ana/notice.htm>.

U.S. Department of Agriculture Rural Development's Rural Utilities Service (RUS) Water and Environmental Programs provide loans, grants, and loan guarantees for drinking water, sanitary sewer, solid waste, and storm drainage facilities to tribes. Water and Waste Grants and Loans set aside funding for Native American tribes that can fund up to 75 percent of the cost of a project. What is not funded by the grant can be offered as a low-interest government loan. Tribes can use these grants and loans to construct, enlarge, extend, or improve rural water, sanitary sewage, solid waste disposal, and storm water disposal facilities. Visit the RUS Web page at <www.usda.gov/rus/index2/rusregs.htm> for details and application information.

U.S. Department of Housing and Urban Development (HUD) Community Development Block Grants (CDBG) program aims to develop viable communities by ensuring decent, affordable housing, a suitable living environment, and economic opportunities for low- to middle-income communities. Several tribes have used these grants to fund solid waste management projects or programs that improve housing developments. Within the CDBG program, HUD specifically sets aside funds for Native American tribes for Indian Community Development Block Grants (ICDBG). For eligibility and application information, visit HUD's CDBG Web page at <www.hud.gov/offices/cpd/communitydevelopment/programs/cdbg.cfm>.

Acronyms List

ANA — Administration for Native Americans

ANHB — Alaska Native Health Board

BIA — Bureau of Indian Affairs

C&D — Construction and demolition

CCA — Clean Air Act

CERCLA — Comprehensive Environmental Response, Compensation, and Liability Act

CWA — Clean Water Act

EPA — Environmental Protection Agency

HUD — Housing and Urban Development

ICDBG — Indian Community Development Block Grant

HHW — Household hazardous waste

IHS — Indian Health Service

ISWM — Integrated solid waste management

MSW — Municipal solid waste

PAYT — Pay-as-you-throw

RCRA — Resource Recovery and Conservation Act

RUS — Rural Utility Service

SDS — Sanitation Deficiency System

SDWA — Safe Drinking Water Act

SWANA — Solid Waste Association of North America

TASWER — Tribal Association of Solid Waste and Emergency Response

TSCA — Toxic Substances Control Act

USDA — United States Department of Agriculture

Appendix A: Glossary

Balefill: A landfill that only accepts waste that has been baled.

Baler: A machine used to compress recyclables or waste into bundles to reduce their volume. Balers are often used on recyclables such as newspaper, plastics, and corrugated cardboard.

Burn Barrel: A container (e.g., a 55-gallon drum) used for open burning of waste.

Buy-Back Center: A facility to which individuals bring recyclables in exchange for payment.

Clean Air Act (CCA): The Clean Air Act is a federal law that requires EPA to set national health-based air quality standards to protect people and the environment against common pollutants, including ozone (smog), carbon monoxide, sulfur dioxide, nitrogen dioxide, lead, and particulate soot. State governments must devise cleanup plans to meet the heath standards by a specific date. In addition, EPA sets national standards for major new sources of pollution including automobiles, trucks, and electric power plants. EPA also is charged with developing controls for major sources of such toxic pollutants as benzene.

Clean Water Act (CWA): The Clean Water Act is a federal law that established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The Act also continued requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution.

Closure: The termination of the active life of a waste management unit by either: 1) installation of a final cover, or 2) removal of all waste and contaminated soils and containment devices.

Composting: The controlled decomposition of organic materials, such as leaves, grass, and food scraps, by microorganisms. The result of this decomposition

process is compost, a crumbly, earthy-smelling, soil-like material.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as Superfund, was enacted by Congress in 1980. This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over 5 years, $1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified.

Construction and Demolition (C&D) Debris: Materials resulting from the construction, remodeling, repair, or demolition of buildings, bridges, pavement, and other structures. Typically includes concrete, asphalt, wood, metals, drywall (gypsum wallboard, sheet rock, or plaster), and roofing materials. Some tribes and states also include land clearing debris such as stumps, rocks, and dirt in this category of waste.

Convenience Centers: Community waste and/or recyclables drop-off sites. They typically consist of one or more bins for waste and/or recyclables and are located at spots convenient for residents, such as near major roads or at shopping centers or community centers.

Curbside Collection: Programs in which waste or recyclable materials are collected at the curb, often from special containers, and then taken to various processing facilities.

Drop-off Collection: A method of collecting waste, recyclable, or compostable materials in which the materials are taken by individuals to collection sites, where they deposit the materials into designated containers.

End-Use Market: A company or other entity that purchases recycled materials for use as feedstock in manufacturing new products.

Generator: Any entity that produces solid waste. Generators are usually divided into the following types: residential—single or multi-family households; commercial—offices, retail and wholesale outlets; institutional—social, educational or charitable activities; and industrial—industrial processes or manufacturing operations.

Generation Rate: Amount of solid waste produced over a given period of time. For example, a community might produce 1,600 tons of waste per year. For a population of 2,000, that amounts to 4.4 pounds per person per day.

Household Hazardous Waste: The leftover content of consumer products used in and around the home that contain hazardous components, including certain paints, cleaners, stains and varnishes, car batteries, motor oil, and pesticides. Certain types of household hazardous waste have the potential to cause physical injury to sanitation workers, contaminate septic tanks or wastewater treatment systems if poured down drains or toilets, and present hazards to children and pets if left around the house. While households do not have to separate

household hazardous waste from trash under federal law, some states and localities have special disposal requirements for this waste.

Incinerator: A furnace for the routine burning of waste materials using controlled flame combustion.

Integrated Solid Waste Management: A solid waste management system composed of the following actions, steps, methods, processes, and facilities: planning, financing, regulation, operation, and management. It also includes: reduction of solid waste generation (source reduction), collection, transfer, materials recycling, composting, combustion (incineration or waste-to-energy), and disposal. EPA defines integrated solid waste management as a process for managing solid waste and materials diverted from solid waste through a combination of any of the following four methods of management: source reduction, recycling, combustion, and landfilling.

Medical Waste: All wastes from hospitals, clinics, or other health care facilities that contain or have come into contact with diseased tissues or infectious microorganisms. Can include human blood and blood products, pathological waste, discarded sharps (e.g., needles, lancets, scalpels, broken medical instruments), and contaminated animal waste. Also referred to as "red bag" waste because of the red biohazard bags in which it is discarded.

Open Burning: The uncontained burning of solid waste in a pit, pile, container, or open dump.

Open Dump: An uncovered site used for disposal of waste without environmental controls. Under RCRA, any site receiving solid waste that does not comply with Subtitle D municipal solid waste landfill standards.

Pay-As-You-Throw (PAYT) Program: A waste and recyclables collection program that provides a financial incentive to reduce, reuse, and recycle waste by charging residents for hauling and disposal costs based on the amount of garbage they throw away.

Post-Closure Care: The monitoring of a closed waste management unit to verify that unacceptable releases from the unit are not occurring.

Recycling: A series of activities that includes collecting recyclable materials that would otherwise be considered waste, sorting and processing recyclables into raw materials such as fibers, and manufacturing raw materials into new products.

Resource Conservation and Recovery Act (RCRA): This act authorizes EPA to control solid and hazardous waste from "cradle to grave." RCRA regulates hazardous waste generation, transportation, storage, treatment, and disposal. RCRA also sets forth a framework for the management of non-hazardous solid waste. Amendments to RCRA in 1986 also authorized EPA to address environmental problems arising from underground storage tanks (USTs) storing petroleum and other hazardous substances.

Reuse: Using a product more than once, either for the same purpose or for a different purpose. Reusing items by repairing them, donating them to charity and community groups, or selling them also reduces waste.

Roll-off Container: A large waste or recyclables container that fits onto a tractor trailer that can be dropped off and picked up hydraulically.

Safe Drinking Water Act (SDWA): The Safe Drinking Water Act is the main federal law that ensures the quality of Americans' drinking water. Under the Act, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers that implement those standards.

Solid Waste: Wastes from residential, commercial, and institutional sources, such as durable and nondurable goods, containers and packaging, food scraps, yard trimmings, inorganic wastes, and construction and demolition debris.

Source Reduction (or Waste Prevention): Refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce the amount or toxicity before these materials become municipal solid waste. Source reduction also refers to the reuse of products or materials.

Special Wastes: A non-regulatory term used by tribes to describe problem wastes typically generated by households that are not disposed in household garbage containers primarily due to their size or because of disposal restrictions. The most common special wastes include tires, furniture, bicycles, appliances and other white goods, and car batteries. Tires and lead-acid car batteries are examples of special wastes that might have disposal restrictions.

Toxic Substances Control Act (TSCA): This act, passed by Congress in 1976, requires the that all chemicals produced or imported into the United States be tested, regulated, and screened for toxic effects. TSCA requires that any chemical that reaches the consumer market be tested for possible toxic effects prior to commercial manufacture. Existing chemicals that pose health and environmental hazards are tracked and reported under TSCA. The management and disposal of asbestos and polychlorinated biphenyls (PCBs) are regulated under TSCA.

Transfer Station: A site or facility where waste materials are taken from smaller collection vehicles (or private vehicles) and placed in larger vehicles, including truck trailers, railroad cars, or barges for transport. Recycling and some waste processing also might take place at transfer stations.

Waste Reduction: Using source reduction, recycling, or composting to prevent or reduce waste generation.

Waste Stream: The total flow of solid waste from generators within the jurisdiction that must be recycled, reused, or disposed of.

WasteWise: WasteWise is a free, voluntary EPA partnership program through which tribes, communities, and organizations can work to eliminate waste, benefitting their bottom line and the environment. The WasteWise program can help partners design their own solid waste reduction programs tailored to their needs.

Yard Trimmings: Leaves, grass, clippings, prunings, and other natural organic matter discarded from yards or gardens. Yard trimmings also may include tree stumps and brush, but these materials are not normally handled at composting facilities.

Appendix B: Tribal Information Sources and Contacts

EPA Region 1 (CT, MA, ME, NH, RI, VT)

U.S. EPA Regional Tribal Coordinator

Municipal solid waste and hazardous waste:
Chuck Franks, 617 918-1554
JFK Federal Building, Boston, MA 02203-2211

Mohegan Tribe of Indians of Connecticut

Phone: 860 204-6112; Fax: 860 204-6129
Mailing Address: The Mohegan Tribe, P.O. Box 488, Uncasville, CT 06382

EPA Region 2 (NJ, NY, PR, VI)

EPA Regional Tribal Coordinator

Municipal solid waste and hazardous waste:
Lorraine Graves, 212 637-4099
290 Broadway, 26th Floor, New York, NY 10007-1866

St. Regis Mohawk Tribe of New York

Phone: 518 358-5937
Mailing Address: Environment Division, 412 State Route 37, Akwesasne, NY 13655

Onondaga Nation in New York

Phone: 315 492-4210
Mailing Address: Onondaga Nation, Box 319 B, Hemlock Road, via Nedrow, NY 13120

EPA Region 3 (DC, DE, MD, PA, VA, WV)

(No federally recognized tribes.)

EPA Region 4 (AL, FL, GA, KY, MS, NC, SC, TN).

EPA Regional Tribal Coordinators

Municipal solid waste:
Davy Simonson, 404 562-8457

Hazardous waste:
Patricia Herbert, 404 562-8449
Atlanta Federal Center, 61 Forsyth Street, SW., Atlanta, GA 30303-3104

Eastern Band of Cherokee Indians in North Carolina

Phone: 828 497-6977, or 828 497-3908

EPA Region 5 (IL, IN, MI, MN, OH, WI)

EPA Regional Tribal Coordinators

Municipal solid waste:
Dolly Tong, 312 886-1019

Hazardous waste:
Margaret Millard, 312 353-1440
77 West Jackson Boulevard, Chicago, IL 60604

Bois Forte Band of Chippewa in Minnesota

Phone: 218 757-3261
Mailing Address: Department of Natural Resources, Box 16, Nett Lake, MN 55772

Fond du Lac Band of Lake Superior Chippewa in Minnesota

Phone: 218 878-8006
Mailing Address: 1720 Big Lake Road, Cloquet, MN 55720

Grand Traverse Band of Ottawa & Chippewa Indians in Michigan

Phone: 231 271-3538
Mailing Address: 2605 NW Bayshore Drive, Suttons Bay, MI 49682

Hannahville Indian Community in Michigan

Phone: 906 466-2934
Mailing Address: N14911 Hannahville B1 Road, Wilson, MI 49896

Keweenaw Bay Indian Community in Michigan

Keweenaw Bay Tribal Center
Phone: 906 353-6623

Lac Courte Oreilles Chippewa Tribe in Wisconsin

Phone: 715 865-2329
Mailing Address: 13394 West Trepania Road, Building 1, Hayward, WI 54843

Lac du Flambeau Band of Lake Superior Chippewa Indians in Wisconsin

Phone: 715 588-3303, extension 255

Oneida Tribe of Indians of Wisconsin

Phone: 920 869-4374
Mailing Address: P.O. Box 365, Oneida, WI 54155

Red Cliff Band of Lake Superior Chippewa Indians in Wisconsin

Phone: 715 779-3700
E-mail: judyps@ncis.net

Red Lake Band of Chippewa in Minnesota

Phone: 218 679-3959; Fax: 218 679-2830
Mailing Address: P.O. Box 279, Red Lake, MN 56671

White Earth Band of Chippewa in Minnesota

Phone: 218 935-2488; Fax: 218 935-2524
E-mail: welakes@tvutel.com
Mailing Address: 2209 271st Avenue Unit 2, Mahnomen, MN 55720

EPA Region 6 (AR, LA, NM, OK, TX)

EPA Regional Tribal Coordinators

Municipal solid waste:
Anan Tanbouz, 214 665-8195

Hazardous waste:
Ann Zimmerman, 214 665-8532
First Interstate Bank Tower, 1445 Ross Avenue, Suite 1200, Dallas, TX 75202-2733

Alabama-Coushatta Tribe of Texas
Phone: 936 563-4391
Mailing Address: Route 3, Box 640, Livingston, TX 77351

Delaware Nation in Oklahoma
Phone: 405 247-2448; Fax: 405 247-9393
E-mail: aapanahkih@westerndelaware.nsn.us
Mailing Address: P.O. Box 825, Anadarko, OK 73005

Jicarilla Apache Tribe in New Mexico
Phone: 505 759-3242

Pawnee Nation in Oklahoma
Phone: 918 762-3655; Fax: 918 762-6446
E-mail: cri@cimtel.net
Mailing Address: P.O. Box 470, Pawnee, OK 74058

Seminole Nation in Oklahoma
Phone: 405 382-5112; Fax: 405 382-3211
E-mail: mdouglas@mbo.net
Mailing Address: P.O. Box 1603, Seminole, OK 74818-1603

Zuni Pueblo in New Mexico
Phone: 505 782-4481
Mailing Address: P.O. Box 339, Zuni, NM 87327

EPA Region 8 (CO, MT, ND, SD, UT, WY)

EPA Regional Tribal Coordinators
Municipal solid waste and hazardous waste:
Ron Lillich, 303 312-6149 and Susanna Trujillo, 303-312-7008
999 18th Street, Suite 500, Denver, CO 80202-2466

Region 8 Montana Office
Municipal solid waste and hazardous waste:
Stephanie Wallace, 406 457-5018

Hazardous waste:
Susan Zazzali, 406 457-5019
301 S. Park, Drawer 10096, Helena, MT 59626-0096

Assiniboine and Sioux Nations of Fort Peck Reservation in Montana
Phone: 406 768-5155
Mailing Address: Fort Peck Reservation, P.O. Box 1027, Poplar, MT 59255

Cheyenne River Sioux Tribe in South Dakota
Phone: 605 964-4155; Fax: 605 964-4151
E-mail: crstchrm@rapidnet.com
Mailing Address: Box 590 Main Street, Eagle Butte, SD 57625

Oglala Sioux Tribe of the Pine Ridge Reservation in South Dakota
Phone: 605 867-5236
Mailing Address: P.O. Box H, Pine Ridge, SD 57770

Rosebud Sioux Tribe in South Dakota
Phone: 605 856-5644; Fax: 605 856-5647
E-mail: resource@gwtc.net
Mailing Address: Resource Development Office, PO Box 517, Rosebud, SD 57570

Spirit Lake Tribe in North Dakota
Phone: 701 766-4221
Mailing Address: Tribal EPA Office, P.O. Box 99, Fort Totten, ND 58335

EPA Region 9 (AS, AZ, CA, GU, HI, NV)

EPA Regional Tribal Coordinators
Municipal solid waste:
Kelly Doordan, 415 972-3383

Hazardous waste:
Rebecca Jamison, 415 972-3382
75 Hawthorne Street, San Francisco, CA 94105

Blue Lake Rancheria in California
Phone: 707 668-5101
Mailing Address: P.O. Box 428, Blue Lake, CA 95525

Campo Band of Mission Indians in California
Phone: 619 478-9046
Mailing Address: 36190 Church Road, Suite 1, Campo, CA 91906

Fallon Paiute-Shoshone Tribes in Nevada
Phone: 775 423-6075
Mailing Address: 8955 Mission Road, Fallon, NV 89406

Fort McDowell Yavapai Nation in Arizona
Phone: 480 837-5121
Mailing Address: P.O. Box 17779, Fountain Hills, AZ 85269

Gila River Indian Community in Arizona
Phone: 520 562-2234; Fax: 520 562-2245
E-mail: mariella@gilanet.net
Mailing Address: P.O. Box 97, Sacaton, AZ 85247

Hopi Tribe of Arizona
Phone: 928 734-2441
Mailing Address: P.O. Box 123, Kykotsmovi, AZ 86039

Manzanita Band of Mission Indians in California
Phone: 619 766-4930
Mailing Address: P.O. Box 1302, Boulevard, CA 91905

Quechan Indian Tribe in Arizona
Phone: 619 572-0213; Fax: 619 572-2102
Mailing Address: Quechan Indian Tribe, P.O. Box 1899, Yuma, AZ 85366-1899

San Carlos Apache Tribe in Arizona
Phone: 520 475-2218; Fax: 520 475-2268
E-mail: scatepa@mail.theriver.com
Mailing Address: P.O. Box 0, San Carlos, AZ 85550

Smith River Rancheria in California
Phone: 707 487-9255
Mailing Address: 250 North Indian Road, Smith River, CA 95567

Walker River Paiute Tribe in Nevada
Phone: 775 773-2306
Mailing Address: P.O. Box 220, Schurz, NV 89427

White Mountain Apache Tribe of Arizona
Phone: 520 338-4346
Mailing Address: P.O. Box 700, Whiteriver, AZ 85941

EPA Region 10 (AK, ID, OR, WA)

EPA Regional Tribal Coordinators
Municipal solid waste:
Fran Stefan, 206 553-6639
Hazardous waste:
Nina Kocourek, 206 553-6502
1200 Sixth Avenue, Seattle, WA 98101

Confederated Tribes of the Warm Springs Reservation of Oregon
Phone: 541 553-4943

Confederated Tribes of the Umatilla Indian Reservation in Oregon
Phone: 541 276-4040
Mailing Address: Confederated Tribes of the Umatilla Indian Reservation, PO Box 638, 72292 South Market Road, Pendleton, OR 97801

Makah Tribe of Indians in Washington State
Phone: 360 645-2201
Mailing Address: P.O. Box 115, Neah Bay, WA 98357

Nez Perce Tribe of Idaho
Phone: 208 843-2820

Spokane Tribe of Indians in Washington State
Phone: 509 258-4581
Mailing Address: P.O. Box 100, Wellpinit, WA 99040

EPA Region 10—Alaska Field Office

EPA Regional Tribal Coordinators
Municipal solid waste:
Jean Gamache, 907 271-6558
West 7th Avenue, #19, Anchorage, AK 99513

Galena Village, Alaska
Phone: 907 656-1711

Metlakatla Indian Community in Alaska
Phone: 250 628-3234

Native Village of Barrow-Inupiat Traditional Government in Alaska
Phone: 907 852-4411 or 800 478-4412; Fax: 907 852-8844

National and Regional Sources of Information and Training

Alaska Inter-Tribal Council
Phone: 907 563-9334; Fax: 907 563-9337
Web Site: www.aitc.org
Mailing Address: 431 W. 7th Avenue suite 201, Anchorage AK, 99501

Alaska Native Health Board (ANHB)
Phone: 907 562-6006; Fax: 907 563-2001
Web Site: www.anhb.org
Mailing Address: 3700 Woodland Drive, Suite 500, Anchorage, AK, 99517

Association of State and Territorial Solid Waste Management Officials (ASTSWMO)
Phone: 202 624-5828; Fax: 202 624-7875
Web Site: www.astswmo.org
Mailing Address: 444 North Capitol Street, NW Suite 315, Washington, DC. 20001

Institute for Tribal Environmental Professionals (ITEP) and Northern Arizona University Solid Waste Training for Alaskan Native Villages

Phone: 928 523-9555; Fax: 928 523-1266
Web Site: www4.nau.edu/itep/s_waste.html
E-mail: ITEP@nau.edu
Mailing Address: The Institute for Tribal Environmental Professionals, Northern Arizona University, P.O. Box 15004, Flagstaff, AZ 86011

Inter Tribal Council of Arizona (ITCA)

Phone: 602 258-4822; Fax: 602 258-4825
Web Site: www.itcaonline.com
Mailing Address: 2214 North Central Avenue, Suite 100, Phoenix, AZ 85004

Inter-Tribal Environmental Council (ITEC)

Phone: 918 458-5498; Fax: 918 458-5499
Web Site: www.itecmembers.org
Mailing Address: P.O. Box 948, Tahlequah, OK 74465-0948

National Tribal Environmental Council

Jerry Pardilla, Executive Director
Phone: 505 242-2175; Fax: 505 242-2654
Web Site: www.ntec.org
E-mail: jpardilla@ntec.org
Mailing Address: 2501 Rio Grande Blvd., Suite A, Albuquerque, NM 87104

National Tribal Environmental Research Institute (NTERI)

Web Site: www.nteri.net

Solid Waste Association of North America (SWANA)

Phone: 800 GO-SWANA (800 467-9262); Fax: 301 589-7068
Web Site: www.swana.org
E-mail: info@swana.org.
Mailing Address: P.O. Box 7219, Silver Spring, MD 20907-7219
Street Address: 1100 Wayne Avenue, Silver Spring, MD 20910

Tribal Association for Solid Waste & Emergency Response (TASWER)

Phone: 202 331-8084; Fax: 202 331-8068
Web Site: www.taswer.org
E-mail: contact@taswer.org
Mailing Address: 1001 Connecticut Avenue, NW, Suite 400, Washington, DC 20036

U.S. Environmental Protection Agency (EPA)

Waste Management in Indian Country provides information to help tribes address MSW management needs. Readers can download funding guides, technical documents, the *Tribal Waste Journal*, educational materials, and more. The Web site describes MSW regulations, new developments, upcoming conferences, valuable links, and tribes' successful programs.

Phone: 202 566-1886; Fax: 202 566-1908
Web Site: www.epa.gov/tribalmsw
Mailing Address: US EPA, Office of Solid Waste (5305W), 1200 Pennsylvania Avenue, NW, Washington, DC 20460

American Indian Environmental Office (AIEO) coordinates an Agency-wide effort to strengthen environmental protection in Indian Country. AIEO oversees development and implementation of the Agency's Indian Policy and ensures that the agencywide implementation of its Indian Program is consistent with the Administration's policy to work with tribes on a government-to-government basis to protect tribal health and environments.

Phone: 202 564-0303; Fax: 202 564-0298
Web Site: www.epa.gov/indian
Mailing Address: USEPA, AIEO, Mail Code: 4104M, 1200 Pennsylvania Avenue, NW, Washington, DC 20460

Appendix C: Sample Public Education Tools Used by Tribes

- The Metlakatla Indian Community Environmental Office sponsored a series of posters to encourage people to reduce, reuse, and recycle. <www.epa.gov /epaoswer/non-hw/tribal/pdftxt/ metlakatla.pdf>
- The St. Regis Mohawk Tribe Environmental Division sponsored a series of comic strips called *Kwis & Tiio: Solid Waste Management on the 'Rez* to increase the community's awareness of proper solid waste management practices and to illustrate how people's disposal practices directly impact our environment. <www.epa.gov/epaoswer/non-hw/tribal/pdftxt/cartoon.pdf>
- St. Regis Mohawk Tribe PAYT Program Brochure <www.northnet.org/earth/ payt_br.htm>
- Fond du Lac Band of Lake Superior Chippewa Tribe's environmental brochure to educate residents about illegal dumping. <www.fdlrez.com/nr/environmental/ stewardshipbrochure.htm>

United States Environmental Protection Agency
Solid Waste and Emergency Response (5306W)
EPA530-R-03-013
November 2003
www.epa.gov/tribalmsw