Integrated Waste Management Plan (IWMP)
2012

Montana Department of Environmental Quality
Energy and Pollution Prevention Bureau
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Integrated Waste Management Plan (IWMP) 2012

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IWMP Task Force members include:

(TBD)

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Executive Summary

To Be Written at Finalization

Chapter 1: INTRODUCTION

Background

Montana's Constitution guarantees the right to a clean and healthful environment for our and future generations. Under this charter, the Montana Legislature passed the Integrated Waste Management Act in 1991, which includes the mandate for an Integrated Solid Waste Management Plan. This plan strives to strike a balance between managing waste and conserving resources.

The plan sets forth an agenda that focuses on the 3 Rs — Reduce, Reuse, and Recycle — ultimately hoping to divert 25% of the state's municipal solid waste from entering landfills. This mandate focuses on reducing the amount of waste in the state of Montana, that, in turn, focuses on recovering energy and raw materials when possible, and looking to landfills only after these other options have been exhausted.

There are several reasons why it is important to reduce the amount of waste that is produced. The first is the impact that solid waste disposal has on land resources. While Montana may seem to have an abundance of land that can be used for landfills, other potential uses for the land and uses of adjoining land create conflict. Property owners are not anxious to have a landfill adjoin their property. It is more and more difficult to develop new landfill sites. Reducing the volume of waste entering landfills extends the life of existing landfills.

The second reason to reduce the amount of material entering landfills is to reduce potential long-term environmental impacts of materials in landfills. While new landfills are designed to entomb wastes and perform very well, the materials placed in landfills will stay there for generations and will require long-term monitoring to ensure public safety. Reducing the toxicity of materials and providing alternatives for disposal of certain materials will protect human and environmental health.

The third reason to implement an integrated approach to solid waste management is one of global responsibility. The United States has just 5% of the world's population, yet uses 25% of the world's resources. Waste that is not recovered or prevented often involves an irrecoverable loss of energy and resources. The acquisition of raw materials, the manufacture or refinement of materials and the product manufacture are all phases of production that use energy and create waste before the use or consumption of a product.

For a product or one similar to it to be made again, without recycling, these initial phases of manufacture are needlessly repeated. Our first viewing of a product is often at the time of purchase, so these costs and impacts are often difficult to perceive. The use of more of the world's resources includes use of oil and other nonrenewable energy resources to process the raw materials and manufacture goods. This has the inherent risks of oil spills, increased prices and continued dependence on unstable regions of the world for economic and domestic security.

Content and Purpose of the Plan

The Integrated Waste Management Act requires DEQ to prepare and implement a state solid waste management plan. The plan is a policy document to provide guidance for the state of Montana in implementing an integrated approach to solid waste management. The original Integrated Solid Waste Management Plan was written in 1994. That plan was to be reviewed every five years and updated as necessary. The plan was reviewed in 1999 and determined to be adequate at that time. When the plan was reviewed again in 2005, it was determined that updates were needed and the plan was fully updated in 2006. Another review was conducted in 2011, and although much of the 2006 document was still relevant, it was decided that an update would be completed. Hence, this 2012 Montana Integrated Solid Waste Management Plan provides current information, assesses the state of solid waste management, and makes recommendations on how to meet the goals established in the Integrated Waste Management Act.

This plan may also serve as a guidance document and educational tool for local and tribal governments as they plan for solid waste management in the coming decades. The plan does not place requirements on local or tribal governments, citizens, or the private sector. Rather, it invites these stakeholders to participate in solid waste management at the state level and encourages local action.

The plan seeks to be forward-looking and practical. It sets long-term goals for substantial solid waste reduction. Further, it assesses alternative strategies for reaching that goal and makes recommendations for practical next steps the state and local governments must take to reach those goals.

The primary purpose of the plan is to set direction for the next five years. The plan will be a continually evolving document. Information and policies in the area of solid waste management will continue to change; therefore, to remain current and relevant, the plan must change along with them. DEQ will review the plan regularly and update it as needed. Specific requirements of the plan are outlined in the Integrated Solid Waste Management Act located in Appendix A.

Roles and Responsibilities

Once the minimum standards set by the federal government are met, solid waste management becomes the concern of many segments of Montana's economy and society. Tribal, state, and local governments, the legislature, the private sector, and citizens each have specific roles and responsibilities.

Federal Government

The U.S. Congress passed the Resource Conservation and Recovery Act (RCRA) in 1976. It banned open dumping of waste and required the federal Environmental Protection Agency (EPA) to adopt regulations that define and prohibit open dumping and establish criteria for states to use when regulating the disposal of solid waste, especially municipal solid waste, which can break down and cause ground water contamination if not properly managed.

Municipal solid waste (MSW) is regulated under Subtitle D of RCRA, which encourages environmentally sound disposal practices and recovery of resources. The federal regulations that implement Subtitle D, found at Volume 40 of the Code of Federal Regulations in part 258 (40 CFR Part 258), specifically establish technical standards for siting, design, operation, closure, postclosure, financial assurance, groundwater monitoring, and corrective action for municipal solid waste landfills (MSWLFs).

The Clean Air Act requires incinerators to meet performance standards that limit toxic emissions to the air by using the best available technology. The Clean Water Act affects waste disposal facilities that generate leachate or discharge to surface waters.

The Montana State Legislature

The legislature has enacted laws regulating management of solid waste and conservation of resources. These laws and the administrative rules adopted under them must meet the minimum requirements of federal law, but may set more stringent standards. The primary laws regulating solid waste are:

1. The Solid Waste Management Districts Act (Title 7, Chapter 13, Part 2, Montana Code Annotated (MCA).

2. The Montana Environmental Policy Act (Title 75, Chapter 1, Parts 1-3, MCA)

3. The Montana Solid Waste Management Act (Title 75, Chapter 10, Parts 1 and 2, MCA)

4. The Integrated Waste Management Act (Title 75, Chapter 10, Part 8, MCA)

5. The Infectious Waste Management Act (Title 75, Chapter 10, Part 10, MCA)

State Government

The legislature has delegated to DEQ the authority to license, regulate, and inspect solid waste facilities, to write and implement an integrated solid waste management plan, to provide technical assistance to solid waste facility operators and decision-makers and to serve as an information and educational clearinghouse to the public for integrated waste management issues. These functions are shared between the Permitting and Compliance Division that licenses and inspects solid waste facilities and the Planning, Prevention and Assistance Division that provides education and assistance in developing markets for materials that would otherwise be considered wastes.

DEQ has adopted administrative rules reflecting the requirements of the federal regulations found in 40 CFR Part 258 (Subtitle D Regulations) and EPA has approved DEQ's regulatory program. Therefore, within the state of Montana, the state has the main responsibility of regulating the disposal of solid waste. EPA shares that authority in Indian Country. The state's responsibility is discussed in Chapter 2. DEQ also has responsibility for air quality, water quality, and superfund cleanup in Montana. These programs affect solid waste management issues in certain situations.

DEQ will examine the recommendations and strategies in this plan to determine what practices, guidelines and regulations need revision as Montana moves forward toward integrated waste management.

Local Government

Local governments are responsible for assuring that the planning, financing, designing, constructing, and operating of solid waste management systems are consistent with the state's solid waste management plan and applicable state laws and regulations. They may also contract with the private sector for these functions. County commissioners have the authority to create solid waste management districts for the purpose of collection and/or disposal of MSW. The districts may include cities and towns, and parts or all of one or more counties.

Local governments are responsible for involving the public in solid waste decision-making. Using a combination of public input and the information presented in this plan, they are asked to develop and implement integrated waste management strategies that will help the state achieve its waste reduction goals.

Tribal Government

There are 10 federally recognized Indian tribes on seven reservations covering more than 8.3 million acres in Montana. Tribes are required to comply with all federal laws and regulations mentioned above. Regardless of complex legal questions around state authority for solid waste management on reservations, all parties recognize that environmental impacts and issues are not contained by jurisdictional boundaries.

Because there is a common interest in planning for effective and environmentally sound solid waste management, tribal governments are encouraged to consider the recommendations presented in this plan and work with neighboring local governments for area-wide solutions to disposal, recycling and waste reduction. The State-Tribal Cooperative Agreements Act has defined legal issues and jurisdictional boundaries.

The Private Sector

Private solid waste management companies have played an active role in Montana. Due to increasing costs of waste management, private participation is likely to expand in the future. The Solid Waste Management Act sets the policy that "private industry is to be utilized to the maximum extent possible in planning, designing, managing, constructing, operating, manufacturing, and marketing functions related to solid waste management systems." The Act then reaffirms that local governments retain primary responsibility for adequate solid waste management including the overall planning, financing, and operation of the entire solid waste management system.

Private businesses are key to the success of source reduction, recycling, and composting. Very small businesses to large industries are important in managing wastes and in creating markets for recycled goods. There are both economic and social benefits to the businesses that use recycled materials in their products. This plan will help private industry understand the direction the state is headed in solid waste management so they can make better business decisions. The state cannot meet its waste reduction goals without the cooperation and participation of the private sector.

All private businesses, whether or not they are associated with solid waste management, are encouraged to adopt appropriate recommendations for integrated waste management as presented in this plan. Businesses should make a commitment to implementing waste reduction measures in their purchasing and operations.

Citizens

Citizens are encouraged to take every opportunity to attend meetings and public hearings to learn about, help develop and participate in integrated waste management opportunities in their communities. Citizens have a responsibility to seek out accurate information on waste management options and to take personal measures to help the state achieve waste reduction. Ultimately, it is the citizens of Montana who are served by this plan.

Individuals may also use this plan to inform themselves and local decision-makers about the direction in which the state is headed in solid waste management. They may use it to encourage local decision-makers to form citizens' advisory committees and to involve the public in solid waste management through public meetings, workshops and presentations to civic

organizations, schools and churches. They may use it to encourage their local waste managers, institutions, businesses, or community organizations to write and implement a local solid waste management plan.

A Vision for Montana

Montana citizens will be fully informed about waste management options. Montanans will choose to participate in planning and implementing waste reduction strategies in their communities and homes. Products will be designed to last longer and will be sold with less packaging. Environmentally safe alternatives will be readily available for all hazardous products. Waste facilities will become community resource centers as more broken products are repaired and more old products are reused. More resources will be recovered through recycling. More organic wastes will be recycled through composting. The remaining amount of waste will go to a landfill where the best available technology will be operating to protect the environment.

Chapter 2: SUBTITLE D

Nonhazardous Solid Wastes

Municipal solid waste (MSW) is regulated by EPA under Volume 40 of the Code of Federal Regulations, parts 257 and 258. Commonly referred to as "Subtitle D," these regulations specify minimum criteria for municipal landfills, including location, operation, design, groundwater monitoring, corrective action, closure and postclosure care, and financial assurance.

Subtitle D also includes regulations pertaining to garbage, such as food containers and coffee grounds; non-recycled household appliances; residue from incinerated automobile tires; refuse such as metal scrap and construction materials; sludge from industrial and municipal waste water facilities; and drinking water treatment plants. Hazardous waste exempted from Subtitle C regulations—such as those from households and conditionally exempt, small-quantity generators—also fall under Subtitle D.

As the regulatory agency for Subtitle D, EPA approved the State of Montana's MSW program in 1993 (as defined by ARM 17.50.501 through 17.50.542) that was adopted by DEQ under the authority of the Montana Solid Waste Management Act (MCA 75-10, sections 201-233). Montana's program protects public health and the environment, while providing the maximum flexibility allowed by EPA in setting alternative standards for the siting, design, operation, monitoring, and closure of municipal landfills.

The following sections summarize the criteria in 40 CFR Part and 258 and compare them with Montana regulations.

Subpart A - Small Community Exemption

Small MSW landfills that meet all of the following criteria may be exempted by DEQ from landfill design criteria described in ARM Title 17.50, subchapters 12 and 13:

- Receive less than 20 tons of waste per day on an annual average;
- Have no evidence of existing groundwater contamination from the landfill;
- Receive 25 inches or less of precipitation per year; and
- Serve a community for which no practicable waste management alternative exists.

DEQ considers "practicable waste management alternative" to mean a complying MSW landfill, transfer station, or materials recovery facility within 100 miles of the small community landfill that can accept waste for an annual cost of less than 1% of the median household income.

If an exemption is granted, all location, operation, closure and postclosure care, groundwater monitoring, and corrective action requirements still apply. These landfills must also comply with all financial assurance requirements. DEQ has the authority to revoke an exemption if any groundwater contamination is found or if any of the required conditions can no longer be met.

The small community exemption is rarely granted as there is little need for it. DEQ has the flexibility to approve alternative design criteria based on geologic features, which is more protective of the environment than exemptions based on size. In addition, many small landfills have closed over the past 21 years because of the costs associated with required groundwater monitoring, methane monitoring, and financial assurance requirements. Finally, most Montana communities have a "practicable alternative" within 100 miles.

Subpart B - Location Criteria

MSW landfills cannot be located or operated in wetlands without a DEQ approved demonstration, floodplains, fault areas, seismic impact zones or unstable areas. Since landfills attract seagulls, crows, vultures, and other scavenger birds, MSWLFs cannot be located with 10,000 feet of an airport that has jet aircraft landing or taking off, or within 5,000 feet of airports used by propeller aircraft. Exceptions may be made if the operator of the landfill can demonstrate that the facility does not pose a bird hazard to aircraft.

Much of western Montana lies in seismic impact zones. DEQ has the authority to approve landfills in seismic impact zones if all containment structures are designed to adequately resist the expected impact of an earthquake.

Landfills that existed in restricted areas before the 1993 passage of the regulations were evaluated on a site-specific basis. Those sites that were designed, or which could be re-engineered, to address the issues, were allowed to continue operation. Even so, 50% of Montana's landfills have been closed since 1994.

Subpart C - Operational Criteria

Owners and operators of MSW landfills must comply with the following operational standards:

- Implement procedures for prohibiting the dumping of regulated hazardous wastes and PCB wastes.
- Conduct random inspections of incoming loads, maintain records of inspections, train workers to recognize hazardous waste, and notify state and/or federal officials of unauthorized materials.
- Cover disposed waste with six inches of earthen material at the end of each operating day (but more frequently if necessary).
- Prevent or control populations of disease vectors such as rodents.
- Ensure that the concentration of methane gas generated by the landfill does not exceed set limits at the facility boundary by implementing methane monitoring programs and, if methane gas concentrations do exceed those limits, take necessary steps to reduce them, while also notifying DEQ.
- Ensure that the landfill meets all applicable air quality standards.
- Conduct open burning according to applicable regulations and never burn mixed MSW.
- Control public access, prevents unauthorized traffic, and prevents illegal dumping.

- Design the landfill to prevent run-on to its active portion during the peak of a 25-year storm.
- Control run-off from the active portion of the landfill in the event of a 24-hour, 25-year storm.
- Prevent the discharge of pollutants into any water in violation of federal or state standards.
- Refuse to accept bulk, non-containerized, or large containers of liquid wastes.
- Record and retain information relating to all aspects of ARM 17.50.11-12.
- Record a notation to the deed of the land where the facility is located that notifies any potential purchaser of the land in perpetuity that the land is being used for a solid waste management system, and its use is restricted under ARM 17.50.1404(3)(c).

Under ARM Title 17. 50, subchapters 5 and 10-14, DEQ has the authority to approve alternate daily cover that meets performance standards, provide some flexibility governing the number and location of methane monitoring wells, and approve alternate waste-screening methods if the landfill operator is able to ensure that incoming loads do not contain regulated hazardous or PCB-containing waste. Federal law, however, does not allow any state to waive random inspections for hazardous waste, methane monitoring, groundwater monitoring, run-on/run-off controls, and recording-keeping requirements.

Subpart D - Design Criteria

MSW landfills must employ design standards that have been proven to be protective of human health and the environment in most circumstances. These design standards include a composite liner and leachate collection system for any new landfill or for the expansion of an existing landfill. The liner consists of a layer of compacted soil and a flexible, 30-ml, high-density polyethylene membrane. (See ARM 17.50. 1204).

Montana DEQ may accept alternative designs, based on performance standards and local geological and hydro-geological conditions, allowing the use of other technologies that the applicant can demonstrate is protective of the environment in site-specific circumstances. For example, in areas where natural clay soils are unsuitable, a geo-synthetic clay liner may be approved. DEQ also has the authority to approve various low-cost options for leachate collection systems and alternative landfill covers, depending on site-specific circumstances.

Subpart E - Ground Water Monitoring and Corrective Action

Under ARM Title 17.50, subchapter 13, all MSW landfills must monitor ground water. Each monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer. Each system must include sampling of wells up-gradient and down-gradient from the landfill. An operator must conduct monitoring semiannually over the life of the landfill and during the postclosure period. Samples must be analyzed for at least 15 heavy metals and 47 volatile organic compounds.

If elevated levels of any of these metals or compounds are detected, the operator must implement an assessment monitoring program as specified in ARM 17.50. 1307. If groundwater monitoring shows that contamination exceeds legal limits, the regulations prescribe a corrective action program.

DEQ has the authority to suspend monitoring requirements if the landfill operator can demonstrate that there is no potential for contamination of ground water.

Subpart F - Closure and Postclosure

Under ARM Title 17, chapter 50, subchapter 14, all MSW landfills must prepare and a closure and postclosure care plan, and submit it to DEQ for approval. The closure process must include DEQ notification of when the closure will occur, placement of a final cover over the landfill, and recording a notation on the property deed that landfilling has occurred on the property. This final cover must be designed to minimize infiltration and erosion. The design features of the final cover are specified in the rules (ARM 17.50.1403) and include minimization of infiltration and erosion; however, DEQ has the flexibility to allow an alternative final cover design based on site-specific conditions.

The postclosure plan must describe the integrity and effectiveness of the final cover, as well as the leachate collection system, groundwater monitoring system, and the gas monitoring system, and outline how all will be maintained for 30 years after closure. DEQ may choose to approve extensions of deadlines for closure, increase or decrease the postclosure monitoring period or frequency, and even allow the operator to suspend monitoring entirely.

Subpart G - Financial Assurance

Under ARM 17.50.540, landfill operators are required, to provide an annual cost estimate for a third party to perform closure, postclosure care, and any corrective action. They are also required to provide and fund "financial assurance," which will enable DEQ to pay these costs should the operators run out of funds. The mechanism may be a trust fund, insurance policy, surety bond, letter of credit, local government financial test, or a combination of these.

Chapter 3: SOLID WASTE CHARACTERIZATION

Montana Municipal Solid Waste (MSW)

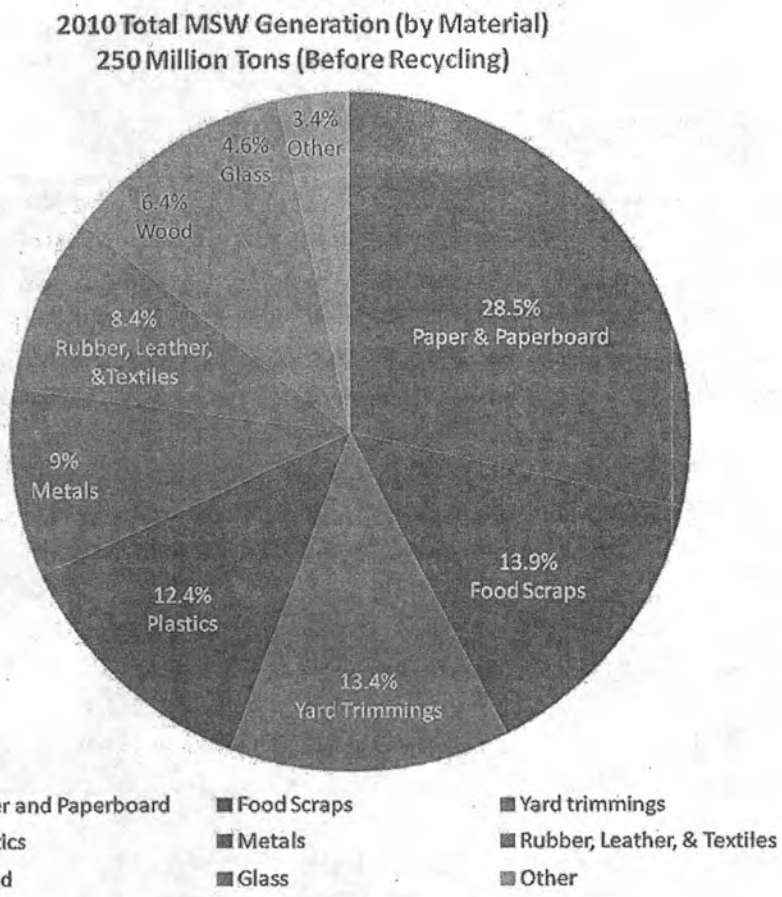
Municipal solid waste (MSW) refers to those materials that historically have come from municipal sources with disposal at municipal landfills. MSW may be generated in residential, commercial, institutional, or industrial settings. MSW includes packaging, newspapers, miscellaneous paper, magazines, glass and plastic bottles, cardboard, aluminum and steel cans, wood pallets, food scraps, yard waste, furniture, appliances, tires, electronics, clothing, and batteries. These materials may be characterized by product type or by material.

Surveys conducted by Montana DEQ indicate that the generation of MSW in Montana increased from 743,631 tons in 1991 to 1,360,378 tons in 2010, and that per-capita waste generation increased from 5.0 pounds per day to 6.1 pounds per day. Using the 2010 census estimate of 989,414, each day every Montanan contributed an average 7.5 pounds to the state's landfills, recycled 1.47 pounds, and diverted .38 pound of solid waste. On a national level, EPA reports a lower average, with 2.4 pounds per U.S. resident per day destined for a landfill.

The actual picture of waste generation in Montana is not as clear as these statistics, however. First, it is difficult to evaluate waste generation within the state prior to passage of Subtitle D in 1991 as there were no regulations, nor any standardized measurement. Only a few Class II landfills had scales in early 1990s. Most facilities estimated weight as a function of volume, and since licensing fees were based on landfill tonnage, it was economically advantageous for facilities to be conservative in their volume estimates. (In fact, one such facility reported a 150% increase in tonnage after scales were installed.) Other landfills simply estimated waste tonnage based on population.

In addition, half of the licensed facilities in Montana closed between 1991 and 1994, making it impossible to determine how closely tonnage estimates from those facilities approached actual values. The lack of uniformity and accuracy in waste measurement, therefore, casts doubt on the 1991 data.

Montana's per-capita waste generation statistics are also somewhat skewed as they include wastes that do not meet the standard definition of municipal solid waste. For example, construction, and demolition, and industrial wastes are not considered true municipal solid wastes, yet they often end up in Class II landfills in Montana because there is no other place for them. In many instances, these wastes are disposed of and weighed with municipal solid waste, falsely elevating state MSW totals. The chart below shows the breakout of Montana MSW for 2010.



Solid Waste Importation Into Montana

Montana's moratorium on importation of out-of-state waste ended in 1993. Since then, states have engaged in an interstate cooperation in the management of solid waste. Given the demographics of Montana and its neighboring states, the most efficient and reasonable management of waste may very well involve transporting it across state borders. Montana imports solid waste from communities in Wyoming, North Dakota, and Washington, as well as from Yellowstone National Park. Montana exports solid waste to communities in Idaho and North Dakota.

Montana assesses a fee of $0.27 cents per ton of imported solid waste in addition to the standard volume-based disposal fee of $44per ton. This fee is based on actual administrative costs to the state of Montana. The total imported tonnage for the five facilities accepting out-of-state waste has averaged 34,460 from 1996 through the first quarter of 2012. Although export tonnages are not tracked by DEQ, the agency estimates that exports and imports are well balanced.

Chapter 4: INTEGRATED WASTE MANAGEMENT

Policy: The State of Montana plans and implements an integrated approach to solid waste management, based on the following order of priority:

1. Reduction of waste generated at the source
2. Reuse
3. Recycling
4. Composting of biodegradable waste
5. Landfilling or incineration

Goal: Using the solid waste hierarchy, state and local governments will work together to implement strategies to meet solid waste diversions targets.

What Is Integrated Waste Management and Why this Goals?

Integrated waste management is defined in Montana state law as "the coordinated use of a priority of waste management methods, including waste prevention, or specified in 75-10-8014." The purpose of managing wastes in an integrated and prioritized way is to effectively handle municipal solid waste with the least adverse impact on human health and the environment. The Montana Integrated Waste Management Act, passed in 1991, established integrated waste management as the policy for the state and established the priorities for waste management described in the policy statement above. In addition, the Montana Integrated Solid Waste Management Act set a solid waste reduction target, required state government to implement source reduction and recycling programs and to procure recycled supplies and materials, and required a state solid waste management plan to be prepared and implemented.

The Montana Integrated Solid Waste Management Plan was first published in July of 1994 after considerable involvement on the part of the Department of Health and Environmental Sciences (now DEQ), local governments, solid waste managers, educational groups, environmental and recycling organizations, and citizens. While much progress has been made in integrated solid waste management since 1994, many of the issues remain the same. Landfilling continues to be the most common method of waste disposal, and challenges continue to exist with source reduction, reuse, recycling, and composting options. The benefits of integrated waste management also remain very much the same.

Montana adopted an integrated waste management policy because, in the long term, it makes sense, environmentally, and economically. While landfilling may be the cheapest method of waste management, compliance with federal and state regulations to protect public health and the environment have increased costs of landfilling significantly. Postclosure costs will have an impact on local governments well after they are closed. New landfills are more difficult to site,

more expensive to construct and operate, and more controversial to the public. Space in well-sited, well-designed, and well-operated landfills is a valuable commodity to be conserved for waste that cannot be handled effectively by other methods. Source reduction, reuse, recycling, and composting all prolong the life of landfills, recognizing the value of this space. In addition, integrated waste management conserves valuable energy and natural resources.

The 25% Waste Reduction Goal

The 1991 Legislature set a 25% waste reduction goal to influence the direction and policy of solid waste activities in state government and to inspire action from tribal and local governments, the private sector, and the public. This very ambitious goal was to be accomplished by 1996. Excellent progress has been made toward meeting the goal, but 25% diversion has not yet been met. Unfortunately, it is difficult to quantify the true amount of waste diversion as DEQ cannot calculate how much waste was diverted through source reduction, reuse, and home compositing. Recycling and diversion data is more available, but Montana does not require reporting of the amount of materials collected for recycling, and often this information is considered proprietary. Although available data suggests that Montana has greatly increased the amount of solid waste recycled, reused, and composted, the overwhelming majority of solid waste in Montana continues to be landfilled.

The 25% reduction goal was to be measured against the 1991 waste disposal baseline of 743,631 tons and adjusted for population. Readers should note that the 25% goal is not a recycling goal but a waste reduction goal. In other words, the reduction can take place through recycling and composting, but also through source reduction and reuse. As noted earlier, source reduction and reuse are particularly difficult to measure. DEQ has developed surveys to better identify and track both the volume of waste generated and the amount of material recycled.

The 2006 Plan adopted target goals by year, these goals were:

- 17% of the state's solid waste referenced in subsection (1) by 2008
- 19% of the state's solid waste referenced in subsection (1) by 2011
- 22% of the state's solid waste referenced in subsection (1) by 2015

Since the 2006 update, Montana has met the 2008 and 2011 diversion targets. A summary of diversion amounts since 2006 is as follows:

- 2006 – 19.7%
- 2007 – 19.1%
- 2008 – 19.6%
- 2009 – 18.3%
- 2010 – 18.6%
- 2011 TBD – include in final document

Proposed New Goal

This plan adopts an updated solid waste reduction goal and a recycling and composting target. This target aims to increase the amount of material that is recycled or composted, while maintaining the focus on source reduction and reuse as high priorities in reducing the amount of solid waste that must be disposed of.

"75-10-803. Solid waste reduction goal and targets target. (1) It is the goal of the state, by January 1, 1996, to reduce by at least 25% the volume of solid waste that is either disposed of in a landfill or incinerated to reduce, through source reduction, reuse, recycling, and composting, the amount of solid waste that is generated by households, businesses, and governments and that is either disposed of in landfills or burned in an incinerator, as defined in 75-2-103.

(2) Targets for the rate of recycling and composting are:

(a) TBD of the state's solid waste referenced in subsection (1) by TBD;
(b) TBD of the state's solid waste referenced in subsection (1) by TBD; and
(c) TBD of the state's solid waste referenced in subsection (1) by 2TBD.

DEQ estimates that about 19.5% of the state's solid waste stream currently is diverted for recycling or composting. This new goal requires a steady increase in the amount of material that is diverted from the waste stream.

4.1 SOURCE REDUCTION

Policy: Source reduction is the first step in integrated waste management.

Goal: Every community will promote a source-reduction policy to reduce the amount of waste landfilled in Montana.

What Is Source Reduction and Why This goal?

Source reduction is the act of creating less waste in the first place. It can be as simple as a consumer choosing to purchase one product over another based on the amount of packaging each has, or as complex as a manufacturer reformulating product design and production to reduce toxic chemicals or increase recycled content. At all points of the spectrum, source reduction is realized with a net reduction in waste.

Section 75-10-802(7) of the Montana Integrated Waste Management Act identifies source reduction as the first step of the state's integrated waste management hierarchy and defines it as the "design, manufacture, purchase, or use of a material or product, including packaging, to reduce its amount or toxicity before it enters the solid waste stream."

Achievements made in source reduction are difficult to measure. EPA has stopped using the methodology described in the 2006 Montana Integrated Waste Management Plan and no longer provides estimates for source reduction rates. At this time, DEQ has not developed a model for estimating source reduction measures for Montana.

That said, DEQ is aware that significant source reduction measures continue to be taken by industry in response to both economic and societal pressure. The changes are driven by increasing costs for managing and disposing of solid waste, as well as consumer demand for sustainable products that do not threaten human health or the environment.

Source reduction avoids the costs of recycling, municipal composting, landfilling, and incineration while conserving natural resources and reducing pollution.

Methods of source reduction include product stewardship and decreased consumption.

Product Stewardship. EPA describes product stewardship as "a product-centered approach to environmental protection. Also known as extended product responsibility, product stewardship calls on those in the product life cycle—manufacturers, retailers, users, and disposers—to share responsibility for reducing the environmental impacts of products."

Montana has just one product stewardship law, the 2009 Mercury-Added Thermostat Collection Act (75-10-1501 MCA.). This law bans the sale of thermostats containing mercury and requires manufacturers to develop recycling programs to collect such thermostats as they are replaced.

Decreased Consumption. At the writing of the initial Integrated Waste Management Plan 1990, it estimated that developed nations were 20% of the world's population, yet used two-thirds of all resources and generated 75% of the world's pollution and waste. It is widely recognized that consumers in the United States and Europe still play an important role in driving increased use and development of natural resources for manmade products. Consumers in China, India, and other countries are expected to adopt similar behaviors, thereby further increasing the production of products which will need to be managed at end-of-life.

A decrease in consumer consumption will directly affect the amount of product and packaging waste disposed in Montana.

Environmental Issues

Source reduction is Montana's first waste management priority because it alleviates environmental problems associated with disposal by reducing the amount of waste that must be handled. Decreasing consumption and using more durable goods also reduces the manufacturing pressure, which in turn, reduces the use of energy and natural resources

Economic Issues

Implementing source reduction educational programs may be the least costly of waste management methods. Source reduction activities eliminate further handling and disposal costs, as well as any initial impacts from the use of hazardous materials in manufacturing. Public pressure to reduce toxins and other wastes continue to provide economic incentives for companies to reduce waste at the source.

Source Reduction Website Resources

www.epa.gov/dfe: EPA's Design for the Environment (DfE) certification program evaluates consumer, institutional, and industrial products for increased durability, reduced packaging, fewer hazardous ingredients, and recyclability at end-of-life. Both government and consumers can buy certified products carrying the DfE logo with confidence that the product is safer for human health and the environment.

www.greenseal.org: Green Seal is a nonprofit organization well known for its lifecycle-based sustainability standards for products, services, and companies, and its third-party certification program. Local and county governments will find the site useful when writing requests for proposals and contracts. The State of Montana includes language in RFPs and contracts that

refers to the Green Seal website and standards for cleaning products, paper products, plastic can liners and more. The general public may find the website helpful for identifying existing products that meet Green Seal standards.

www.greenerchoices.org: This Consumer Reports website provides helpful information for understanding the different "green" labels and icons that are found on products claiming to be green, as well as comprehensive lists of products determined to be environmentally preferable based on durability, toxicity, and packaging.

2012 Barriers (Draft) to Source Reduction

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. "Eco" labels have exploded in use and can confuse consumers wishing to purchase environmentally preferable products. In addition, "greenwashing," or false claims, have become more commonplace as green products increase in sales.

2. It is often more economical to replace a product than repair it.

3. Concerns over health safety and cleanliness have created a need, or a perceived need, for additional packaging.

4. Many purchasing policies focus on purchase price rather than on costs over the life of the product. This often results in selecting products that are less durable and more expensive over the long run. Products that have a higher purchase price may be a better choice if they will last longer.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Evaluate purchasing contracts to identify opportunities for inserting language reducing packaging, requiring take-back of packaging, increased durability of products, and similar source reducing activities by state vendors.

2. Participate in local and national initiatives encouraging voluntary source reduction by industry.

3. Educate local governments and solid waste managers regarding methods of encouraging and supporting source reduction activities by businesses and citizens.

4. Work with NGOs and government partners to educate businesses about source reduction activities and benefits to their bottom line.

5. Work with NGOs and government partners to provide educational material and outreach to citizens regarding their opportunities to reduce waste through source reduction and composting.

4.2 REUSE

Policy: Reuse is the second priority method of managing solid waste materials in Montana.

Goal: All communities will plan for and support active reuse programs.

What Is Reuse and Why this Goal?

Reuse is defined as using a product in its original form for a similar or different purpose than was intended by its design. Reusing products and packaging delays their disposal as waste, and delays or even eliminates the need for a new product. As a result, raw materials are saved and transportation costs reduced.

Reuse is the second priority on the hierarchy of waste management to reduce the amount of waste disposed of in landfills. Communities can encourage reuse by organizing spring or fall cleanup days that include swaps or flea markets. Consumers begin to engage in reuse by choosing durable products that are well-made and long-lasting. 'Closing the loop' on reuse occurs when donating, selling, or giving away unwanted products to others rather than throwing them in the garbage. Landfills and transfer stations may consider setting aside areas for drop-off and retrieval of usable items if insurance policies allow.

Reuse in Montana

Most communities have a long history of informal reuse of commodities. Neighbors and family members pass usable goods from one to another, while most cities of size in Montana have at least one second-hand or thrift store with products ranging from kitchenware and clothing to yard and garden supplies, furniture, and house wares. Montanans continue their informal tradition of reusing clothing, toys, household goods, appliances, and vehicles through hosting and shopping at yard sales, supporting second-hand stores, and making donations to numerous charities.

State agencies continue to work with the Office of Public Instruction Computers for Schools Program, which sends surplus computers to schools at no cost. Since the 1999 legislation was enacted, more than 6,000 computers have been distributed to Montana public schools.

Office employees across Montana practice reuse by diverting ink and toner cartridges from immediate disposal. The cartridges retain value and are refilled or refurbished to meet manufacturer specifications before re-entering the marketplace. Purchasing refurbished cartridges and used equipment "closes the loop" on reuse. Although

quantification of these activities is beyond the scope of this document, these reuse efforts have made a substantial positive impact on waste reduction in Montana.

Environmental Issues

EPA discusses reuse as a form of source reduction because the strategy delays entry of materials into solid waste collection and disposal systems. As a result, the handling and landfilling of these materials is delayed for as long as the products have value. A smaller waste stream extends landfill life and decreases transportation costs. In addition, reuse may lessen the need for more resource extraction. Markets for reused items are generally local, eliminating transportation barriers. Reusing goods reduces the manufacturing pressure and the resulting environmental impacts associated with resource extraction, energy consumption, transportation, and pollution.

Economic Issues

Thrift stores and ink cartridge recycling businesses provide jobs and revenue in Montana. In some cases, thrift stores specifically provide jobs for disadvantaged populations, thereby increasing vocational services in rural communities. Reuse strategies lessen the time and money spent by local governments and taxpayers landfilling usable-but-undesired products. Reused products are often less expensive for consumers.

Reuse Website Resources

Online resources provide access to volumes of used products that are listed for sale locally, regionally and even globally. Many of which include an "items wanted" section. There are also online resources that host swaps of unwanted products offered for no cost, including the Montana Materials Exchange website maintained by Montana State University (www.montana.edu/mme). Other resources include telephone directories with listings by product type, such as *Furniture-Used*, and newspapers, which offer classified ads listings of used merchandise for sale. Several newspapers also offer "give-away" ads at no cost.

2012 Barriers (Draft) to Reuse

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. Planned obsolescence: Manufacturers may design products to become obsolete or more expensive to repair than replace. Technology changes rapidly. Items that still work well for their intended purpose quickly become out of date and of little perceived value to others.

2. Perceived obsolescence: Advancing technology, including the manufacture of newly created materials, continues to inspire innovations in existing products. Objects such as cellular telephones, music players, televisions, computers, etc. often can be replaced with "new and better" equipment within a few months of purchase.

3. Social acceptance: Public perception affects consumers desire to reuse goods. During hard economic times, people tend to become more willing to purchase used products; but during better economic times there may be a stigma attached with using what others have discarded.

4. Facility limitations. Salvaging at waste facilities may be limited because of liability and public health and safety issues. Reuse areas can become unsightly if not well organized.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Promote reuse as the best alternative to disposal once a product has been purchased.

2. Train solid waste managers on reuse opportunities and strategies.

3. Include signage at or near landfills and transfer stations encouraging citizens and businesses to consider reuse prior to disposal. The signs could promote local reuse resources, refer to a website, or provide contact information for additional details.

4. Promote waste exchanges

4.3 RECYCLING

Policy: Recycling is the third priority method of managing solid waste material in Montana, and includes collection, processing, and remanufacture of materials, as well as the purchasing of recycled goods.

Goal: Every community will participate in a recycling program that includes recycling all solid waste that can be practically recycled, encouraging the development of markets for collected materials, and purchasing used and recycled commodities when available. Information on the type and amount of materials that are being recycled will be collected and made available to businesses and the public.

What Is Recycling and Why this Goal?

Recycling is the remanufacture of all or part of a product to create a new product when the useful life of the product is over and no way has been found to reuse it in its original form. Recycling is a higher SWM priority than landfilling because it helps conserve valuable resources and energy. At every stage in the production of a product, virgin materials, energy, and resources are consumed. In some cases, these resources are scarce, must come from long distances, and take large amounts of energy to process.

The major steps in recycling are collection of materials; processing and transportation of those materials; conversion of the materials into useful products through remanufacturing; and finally, the purchase and use of those new products. It is important to find a balance of each of these parts of the equation. Without a strong commitment in each of these areas, the recycling process cannot succeed.

Recycling requires changes in behavior and habits of consumers, retailers, and manufacturers. Consumers choosing to recycle can start with their purchasing decisions, considering if a product is made from recycled material and if it can be recycled in their community. At the community level, retailers and other businesses can purchase recycled products for their own use and for sale. Manufacturers can invest in the equipment and processes needed to use postconsumer materials in manufacturing their products. All three levels—consumers, retailers/businesses, and manufacturers—can participate by sorting waste they generate to divert applicable materials for recycling.

Recycling in Montana

Several collection methods are currently in use in Montana:

Drop-off centers operate in many areas of the state. Separate bins for source-separated materials are placed at convenient locations for consumers to drop off their recyclables. Often, the collected materials will then be transported to a buy-back center.

Buy-back centers depend on consumers to deliver their recyclables; however, they are attractive options because they pay for some materials.

Community collection events require a great deal of volunteer effort and careful planning. Community residents store their recyclables until the collection event, when they bring them to a central location. Many Montana communities have regular community collection events for electronics and other recyclable materials.

Commercial collection programs target the large commercial sources of recyclables. These collections may generate larger volumes of separated materials for recycling than residential collections.

Curbside collection programs, often called "blue bag" programs, are the most convenient for consumers and produce the best results. They are also the most costly to maintain compared to the above options. There are few curbside programs operating in Montana

Many Montana communities combine two or more of these programs, finding that a hybrid program is the most effective solution to promoting recycling. They often work with private recycling companies that operate buy-back centers, as well as have a variety of other collection mechanisms. For example, in many communities, nonprofit groups or local recyclers operate drop-off bins, while some communities occasionally sponsor high-visibility collection drives. Several landfills and transfer stations offer recycling areas where recyclable waste can be separated by material.

Incentives

The Montana State Legislature has provided financial incentives to encourage the use of goods made from reclaimed materials and to discourage consumption of the same goods made from virgin materials. These incentives include:

- A tax credit to individuals and businesses for investments in property used for collection or processing of postconsumer materials, or for remanufacture from postconsumer materials (Title 15, Chapter 32, Part 6, MCA).
- A tax deduction for the purchase of recycled materials used by business and claimed as a business expense (Title 15, Chapter 32, Part 6, MCA).

- A tax credit of up to $500 for against air-quality permit fees Persons with beneficial interest in a business may receive a credit of up to $500 against the air quality permit fees for businesses using post-consumer glass (§ 75-2-225, MCA).
- A deduction for purchase of organic fertilizer produced in Montana (personal and business deduction). The deduction is in addition to all other deductions from adjusted gross individual income allowed in computing taxable income under (Title 15, chapter 30 or from gross corporate income allowed in computing net income under Title 15, chapter 31, part 1).

Rural Recycling

Rural recycling is a challenging but important issue for local and state government. Recycling programs must be developed with logistics of rural areas in mind.

These communities are striving to meet recycling and reduction goals; however, are hampered by their low populations and tax base; limited municipal and county budgets and personnel; low-density housing; and limited commercial development.

Communities trying to establish infrastructure to recycle do not generate enough recyclables to lure large recyclers to come and start businesses, nor do they produce enough recyclables to effectively start a full-scale recycling program of their own. Transportation costs to ship recyclables hundreds of miles to industries for processing is often cost-prohibitive and the value of the recyclables often aren't enough to pay for the gas to ship it to market.

To fill this gap, DEQ has promoted the "Hub and Spoke" concept to help rural communities overcome these barriers. In May 2011, DEQ provided a rural recycling workshop to bring community representatives together to find solutions to Montana's rural recycling challenges. The outcome was to work to build on the regional recycling approach.

A regional recycling approach helps to overcome the obstacles encountered by individual rural governments. Benefits to this type of approach include increased volumes of recyclables and increase marketing opportunities. Additional benefits include:

- Potential for cooperative marketing, which can substantially increase revenues,
- Conserved landfill capacity and avoided tipping fees,
- Regional economic stimulus from new collection and processing jobs, and
- Shared costs for equipment, personnel, processing, transportation, marketing, and facility capital and operating costs.

Environmental Issues

Recycling offers environmental benefits similar to source reduction and reuse. The impacts of recycling are much greater than just preserving landfill capacity. Recycling conserves energy

and natural resources; reduces air and water pollution; and reduces the amount of greenhouse gases, carbon dioxide, and methane generated.

Diversion of material from landfills also reduces the potential for toxic concentration of leachate introduced into groundwater systems. Landfill leachate requires costly treatment for ammonia, nitrates, oil, cyanide, phosphorus, or other hazardous materials. An assessment of the environmental impact of waste diversion must consider these long-term and future benefits when looking at the initial challenges and cost.

Using the National Recycling Coalition (NRC) Environmental Benefits Calculator, Montana achieved the following benefits through the diversion rate of 19.7% in 2010:

- Greenhouse gas was reduced by the equivalent of 227,470 passenger cars being removed from the roads,
- A total of 13 million BTUs of energy were conserved from avoidance of development of raw materials, and
- 197,643 trees were saved through the recycle of newspaper, mixed paper and office paper.

In addition, the following natural resources were saved:

Tons of Ferrous Steel Recycled	103,063
Pounds of iron ore saved per ton steel recycled	2,500
Pounds of coal saved per ton steel recycled	1,400
Pounds of limestone saved per ton steel recycled	120
Tons iron ore saved	128,829
Tons coal saved	72,144
Tons lime stone saved	6,184

The NRC calculations demonstrate that there are numerous ways to express resource savings through recycling. Recycling saves energy otherwise used to mine and process raw materials. As Montana recycling rates increase, the energy efficiencies become more evident. To learn more, see www.crra.com/nrcfiles/calculator/coverletter.html .

Additional information on yearly diversion rates and benefits for Montana can be found at www.recyclemt.gov .

Economic Issues

Recycling can help expand economic activity, provide new local market development and create jobs, as shown by the experience of states across the country. In Montana alone, recycling provides more than 300 jobs and revenues of more than $89 million (*Economic and Ecological Impacts of Recycling in Montana,* July 2004. Air, Energy, and Pollution Prevention, Montana Department of Environmental Quality).

Collection programs can be costly to develop and maintain. The demands for recycling are less visible than traditional waste management, and programs might not break even when those costs are considered as well. The development and sustainability of a recycling program depends on cost-effectiveness. Capital, operating, transportation, and external cost must be considered. Local governments and citizens alike must recognize that recycling may cost money and must be paid for as a public benefit like police protection, water treatment, and garbage collection and disposal.

All recycling options incur collection costs. However, curbside collection of source-separated recyclables is significantly higher than for mixed waste. Using the same collection vehicles on the same routes to collect mixed waste and recyclables on an alternating schedule can lessen the difference. Drop-off bins, buy-back centers, materials recycling facilities, and collection events are much cheaper for local governments, because residents do their own hauling. Studies on the costs of recycling vary widely, depending on the location and type of program. Decision-makers can only determine true costs by examining the unique factors at their specific site.

Recycling Website Resources

DEQ's website www.recyclmt.gov provides businesses with a list of recycled materials allowable as tax deductions. The website also provides information about types of materials that can be recycled in individual communities, under the "Where to Recycle." Additionally, yearly recycling statistics for Montana are listed. Individuals can also find information about what can be recycled in their area at www.earth911.com.

2012 Barriers (Draft) to Recycling

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. Long distances to markets and high costs of transportation make recycling of many commodities difficult in Montana, where low population density results in low volumes of recyclable materials.

2. There is a lack of local markets for recyclable materials, particularly for commodities that are heavy, difficult to consolidate, or low in value and therefore not cost-effective to ship long distances.

3. Landfills are convenient and still relatively inexpensive to use in Montana. The low cost of landfilling wastes makes it difficult for recycling to be an economic choice based only on the cost of disposal. Consumers and policymakers are often unaware of the full cost of waste management.

4. There is a lack of commitment by the public to fully support recycling in all its forms. Recycling can be more expensive than disposing of waste in a landfill. Yet, the public expects there to be an economic benefit from recycling. Products made from recycled materials sometimes cost more than from virgin materials, and consumers base many of their buying decisions on price.

5. There is a lack of funding for recycling programs, ranging from local funding for collection and processing equipment to funding for programs that assist public and private recycling efforts through collaboration, partnerships, and information.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Continue to advance the Hub & Spoke concept by helping Montana communities gain infrastructure and build sustainability for their recycling programs. Encourage collaboration and coordination of recycling efforts between local governments, private and public landfills.

2. Develop local markets for recyclable goods. Collaborate and form partnerships between private and public entities to create these local markets.

3. Provide economic incentives for recycling. Consider extending or making permanent the recycling tax credits and tax deduction.

4.4 COMPOSTING

Policy: Composting is the preferred method of managing organic materials in the waste stream.

Goals: Increase composting of residential and commercial wastes in Montana communities. Increase the use of compost by individual citizens, businesses, and governments

What Is Composting and Why this Goal?

Composting is the biological decomposition of organic matter into humus—the nutrient-rich organic matter that makes soil "rich." This process is on-going in nature as organic matter is exposed to air and moisture, and it can be accelerated by waste managers by controlling the mix of air, moisture, and temperature. Commonly composted materials are food, yard waste, wood waste, feedlot waste, treated sewage sludge, and paper products.

Composting is preferred to landfilling as a solid waste management method because it recycles organic wastes into a useful product. According to EPA figures, yard and food wastes make up 27% of the solid waste stream (EPA, 2010. *Municipal Solid Waste in The United States: 2010 Facts and Figures*). These organic materials break down fairly quickly as part of their natural life cycle when not entombed in a sanitary landfill.

The resulting compost is a valuable product that increases water retention, provides needed nutrients, and rejuvenates soil. The quality of the final compost determines its possible uses. High-quality compost can be used as an amendment for marginal soils or as a top dressing on lawns and golf courses, and is sought by nurseries, schools, farmers, landscapers, homeowners, and managers of various public works projects. Lower-quality compost can be used as daily cover for road and building construction, mine reclamation, and landfills. Landfill operators also can use compost as final cover to provide a cap, thereby helping to establish plants that will reduce percolation and erosion at closed facilities.

Composting can occur on a small scale in the backyard or in small- to large-scale municipal operations. All composting operations benefit from precomposting processes such as inspection, plastic bag removal, and grinding.

Municipalities, businesses and consumers should consider source reduction of organic wastes (leaving grass clippings on the lawn) and reuse (using organic wastes as mulches or bedding) in addition to composting.

Composting in Montana

Composting is part of 30 Municipal Waste Site (MWS) operations in Montana. The largest municipal compost operation is the West Yellowstone Composting Facility, which handles waste from Yellowstone National Park and the Town of West Yellowstone. Thirteen compost operations are located at municipal Class II landfills, eleven at Class III, and one at a Class IV landfill (see Section 4.5 for landfill class definitions). An additional four municipal programs are located at other sites. There are three commercial compost operations and two small licensed facilities that serve only the agricultural businesses at which they are located.

Composted waste typically diverts between 4% and 9% of Montana's total solid waste tonnage from landfills. The amounts can vary greatly depending on weather, availability of feedstock, and economic conditions.

The Montana Department of Transportation operates eleven animal mortality composting sites using the resulting compost at maintenance facilities to provide nutrients for onsite landscaping. Two NGOs began composting programs to manage food scraps that cannot be given to the public. School composting programs are increasing, at least partly due to an NGO's work to develop composting and gardening programs in schools.

Composting Methods

Turned windrows are elongated piles that are turned regularly to control moisture, temperature, and oxygen. Turning can be accomplished with a front-end loader or a specialized compost turner. The inside of the piles will reach 140 degrees F, even in below-freezing weather. The most common municipal composting design, this method will produce finished compost in 12 to24 months. Costs can be competitive with landfilling.

Aerated static piles are elongated piles over a network of perforated pipes. The pipes provide aeration, thereby eliminating the need to turn the piles. This composting method is commonly used in treating sewage sludge, food waste, and high volumes of fresh grass clippings, where aeration and temperature control are crucial. Aeration and carbon content can be increased by adding a bulking agent, such as wood chips, yard waste, shredded paper, or sawdust. Aerated static piles are a more expensive option than turned windrows, but they may be necessary for communities that wish to compost sludge, food. and yard waste.

In-vessel systems are totally enclosed, highly mechanized systems that produce compost very quickly, often in a few weeks. They are the most expensive option. The West Yellowstone Compost Facility is the largest in-vessel system currently used in Montana to handle municipal waste. Others include a small-scale system used by the University of Montana to manage food waste. A benefit for these applications is that the enclosed design eliminates the chance that animals will be attracted to food-composting operations.

Bioconversion is a relatively new process not currently in use in Montana. Anaerobic digestion is carried out in an enclosed tank to produce a liquid organic fertilizer, methane gas, and byproducts.

Home composting is gaining popularity across Montana. A backyard composting system can cost as much as several hundred dollars or as little as a few cents. Many companies market bins, barrels, and tumblers, each with an assortment of accessories.

Environmental Issues

Composting reduces the amount of waste going into landfills as well as problems associated with decomposition of organic waste. Organic materials, such as food and grass clippings, often are the primary source of moisture in the landfilled waste stream. Elimination of compostable waste can result in a reduction of leachate generation at landfills. Organic materials are also the source of methane gas, one of the primary air pollutants produced at landfills. Methane is produced in insignificant amounts during the aerobic composting process.

Composting also provides a valuable soil amendment with numerous uses that extend far beyond landscaping, including:

- Reforestation, wetlands restoration and habitat revitalization
- Erosion control and turf remediation
- Disease control for plants and animals
- Bioremediation of contaminated sites
- Remediation of soils contaminated by explosions

The primary problem associated with composting is the odor that can result from improperly run operations. Operators can control odor by pile management or air filtration. Odors are generally not a problem in low-technology operations involving only yard waste as long as piles are properly turned. Odors can result when grass clippings begin decomposing anaerobically (without adequate oxygen). Leachate, which may form when excess water is allowed to run through the composting material, can contaminate ground and surface waters.

Heavy metals contamination can be a problem when MSW is mixed with composted sludge, which results in compost products unsuitable for food-producing applications. Compost made with grass clippings from lawns treated with pesticides and herbicides generally can be used in gardens because the chemicals are destroyed during the composting process. There are, however, occasional alerts regarding an especially persistent herbicide or pesticide that is not destroyed during the composting process. In these cases, lawn clippings from treated areas are unsuitable feedstock for compost destined to gardens. Proper site selection, preparation, and operational practices will reduce the negative impacts associated with odors, metals, and leachate formation.

When sewage sludge, food waste, and other complex waste streams are composted, the potential for leachate production, heavy metal contamination, and public opposition increases. Animal wastes contain proteins, fats, and oils that are difficult to degrade, may attract pests, and may carry microbial pathogens. Such co-composting operations are carefully regulated by DEQ.

Economic Issues

There is a growing market for compost in Montana. Besides the traditional use of compost as a garden and yard soil amendment, it is routinely used now to retain water and help establish plants on steep roadways, as well as in the reclamation of environmentally damaged areas resulting from agriculture, mining, construction and natural causes.

Solid waste managers can save considerable money and landfill space by diverting more than 27% of the solid waste stream away from landfills through composting. Composting is an attractive method of increasing the life of landfills while also providing potential revenue from sales of finished compost. There is a strong potential for growth in compost operations in Montana.

2012 Barriers (Draft) to Composting

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. Low tipping fees and large landfills contribute to a lack of necessity for composting as a preferred management method over burial. Yard waste can be disposed of safely and cheaply at all landfills.

2. Large compost operations require monitoring and a steady supply of organic waste to operate effectively. Existing landfills may not wish to set aside the land area, nor dedicate the human resources needed to maintain an efficient composting system. Commercial composters must cover all operating expenses through sales and tipping fees. Commercial operations must typically keep tipping fees lower than surrounding landfills as an incentive to generate business. Municipal compost programs that do not charge citizens for the final product undermine private enterprises.

3. Backyard composters may become discouraged when they are unable to compost packaging materials described as "compostable" or "biodegradable." Small, backyard composting is ideal for yard waste and food scraps, but will not reach the necessary temperatures to effectively compost packaging.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Increase awareness and visibility of existing compost operations.

2. Encourage industry and business to save money by diverting organic waste to compost operations lower tipping fees.

3. Revise permit regulations and fee structures to accommodate midsized compost operations that handle food waste.

4. Encourage local composting operations to partner with Master Gardener and Backyard Composting programs in promoting composting and raising awareness about its benefits.

5. Encourage schools to divert food scraps for composting.

4.5 LANDFILLING

Policy: The State of Montana regulates all landfilling of solid waste in Montana and enforces laws to protect the public health and welfare of Montana citizens. Landfilling is a lower priority than source reduction, reuse, composting, and recycling as a method for solid waste management

Goals: All landfills will operate in a manner to protect public health and welfare and to protect the environment. When practical, material should be diverted from the waste stream to reduce both the volume of materials and the toxicity of materials entering landfills.

What Is Landfilling and Why this Goal?

Local and regional landfills continue to be the most common destination for municipal solid waste (MSW) in Montana. Although the amount of waste recycled and composted has increased over the past decade, Montana generated nearly 1.7 million tons of MSW in 2010. Based on the 2010 census population of 989,414 - on average every Montanan contributed 7.5 pounds to the state's landfills, recycled 1.47 pounds, and diverted 0.38 pounds of solid waste each day. During 2010, the reported amounts show that 80.3%of the solid waste generated in Montana was sent to landfills and 19.7%was either recycled or diverted from the landfill for another use.

Landfill operations have evolved from non-regulated open dumps into regulated sanitary entombments, complete with liners, leachate collection systems, and gas and groundwater monitoring wells. Modern landfills are well-engineered facilities that are located, designed, operated, monitored, closed, and maintained to ensure compliance with federal regulations as well as protect human health and the environment.

Montana and federal regulations include the following landfill standards:

- Location restrictions ensure that landfills are built in suitable geological areas away from faults, wetlands, flood plains, or other restricted areas.
- Liners are geo-membrane or plastic sheets reinforced with two feet of clay on the bottom and sides of landfills.
- Operating practices such as compacting and covering waste frequently with several inches of soil help reduce odor; control litter, insects, and rodents; and protect public health.
- Groundwater monitoring requires the installation of groundwater wells and regular sampling to determine if waste materials have escaped from the landfill.
- Closure and post-closure care includes covering landfills and providing long-term care.

- Corrective action plans ensure the control and clean-up landfill releases and achieves groundwater protection compliance.
- Financial assurance provides funding for environmental protection during and after landfill closure (i.e., closure and post-closure care).

Although current landfills do not pose the health and environmental hazards of their primitive predecessors, they require continued care and monitoring for many decades beyond closure.

Classification of Wastes

Solid wastes are grouped based on physical and chemical characteristics, which determine the degree of care required in handling and disposal, as well as the waste's potential for causing environmental degradation or public health hazards. Solid wastes in Montana are categorized into Group II, III, and IV and hazardous waste.

Group II Waste includes decomposable wastes and mixed solid wastes containing decomposable material, but excludes regulated hazardous wastes. Included in Group II wastes are:

- Municipal and household solid wastes such as garbage, paper, cardboard, glass, metal, plastics, yard waste, sewage treatment sludges, dead animals, offal, appliances, automobiles, and noninfectious medical facility waste; and
- Commercial and industrial solid wastes such as packaging materials, nonhazardous process wastes, crop residues, manure, and fertilizers

Group III Waste includes wood wastes and non water-soluble solids. These wastes are generally inert and have low potential for adverse environmental impact. Included in Group III wastes are:

- Unpainted brick, dirt, rock, and concrete;
- Untreated and unglued lumber;
- Vehicle tires; and
- Inert, nonhazardous, nonwater-soluble industrial mineral wastes.

Group IV Waste includes construction and demolition wastes and asphalt. Conditionally exempt, small-quantity generator hazardous waste (see Hazardous Waste section) that is generated as part of a construction or demolition project and that cannot practicably be removed from the waste can be deposited in a Group IV landfill. To keep the levels of hazardous waste to a minimum, all liquid paints, solvents, glues, resins, dyes, oils, pesticides, and other household waste must be removed from buildings before demolition.

Hazardous Waste Montana law defines "hazardous waste" as any waste material that is flammable, corrosive, reactive, or toxic, or that is listed as a RCRA hazardous waste (CFR Title 40, Subtitle C) ARM 17.55.501. Examples are gasoline, solvents, antifreeze, and caustic cleaning solutions. Individual households, farms, and ranches can dispose of small volumes of hazardous

waste in a Class II landfill; however, all Montanans are encouraged to dispose of hazardous waste through a collection/recycling center or a licensed hazardous-waste treatment, storage, or disposal facility. Any business that generates less than 220 pounds of hazardous waste per month is defined as "conditionally exempt" and can dispose of hazardous waste in a Class II landfill. However, a Class II landfill may refuse to accept such waste, and not all landfills will accept it. Any business generating more than 220 pounds per month must follow special procedures to store, ship, and dispose of hazardous waste.

Disposal facilities

Disposal facilities are classified according to their respective abilities to handle various types of solid waste. Although facilities are broadly classified according to the solid waste groups they may accept, specific restrictions may be placed by the DEQ on individual licenses.

- Class II landfills may accept Group II, III, or IV wastes, but not regulated hazardous wastes. Again exempted generators as well has conditionally exempt small quantity generators may place hazardous waste into a Class II landfill
- Class III landfills may accept only Group III wastes.
- Class IV landfills may accept Group III or IV wastes. Conditionally exempt, small-quantity generator hazardous waste that is generated as part of a construction or demolition projects may be accepted at Class IV landfills when it is not practical to remove it from the construction and demolition waste.

Disposal Facilities in Montana

Class II Landfills	**31**
Class III Landfills	**4 (Tire Mono Fills)**
Class IV Landfills	**4**

Landfill Capacity

As Montana continues to move forward in implementing waste reduction and a more integrated approach to solid waste management, it is obvious that landfills are and will continue to be an important part of the state's management of solid waste. As the population of Montana grows, the need for sufficient and properly operated waste disposal facilities also grows. Landfill capacity assurance is the process of planning for the future so that local governments and their citizens can be assured that they will have access to adequate solid waste disposal capacity.

Although Montana seems to have limitless space for landfills, the costs of siting, operating, and maintaining landfills are higher than ever before. These costs will continue to increase well into the future in order to monitor and control leachate from the landfills. Thirty-year monitoring

and care regulations make it clear that no landfill can ever be forgotten. Nationally, communities have burdened the cost of poorly sited, inadequately maintained, and improperly closed landfills. Montana has largely avoided such misfortune, but the mis-steps of others underline the importance of environmentally sound landfills. It is important to conserve space in properly sited and operated landfills.

Because of the difficulty of siting new landfills, it is increasingly important for citizens, local governments, and DEQ to work together to plan for future landfill needs. Everyone involved must be aware of trends in population growth, waste generation rates, new regulations, and other factors that influence the available landfill capacity in all regions of Montana.

Current landfill capacity

In 2011, there were 31 licensed Class II landfills in Montana, compared to 59 in 1993 and 87 in 1979. All 31 facilities must meet federal Subtitle D and Montana requirements for liner design, leachate collection, methane monitoring, and other criteria. Overall, the average remaining life of these facilities is about 37 years; however, because of the population growth occurring in Montana, landfill space is being filled at a higher rate than anticipated.

In 2010, the eight largest landfills accepted almost 79% of Montana's total landfilled MSW and the eleven largest 86% of the total. The other 18 landfills received an average less than 8000 tons of MSW in 2010.

Future Capacity Needs and Population

The Montana Department of Commerce Census and Economic Information Center projects a slow but steady population growth for the state throughout the next decade. The population is expected to continue to shift to the high-density centers in Gallatin, Yellowstone, and Lewis and Clark Counties and the four-county region of Flathead, Lake, Missoula, and Ravalli along the western slope of the Rocky Mountains. In 1990, these seven counties comprised less than 50% of Montana's population. By 2010 projections, they will comprise over 58%. Additionally, local governments must plan for rapid population growth – and therefore waste increase - in areas developed for oil and gas production.

Landfill Operator Training

Operational practices at MSW landfills can have a major impact on the environment and public health. Training of landfill operators improves landfilling practices and standardizes operations around the state. DEQ, using fees paid by landfills, has provided training through contract and in conjunction with the Montana Association of Counties, Montana State University Extension Service, and the Solid Waste Association of North America. As a result, 95% of all landfill operators in Montana are Manager of Landfill Operations (MOLO) certified by the Solid Waste Association of North America.

Environmental Issues

The environmental impacts of landfills depend primarily on what goes into them. Hazardous wastes from households and unregulated commercial sources, which comprise less than 1% of the waste stream, present the greatest risks to human health and the environment. Many factors affect the risks of landfills to human health and the environment. Among them are annual precipitation, proximity of human populations, sensitivity of environmental resources and the effectiveness of environmental control equipment.

As water moves through garbage, it picks up dissolved and finely suspended particles and forms what is called "leachate." The major environmental concern of landfills is the potential for leachate generation, migration, and subsequent contamination of ground water. There is evidence that leachate has migrated from some landfills in Montana and has affected ground water quality. Since greater than 50% of Montanans depend on ground water for their drinking water supply, potential contamination from landfill leachate is a concern. Federal landfill standards established landfill design requirements that minimize leachate generation and migration. The state has established regulations for the monitoring of regulated hazardous wastes and polychlorinated biphenyls (PCB) to prevent their disposal in municipal landfills.

In addition to leachate concerns, MSW landfills also have the potential to cause other environmental problems. For instance, they can produce explosive gases, such as methane. Furthermore; litter, dust, noise, and disease vectors can all be problems in improperly maintained landfills. Adequate enforcement and monitoring requirements and operational criteria should control these problems.

Economic Issues

Currently, land disposal fees in Montana are low compared to other parts of the country. To preserve valuable landfill space, local waste managers may consider new fee mechanisms and rate structures—such as a Pay-As-You-Throw program—which bases consumer costs on actual volume or weight of trash.

Increased health protection, in the form of environmental regulations, has caused a dramatic increase in the cost of construction and operation of landfills. In many cases, the public is unaware of the total costs of disposal. The costs of a new MSW landfill include capital and interest payments during development, operations, maintenance, collection, transportation, and financial assurance for pos-closure activities. Economies of scale can be achieved by building one large landfill rather than several small facilities.

2012 Barriers (Draft) to Landfilling

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. There is a public concern about landfills and the environmental damage that they can do. This is based on a history of environmental damage from poorly operated landfills that occurred before there was a clear understanding of the effects of landfills on air and water quality and public health, and prior to the strong regulations now in place.

2. Finding locations for new landfills is controversial and difficult. Citizens do not want a landfill in their backyards.

3. Operational costs have increased and transportation costs are high for regional landfills.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Keep and maintain current level of landfill management with a good design and site. Operate the landfills on provable, sustainable science. Use best management practices and stay up to date as those practices evolve.

2. Divert household hazardous waste from landfills. Evaluate and implement programs that will provide ways to minimize the amount of household cleaners, pesticides, paints, solvents, and similar materials that go into landfills. This may include education about alternative products, collection events, and other strategies to reduce and limit household hazardous wastes disposed in landfills.

3. Minimize the number of Class II landfills. The number of Class II landfills in Montana have dropped from 59 to 31.This number should remain fairly constant with continued efforts to manage them carefully. Prolonging their capacities, while protecting human health and the environment is preferable to building new landfills.

4. Consider the implementation of "Pay-As-You-Throw" programs to reduce the amount of materials going into landfills and create incentives for recycling and source reduction.

5. Consider an additional fee on solid waste to be used to fund recycling.

6. Provide public education on landfills including information on where garbage goes, operational practices and safety controls.

4.6 INCINERATION

Policy: The State of Montana shall regulate solid waste incineration and enforce regulations to protect the public health and welfare of Montana citizens. Source reduction, reuse, recycling, composting, and landfilling of waste materials are preferred alternatives to the incineration of solid waste.

Goal: Solid waste incinerators will be operated in a manner to protect the public health and welfare and to protect the environment. Material should be diverted from the waste stream to reduce both the volume of materials and the toxicity of materials that need to be incinerated. This will be done through source reduction, reuse, recycling and composting.

Note: As of June 2012, Montana has no MSW incinerators operating in the state

What Is Incineration and Why this Goal?

Incineration, with landfilling, is the lowest priority on Montana's waste management hierarchy. Incineration can reduce the volume and weight of waste, and potentially produce energy. However, it is a waste treatment method rather than a means of disposal. Although there is some potential to recover metals from incinerator ash, most of the 10% to 30% residue that remains after incineration must still be landfilled. Incineration does not include open burning.

Incinerators in Montana

Montana law provides three incinerator categories: Solid Waste Plain (which includes crematories and veterinary waste incinerators); Hazardous Waste; and Medical Waste (MCA 75-2-215).

There are 32 regulated incinerator facilities operating in Montana, including 27 crematories, one medical waste incinerator, used oil incinerators and two cement kilns (when using glass). Montana has no MSW incinerators in operation.

Environmental Issues

In 2000, EPA finalized new rules for commercial and industrial incinerators that burn nonhazardous solid waste. These incinerators had previously only been subject to state and local requirements. The 2000 federal regulations set emission limits for nine pollutants and opacity, based on stringent pollution controls known as Maximum Achievable Control Technology (MACT). The new regulations required existing incinerators to install wet scrubbers to meet the emission limits. Because of inability to meet emission limits of the new regulations, the only MSW incinerator in Montana (Livingston) closed in 2005.

As waste streams have become more complex, the health issues associated with incinerated waste have become paramount. Non-separated MSW may include materials containing polyvinyl chloride (PVC), polycyclic aromatic hydrocarbons (PAH), dioxins, and other carcinogenic organic compounds. Waste may also include mercury, lead, chromium, and other toxic heavy metals. All of these chemicals, as well as acid gases, may be released into the air during incineration.

Economic Issues

Due to the potential detrimental health effects caused by toxic air emissions, environmental standards for construction of incinerators are extensive and compliance is very expensive.

2012 Barriers (Draft) to Incineration

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. The public is concerned about air emissions from incinerators and potential health effects.

2. Incineration is a very expensive way to process solid waste before it is landfilled. It is expensive to build and expensive to manage.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. When considering MSW incineration, local governments should evaluate the technology carefully. Incineration is an option for reducing the volume of material needing to be landfilled and can offer a benefit in recovering energy from solid waste before it is disposed of as ash in a landfill. However, compliance with air quality emissions need to be studied and the best available science needs to be applied in the design and operation of an incinerator.

Chapter 5: SPECIAL WASTES

Several waste streams—because of their interest to Montana local governments and citizens, or their unique physical and/or chemical characteristics—present additional handling and management challenges and opportunities. By statute, the term "special waste" is defined as a solid waste that has unique handling, transportation, or disposal requirements to ensure protection of the public health, safety, and welfare and the environment. However, for this 2012 plan, the term is expanded to waste streams that are of special interest and/or emphasis at the time.

This chapter addresses the specific challenges and opportunities associated with the management and disposal of the most common of these "special wastes." Individual goals, barriers, and recommendations are made for each special waste included.

5.1 Hazardous Wastes/Universal Wastes

Due to the variety of entities and materials covered under Montana's hazardous waste rules, this subchapter has been further divided to better discuss MSW hazardous waste issues.

5.1.1 HAZWASTE BY CONDITIONALLY EXEMPT BUSINESSES
5.1.2 K-12 SCHOOLS INCLUDING LABORTORIES
5.1.3 HOUSEHOLD HASARDOUS WASTE
5.1.4 MERCURY CONTAINING EQUIPMENT AND DEVICES
5.1.5 AUTOMOTIVE WASTE INCLUDING USED OIL

5.1.1. Hazardous Waste by Conditionally Exempt Businesses

Policy: The State of Montana promotes recycling and proper disposal of hazardous waste by conditionally exempt businesses as the preferred method for this type of waste.

Goal: To work with conditionally exempt businesses to develop Best Management Practices for disposing of hazardous waste including the elimination of disposal in landfills and developing waste minimization strategies.

What Is Hazardous Waste by Conditionally Exempt Businesses and Why this Goal:

A waste is considered hazardous by DEQ and EPA if it has one or more of the following characteristics or if it appears on any list of hazardous wastes contained in 40 CFR 261.20 through 261.33.

1. Ignitable: A liquid with a flashpoint below 140°F.
2. Corrosive: A liquid with a pH less than or equal to 2.0 or greater than or equal to 12.5. Also, a liquid that dissolves steel at an established rate.
3. Reactive: It is unstable or undergoes rapid or violent chemical reaction with water or other substances (waste bleaches and other oxidizers).
4. Toxic: It contains high concentrations of heavy metals (lead, cadmium, mercury, etc.), specific pesticides, or selected volatile organic compounds that could be released into the environment.

"Acutely hazardous" wastes are those that DEQ and EPA have determined to be so dangerous in small amounts that they warrant more stringent regulation. Certain pesticides fall into this category.

The Montana Hazardous Waste Rules, which adopt federal RCRA regulations, classify generators of hazardous waste according to the total amount of hazardous waste they generate in a calendar month, measured in pounds. **Conditionally exempt businesses (CEBs), or conditionally exempt small quantity generators, are businesses that generate no more than 220 pounds (100kg) of hazardous waste in any month and no more than 2.2 pounds (1kg) of acutely hazardous waste in any month and can dispose of hazardous waste in a Class II landfill.** (For comparison, 30 gallons of liquid hazardous waste with a density similar to water will weigh 220 pounds.)

Hazardous Waste Management

The handling, transportation, storage, and disposal of hazardous waste is regulated by stringent federal law and state law and rules. Hazardous waste must be sent to a treatment, storage, and disposal facility that is designed and permitted to accept hazardous wastes. There are no such facilities in Montana open to the public; therefore, all hazardous waste generated in Montana by large and small generators must be shipped out of state.

CEBs can dispose of hazardous waste in municipal Class II landfills if the landfill will accept it. Hazardous waste containers must be marked "hazardous waste" and must have the accumulation start date annotated on the label.

Environmental Issues

Waste from CEBs can cause fires, explosions, and the release of toxic fumes. Use of hazardous products is associated with toxic health effects and environmental degradation. These risks can be significantly reduced through proper use, storage, and disposal techniques.

Economic Issues

The collection, storage, transportation, and disposal of hazardous waste can be costly to waste management. Although the selection of nonhazardous products might prove to be an expensive alternative to commonly available chemicals, the ease of disposal may offset the higher initial cost. As more companies are demanding nonhazardous product options, green alternatives are becoming more accessible and economical.

2012 Barriers (Draft) to improved Hazardous Waste Handling

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. Current collection opportunities are infrequent and limited. They are usually help only once a year.

2. Cost of collecting, holding, and transporting hazardous waste is high.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Educate businesses about what comprises hazardous waste and their options for disposal. Small businesses are often unaware that common products are hazardous and should be disposed of in a particular manner.

2. Work to help business and local governments to offset cost for collections of hazardous waste.

5.1.2. Hazardous Waste/Universal Waste
K-12 Schools – Laboratory Wastes

Policy: The State of Montana promotes the proper disposal of unwanted laboratory chemicals to be protective of public health and the environment.

Goal: All chemical waste and unwanted chemical inventory generated by Montana K-12 schools are disposed of and/or recycled in an environmentally responsible manner.

What Are K-12 Laboratory Wastes and Why this Goal?

In August 2004, Montana DEQ sent a survey to more than 400 K-12 schools in Montana requesting information on chemicals in storage for use in science lab courses. Because mismanagement and improper storage of hazardous chemicals in school labs had become a nationwide safety issue, DEQ wanted to determine what types of chemicals were in Montana schools and if these chemicals were potentially dangerous. More than 37% of the schools surveyed responded, reporting a total of 570 different chemicals including chemicals with explosion, poison, and radioactive characteristics.

Because many of the schools indicated that their chemical inventory was no longer relevant or needed for class work, it quickly became apparent that schools needed information and assistance with proper disposal and/or recycling of unwanted chemicals.

Regulation

Montana K-12 schools are regulated by the same hazardous waste/universal waste laws applicable to Montana businesses, detailed in the introduction of this chapter.

Laboratory Waste Handling in Montana K-12 Schools

In response to the 2004 survey, DEQ worked with individual schools as well as school associations to develop a myriad of "green school" programs, in which proper handling of laboratory waste was emphasized. DEQ also provided nine "Montana School Laboratory Safety Training" events across the state. Furthermore, in 2005, DEQ was awarded an EPA grant of $60,000 for partial reimbursement to schools for chemical disposal costs. Schools receiving reimbursement funding through this EPA grant included Broadus, Polson, Absarokee, Hardin, Harlem, Missoula, Frenchtown, Townsend, Laurel, Glasgow, and Havre.

DEQ continues to work with K-12 schools on "greening" programs. Although cleanout reimbursement money from the EPA grant has been spent out, DEQ still provides guidance and assistance to schools on chemical management and cleanout of unwanted inventory.

Environmental Issues

Because administrators of K-12 schools are often not knowledgeable of the regulatory requirements for disposal of hazardous and universal waste, concerns of perceived difficulty and excessive cost are prevalent. Some schools have chosen to keep unwanted chemicals in the storage closet rather than dispose of them properly. Worse yet are schools that choose to dump chemicals down the drain, where they affect downstream treatment systems, or place chemicals in the trash, where they may react with other landfill waste. Proper cleanout of K-12 laboratory chemicals prevents downstream reactions. Most importantly, however, school environments for Montana's children become safer and less toxic as schools eliminate excessive chemical inventory.

Economic Issues

As K-12 schools strive to develop and implement effective chemical management programs, administrators must plan for both the initial and ongoing scheduling of disposal of unwanted chemicals. Costs for initial cleanout of excess/unwanted chemical inventory generally run between $5,000 and $10,000. After initial cleanout, schools can keep their costs for ongoing chemical management low by only purchasing limited amounts of necessary chemicals.

Barriers (Draft) to Proper Disposal of Laboratory Chemicals in MT K-12 Schools

(Barriers will be finalized through advisory committee process)

1. Lack of knowledge of regulations and risks associated with unwanted/unnecessary chemical inventories.

2. Cost of proper disposal of unwanted/unnecessary chemical inventories.

2013 Recommendations (Draft)

(Recommendations will be finalized through advisory committee process)

1. Educate school administrators and affected teachers as to the environmental and safety hazards associated with stockpiling of laboratory chemicals.

2. Continue to search for funding assistance to help defray costs of proper disposal of K-12 laboratory wastes.

5.1.3. Household Hazardous Waste (HHW)

Policy: The State of Montana shall promote an integrated approach to the management of hazardous wastes from households and assist with developing alternatives to landfilling of these wastes

Goal: Reduce household hazardous waste (HHW) generation through source reduction. Ensure that HHW is disposed of in a manner protective of human health and the environment.

What Is Household Hazardous Waste and Why this Goal?

Many products found in the kitchen, bathroom, garage, or garden shed are potentially hazardous substances. For example, motor oil, paints, pesticides, antifreeze, wood preservatives, batteries, and some household cleaners contain solvents, petroleum products, heavy metals, or other chemicals. Because of their chemical nature, they can poison, corrode, explode, or burst into flame when handled improperly. Should these products be disposed with other household trash in landfills or poured down the drain, their hazardous chemicals may injure people or contaminate drinking water sources; thus, they are considered household hazardous waste (HHW).

HHW in any amount is exempt from hazardous waste regulation because it is generated by households, even though the constituents of that waste might be identical to hazardous wastes generated by industry. The small amounts generated by households can be legally disposed of in a MSW landfill.

Because DEQ recognizes HHW as potentially posing serious environmental and health risks; emphasis on avoidance and/or proper disposal of HHW waste management is essential. Community-sponsored collection events are an excellent alternative to depositing these materials in the landfill; unfortunately, most Montana cities and counties cannot absorb the costs associated with them.

Environmental Issues

Household products contain many of the same toxic chemicals used in industry, small businesses, and agriculture. While consumer products often come in smaller sizes or contain lower concentrations of hazardous ingredients, the shelves of grocery and hardware stores contain a wide variety of hazardous products, including some with high concentrations of hazardous ingredients. For example, certain drain-cleansing products are 100% sodium hydroxide, and mothballs are 100% naphthalene. These products exhibit all of the properties of industrial hazardous waste and need to be handled with extreme care during use, storage, and disposal to avoid potentially serious health or environmental damage.

Poured down storm sewers, wastes can flow into rivers and aquifers, and enter the food chain. In landfills, they commingle with other waste and have the potential to produce leachate. Numerous alternatives to hazardous cleaning, maintenance, and personal products are currently available. The thoughtful selection of products, based on health and environmental characteristics, would do much to reduce the amount of HHW generated.

Economic Issues

HHW can be costly to dispose of due to associated factors such as transportation, collection, and storage costs. The decision to purchase more expensive alternative products rather than commonly available chemicals could end up offsetting the cost of disposing of hazardous products.

2012 Barriers (Draft) to improved HHW Handling

(Listed below are draft Barriers for consideration – final Barriers will be determined through advisory committee process)

1. There are a limited number of facilities in Montana that accept waste on a regular schedule.

2. Community collection events are generally a once a year event and are expensive to sponsor.

3. Consumers do not understand the toxicity of many of the products available for their use at home, nor do they know their options for safe handling and disposal.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration – final Recommendations will be determined through advisory committee process)

1. Educate the public about hazardous waste in home-use products and options for product substitution.

2. Consider dedicating a portion of the solid waste fees to help landfills or transfer facilities provide permanent HHW collection sites for communities.

5.1.4. Mercury-Containing Equipment

Policy: The State of Montana promotes proper disposal of waste or unwanted mercury containing equipment to be protective of public health and the environment.

Goal: All mercury containing equipment and devices will be disposed of and/or recycled in an environmentally responsible manner.

What Contains Mercury and Why this Goal?

EPA has successfully worked with manufacturers to eliminate mercury from their processes, but mercury was once an important ingredient in household and industrial applications. As a result, many mercury-containing products are still in service. Mercury can be found in pressure regulators, thermometers, thermostats, switches, appliances, clothes irons, electronics, light bulbs, and other common items.

The vast majority of products contain only small amounts of mercury; however, the sheer volume of mercury-containing products that enter the waste stream raises concern about the potential pollution of natural resources. Small amounts of mercury can contaminate air, land, and water. Source reduction and recycling are important management strategies for reducing risks to environmental quality and public health.

Recycling of Mercury-Containing Equipment in Montana

Thermostats. Montana passed the Mercury-Added Thermostat Collection Act in 2009 (MCA 75-10-15). This law requires manufacturers to offer a take-back program within the state and mandates that wholesalers in Montana accept mercury-containing thermostats for recycling. Since its passage, the Thermostat Recycling Corp. (TRC) has increased its outreach effort to Montana wholesalers, inviting them to participate in its mercury-containing thermostat collection program for a one-time fee of $25. TRC is a nonprofit financed by Honeywell, White-Rodgers, and General Electric, which all manufacturer thermostats.

The law also encourages local government to participate in the program and offer thermostat recycling at municipal landfills. TRC has limited collection points in Montana, which can be found at www.thermostat-recycle.org.

Vehicle switches. Mercury-containing switches were used in many vehicles manufactured before 2003. Given that vehicles are the most recycled item in America, recovering the mercury-containing switches before the vehicles are melted down to make new steel significantly reduces mercury emissions resulting from that process. To that end, EPA established NVMSRP in 2006 in collaboration with industry, environmental groups, auto dismantlers, and state officials. The program's goal is to reduce up to 75 tons of mercury emissions from steel electric-arc furnaces (EAF) by 2017, which is when EPA expects that the majority of vehicles with mercury-containing switches will no longer be in service by then. To support NVMSRP, the automotive industry established the End of Life Vehicle Solutions Corp.

(ELVS), which assists program participants in implementing the switch recovery program. ELVS initially offered financial incentives for participants as well, but those funds are no longer available.

CFLs. Few community recycling opportunities for compact fluorescent lights (CFLs) exist in Montana, although the issue is getting more attention nationally and more companies are offering take-back programs. In Montana and elsewhere, high energy costs are driving consumer and business interest in CFLs, which are highly energy efficient. CFLs save about $30 in electricity costs over the lifetime of the bulb and last ten times longer than incandescent bulbs. Montana utility companies, along with state and local governments and private businesses, are working together to increase awareness and acceptance of CFLs.

Environmental Issues

Mercury cannot be created or destroyed; it occurs naturally in air, water, and soil in several forms: elemental (metallic) mercury, inorganic mercury compounds, and organic mercury compounds. Mercury can affect the human nervous system and harm the brain, heart, kidneys, lungs, and immune system.

The most common source of human exposure to mercury is consumption of fish or shellfish. Many states have issued advisories for many of their lakes to educate the public and reduce consumption of mecury-contaminated fish. Montana Fish, Wildlife and Parks partners with the Department of Public Health and Human Services to produce a fish-consumption guide for Montana anglers and families.

Economic Issues

EPA continues to develop stringent regulations limiting the use of mercury in consumer products. It is unclear how the financial costs of managing mercury in compliance with federal regulations will be addressed by industry and government stakeholders. EPA also works with industry to develop voluntary and mandated take-back programs for some mercury-containing equipment. Over the long term, EPA predicts that mercury will eventually have little value as a commodity due to the success of global efforts to successfully decrease industrial use ("Managing Commodity Grade Mercury Supplies," www.epa.gov/mercury/pdfs).

2012 Barriers (Draft) to Proper Management of Mercury Waste

(Listed below are draft Barriers for consideration;
final Barriers will be determined through advisory committee process)

1. Consumers are not aware of existing take-back programs for mercury-containing equipment.

2. Wholesalers, contractors, retailers, solid waste managers, and others may resist TRC's $25 one-time fee to participate in the thermostat-recycling program.

3. Retailers that sell used building scrap may still accept and sell mercury-containing thermostats to home renovators.

4. Junk vehicle crushers may choose to not participate in removing mercury-containing components from scrap vehicles.

5. Few facilities take back CFLs.

6. Consumers and businesses lack awareness about the benefits of recycling CFLs.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration; final Recommendations will be determined through advisory committee process)

1. Improve infrastructure for spent CFL collection and transportation, working with local retailers and suppliers.

2. Educate the public about the importance of, and opportunities for, proper CFL disposal.

5.1.5 Automotive Shop Wastes including Used Oil

Policy: The recycling and disposal automotive related waste will be conducted in a manner that is protective of human health and the environment.

Goal: Automotive shops and "do-it-yourself" mechanics will implement best management strategies to reduce waste generation and ensure proper disposal of waste when necessary.

What Is Automotive Shop Waste and Why this Goal?

Automotive shops generate several kinds of waste including waste solvents and coatings; contaminated rags, wipes, and absorbents; empty chemical containers; used oil; waste antifreeze; sanding or grinding dusts; and contaminated wash waters. Some wastes clearly must be managed as hazardous, while others may require the owner or operator to make that determination.

Because automotive shop waste may be determined to be hazardous, operators are encouraged to procure nonhazardous chemicals when available, reuse/recycle fluids and rags when possible, and when necessary, properly disposal of waste products.

Environmental Issues

Almost all automotive shops generate some type hazardous waste. However, due to demand from the repair industry, many vendors and suppliers now offer nonhazardous alternatives for the products they sell. Reputable shops ensure that their wastes are handled correctly and take measures to ensure that fluids to not enter soils or ground water.

Economic Issues

A shop can save money by reducing labor and waste disposal costs through implementation of best environmental practices. For example, using a spray cabinet can reduce shop labor by 75%, saving time otherwise spent cleaning for other tasks. Additionally, paying more upfront for an aqueous-based solution will deliver long-term savings. Generally, aqueous solutions last longer and don't need to be changed out as frequently as traditional solvents. Some aqueous-based brake washing or microbial-based solutions can last for two to three years before they must be changed out. The lifespan of the solvent can be extended by oil skimming and filtration.

2012 Barriers (Draft) to Proper Recycling and Disposal of Automotive Wastes

(Listed below are draft barriers for consideration. Final barriers will be determined through advisory committee process.)

1. Automotive staff sometimes don't know that environmentally preferable products are available.

2. Automotive staff may not be comfortable using unknown products.

3. Uncertainty of the durability of recycled products plays into the nonuse of recycled oils and other shop fluids.

2012 Recommendations (Draft)

(Listed below are draft recommendations for consideration. Final recommendations will be determined through advisory committee process.)

1. Promote the use of aqueous-based solvents. These water-based solutions can be composed of detergents, alkaline chemicals, microbes, or any combination thereof.

2. Promote the use of re-refined oils and oil recycling programs.

5.2 Medical Waste

Policy: The State of Montana promotes proper disposal of infectious waste to be protective of public health and the environment.

Goal: All infectious waste generated by hospitals, doctor offices, dental offices, veterinary clinics, and households is disposed of properly.

What Is Medical Waste and Why This Goal?

Medical, or infectious waste, is any waste capable of transmitting a disease to humans. It includes the blood-soaked wastes from patients with infectious diseases, certain laboratory wastes, and healthcare items designed to cut or puncture. Examples include bandages, lancets, syringes, microbiological cultures, blood and tissue specimens, and personal care items. Most medical or infectious waste is generated in hospitals; however, it may be generated in numerous other settings, including clinics, dental offices, veterinary offices, nursing homes, laboratories, and private homes.

The probability of spreading disease to the public through contact with infectious waste is quite low, although it can happen. Occurrence would require that the infective agent be present in sufficient strength and numbers to cause infection, that the infective agent have access to the human body, and that the human be susceptible to the infective agent. The public may perceive the risk to be much greater than it is.

Waste transporters and landfill operators are at much greater risk of acquiring an infectious disease than are members of the general public, because the potential for their exposure to infectious waste is much greater. Without proper containerization and labeling of infectious wastes, these workers may be injured by sharp instruments or infected by exposure to infectious wastes.

Regulation

In 1991, the Montana legislature passed the Infectious Waste Management Act to set standards for the storage, transportation, treatment, and disposal of infectious waste. The Act requires that generators separate infectious waste from regular waste at the point of origin and that it be stored in specially marked containers in a secured area until it is rendered noninfectious.

Sharp waste, such as hypodermic needles, must be placed in rigid "Sharps" containers. Infectious waste that has been treated and rendered noninfectious by incineration, steam sterilization, or chemical sterilization may be disposed of in a Class II municipal solid waste landfill. The Infectious Waste Management Act requires the state licensing board of any profession or facility that generates infectious waste to ensure compliance with the provisions of the Act.

Infectious Waste Handling In Montana

Waste managers may treat and dispose of infectious waste through "incineration with complete combustion that reduces infectious waste to carbonized or mineralized ash" (§ 75-10-1005, MCA). Two medical waste incinerators operate in Montana. DEQ regulates both air emissions from the incinerators and solid waste aspects of the facilities. These incinerators treat wastes from their own facilities. One commercial autoclave treats infectious waste from Montana and surrounding states. In 2008, this facility collected and treated 1,611.77 tons of infectious waste. After being autoclaved at 238 degrees and 46 PSI for 44 minutes, the now noninfectious waste is transported to a landfill where it is placed in a specially designated area for disposal. It is immediately covered. All medical waste containers are cleaned at the company's warehouse/processing facility by heat and chemical sterilization. They are then stored and distributed for reuse by customers.

Environmental Issues

When burned, hospital waste and medical/infectious waste can emit various air pollutants, including hydrochloric acid, dioxin/furan, and the toxic metals lead, cadmium, and mercury. However, 85% to 90% of hospital waste is not infectious. Perhaps the greatest environmental impact medical facilities have on the waste stream is the large volume of waste they generate. These facilities commonly use disposable items, some of which may be necessary to control infection. Nonetheless, medical facilities should examine the opportunities for source reduction, reuse, and recycling of all their waste streams.

Economic Issues

Following the adoption of stricter air emission regulation, all but two medical incinerators in Montana have ceased operation. These incinerators handle only their own waste. Two other medical facilities autoclave and landfill their own waste. The remainder of medical waste generated in Montana is stored and transported to the one commercial autoclave, which is located in Butte.

Barriers (draft) Proper Disposal of Infectious Waste

(Barriers will be finalized through advisory committee process)

1. Lack of cost-effective sterilization options for small clinics may result in more waste being disposed of than is necessary.

2. Lack of information for small household generators.

Recommendations (Draft)

(Recommendations will be finalized through advisory committee process)

1. Educate small dental, medical. and veterinary generators of infectious wastes about the proper disposal of these wastes.

2. Educate households about the proper disposal of infectious wastes.

5.3 Clandestine Methamphetamine Labs

Policy: The State of Montana promotes the proper disposal of waste resulting from the bust or discovery of a clandestine methamphetamine lab to be protective of public health and the environment.

Goal: All residual methamphetamine lab waste resulting from the bust or discovery of a clandestine methamphetamine lab is disposed of properly.

What Is a Clandestine Methamphetamine Lab Waste and Why this Goal?

From 2000 to 2005, Montana saw a substantial increase in the local production of methamphetamine by small, but dangerous, clandestine labs. These labs could be assembled in apartments, hotel rooms, cars, camper trailers, abandoned buildings, and outdoors. The waste these labs generated posed significant risk to public health and the environment. For every pound of meth produced, the process generated five to eight pounds of highly hazardous waste.

To address the waste products resulting from clandestine methamphetamine labs, the 2005 legislature enacted an indoor property decontamination standard (§ 75-10-1301 through 1306, MCA) delegating authority to administer the standards to DEQ. DEQ then promulgated rules to enact the statute (ARM17.74.507), and the Montana Meth Cleanup Program (MCP) became a program within the Hazardous Waste Section of DEQ.

Regulation and Discussion

MCP administers Methamphetamine Contamination-Indoor Property Decontamination Standards (2005), which require establishment of decontamination standards and procedures for the cleanup of indoor/habitable property contaminated by the illegal manufacture of meth. MCP posts known meth labs on this website, as reported to it by the Montana Department of Justice (DOJ), and works with property owners, contractors, and local health officials to remediate the labs. Additionally, MCP approves the training and certification of contractors and their employees to conduct meth lab assessment and remediation activities in accordance with ARM 17.74.507, as well as reviews assessment and remediation reports to determine if cleanup standards have been met and if the property can be removed from this website.

DOJ reported 401 methamphetamine lab busts for the period between January 1, 2001, and December 31, 2007. As of June 26, 2012, there were 214 properties listed on DEQ's Meth Contaminated Property List, and 75 property owners had received a Certificate of Fitness from MCP and had their addresses removed from the website.

The number of known labs in Montana peaked in 2002 at 122 labs and has been steadily dropping since. Although lab busts per year are declining, DEQ is finding that the information needed to effectuate cleanup on the backlog is difficult to obtain. Also, DEQ is discovering that there are many clandestine drug labs throughout the state that were never reported to or investigated by law enforcement. Restoration of inhabitable properties impacted by meth is critical to protect present and future occupants of these structures.

Although cleanup of meth contaminated properties is not required by statute, a property owner wanting to conduct an approved cleanup must use a DEQ-certified contractor and meet cleanup standards to have their property removed from the web list and enjoy the immunity provision in the statute.

The regulated community under MCP consists of anyone seeking to become a Certified Meth Lab Cleanup Contractor. DEQ also oversees the certified contractor's performance by determining if the contractor's work has effectively met the cleanup standard. In addition, DEQ regulates the training providers responsible for the courses to certify cleanup contractors. During the first renewal period, approximately 50% of the initially certified contractors attended a meth lab cleanup refresher course and have been recertified for another two-year period.

Environmental Issues

For every pound of meth produced, the "cook" process generates five to eight pounds of highly hazardous waste. Following a lab bust, the hazardous materials/waste are handled according to regulatory requirements. Unfortunately, contaminated materials such as carpets, drywall, furniture, and bedding are left in the building. Although these materials are not considered hazardous by definition, they still pose a health threat to future occupants.

Economic Issues

The cost of removing the contaminants from clandestine lab sites has increased substantially over the past few years. The costs to property owners to render these sites habitable also continue to rise.

Barriers (Draft) to Proper Disposal of Meth Lab Waste

(Barriers will be finalized through advisory committee process)

1. Lack of communication link with responding agencies.
2. Cost of additional "handling" requirements.
3. Lack of knowledge on meth lab wastes.

2012 Recommendations (Draft)

(Recommendations will be finalized through advisory committee process)

1. Develop outreach materials to educate property owners and law enforcement personnel on cleanup procedures and standards.

2. Enact new legislation to expand the scope of the program. During the 2009 legislature, a bill was introduced, but did not pass, to expand the scope of meth cleanup program regulatory authority to address methamphetamine exposure beyond processing at drug labs to include use and presence of meth at inhabitable properties. The bill prohibited habitation of contaminated property reported by law enforcement until the property owner/agent demonstrates the property met the current Montana cleanup standard; created administrative and civil enforcement authority for DEQ; allowed assessment and collection of penalties; and provided the opportunity for appeal and Board of Environmental Review (BER) hearing of the appeal. Finally, the bill proposed creating a methamphetamine contamination cleanup account for the deposit of penalties collected for violating provisions of the 2005 Act.

5. 4 Waste Tires

Policy: The State of Montana promotes proper disposal of waste tires to be protective to public health and the environment, and works with local governments to develop beneficial reuse option for waste tires.

Goal: Increase the number of tires that are reused or recycled, thereby decreasing the number of tires that are landfilled, stockpiled, or disposed of improperly.

What are Waste Tires and Why this Goal?

The United States generates approximately 300 million waste tires per year. Although tire disposal is not tracked, EPA estimates the rate at one tire per person per year. Montana tire dealers estimate a replacement rate of 0.75 tires per person per year. Even using conservative estimates; Montana generates approximately 727,500 waste tires per year.

Diverting tires from the waste stream through recycling efforts has become big business. Scrap tires are used whole as well as chipped, shredded, and ground. Productive and environmentally safe applications range from tire-derived fuel (TDF) to playground cover, landscaping mulch, and asphalt additives. Retreading also saves millions of scrap tires from being disposed of as scrap each year. From 1990 through 2003, the number of waste tires recycled increased from 11 million (24.5% of the 223 million generated) to 233 million (80.4% of 290 million generated).

Environmental Issues

Piles of waste tires pose health threats. Disease-carrying pests such as rodents may live in and among the tires, while mosquitoes will breed in the stagnant water that collects inside them. Several varieties of mosquitoes can carry deadly diseases, including encephalitis and dengue fever. Short of removing the piles, mosquito control and eradication programs are difficult.

Burning waste tires also poses a risk to human health. Chemical composition tests on waste rubber show that it contains numerous toxic and hazardous pollutants. Although combustion of tires for energy recovery provides an inexpensive energy source, uncontrolled combustion of waste tires releases these hazardous pollutants into the air. The properties that make tires suitable for energy recovery combustion also make them susceptible to unwanted and uncontrolled combustion. Open, uncontrolled tire fires are difficult to extinguish and can release large amounts of toxins into the air, soil, and ground water.

Tires occupy a large space in landfills. They are not easily compressed and nearly 75% of the space occupied by a whole waste tire is dead space, or air.

Economic Issues

Although the recycling/reuse of waste tires is a business opportunity that is in the development stages, the costs associated are generally too onerous for a company without some type of subsidy. For any business interested in starting a waste tire reuse/recycle program, the following issues must be evaluated.

- The number of waste tires available within a 200 mile radius.
- The types of tires available—passenger tires, light truck, or both.
- The amount that can be charged to collect the tires.
- Potential customers for the recycled material.
- The ultimate end-market—such as TDF, landscaping material, playground cover, or engineering grade powders.

Typically, startups will need access to about 500,000 tires per year for a successful business model. Anything less than this will not justify the initial capital investment required.

2012 Barriers (Draft) to Reuse/Recycling of Waste Tires

(Listed below are draft Barriers for consideration; final Barriers will be determined through advisory committee process)

1. Montana generates less than one million waste tires annually over a large geographic area. This inhibits the economic feasibility of many waste tire management options.

2. The cost of equipment is barrier to recycling tires. The average cost of a tire shredder is over $500,000, putting it beyond the reach of most Montana communities.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration; final Recommendations will be determined through advisory committee process)

1. Work with local governments to adopt a road specification that would allow a certain percentage of asphalt to be composed of waste tires.

2. Work with manufacturers collect used tires and develop take back programs.

5.5 White Goods

Policy: The State of Montana shall encourage the recycling of all appliances after removal of parts detrimental to the environment.

Goal: Increase the amount of white goods diverted from the waste stream for reuse and recycling in all communities in Montana.

What Are White Goods and Why this Goal?

"White goods" applies to a category of large domestic appliances including refrigerators, washing machines, and dishwashers. When recycled, these appliances are part of the ferrous scrap stream.

In recent years, recycling of white goods has been driven by consumer desire for the latest trend in appliances and the public's awareness of the hazards of chlorofluorocarbons (CFCs).

All Montana landfills accept white goods for recycling. Montana consumers also can participate in retail recycling programs. For instance, Lowe's takes part in the Call2Recycle program (www.call2recycle.org); with the purchase of a new appliance, Lowe's will recycle the old appliance at no cost. In addition, Sears, and 22 other companies nationwide, partner with EPA to recycle freezers and refrigerators through the Responsible Appliance Disposal Program (www.epa.gov/Ozone/partnerships/rad).

In 2010, DEQ offered a rebate program to encourage Montana citizens to exchange their old appliances for Energy Star models. To receive the rebate, consumers had to recycle their old appliances.

Environmental Issues

The Federal Clean Air Act prohibits the release of CFCs into the atmosphere, requires the recycling of refrigerants, and bans certain nonessential uses. CFCs are a chemical coolant composed of carbon, fluorine, chlorine, and hydrogen. Due to public and industry environmental concerns, CFCs were replaced with HCFCs (hydrochloroflurocarbons).

In Montana, before an appliance can be accepted for recycling or disposal, a certificate stating that all refrigerant has been removed is required. In some cases, these sites have licensed employees who can remove the refrigerant for a fee.

Economic Issues

Transportation can be an issue in recycling white goods, sometimes costing more than the material is worth. In addition, metal market fluctuations may make collecting and preparing the appliances for recycling cost prohibitive. In these cases, communities can look for local reuse and refurbishing opportunities to keep white goods out of the landfills, including donation programs through social services.

2012 Barriers (Draft) to Recycling White Goods

(Listed below are draft Barriers for consideration;
final Barriers will be determined through advisory committee process)

1. Markets are driven by the price of metal. Recycling that is cost effective one month may be less so the next month.

2. Recyclers must have a large amount of storage to hold the white goods.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration;
final Recommendations will be determined through advisory committee process)

1. Educate consumers on the benefits of re-using (donating) unwanted appliances rather than sending them to landfill. When disposal is the only option, provide consumers with information on where waste appliance can be recycled.

5.6 Construction and Demolition Waste

Policy: The disposal of construction and demolition waste shall be reduced and/or eliminated through resource and energy-efficient construction practices.

Goal: Reduce the amount of construction and demolition waste going into Montana landfills by developing reuse and recycling options for materials.

What Is Construction and Demolition Waste and Why this Goal?

Construction and demolition (C&D) debris consists of the waste generated during construction, renovation, and demolition projects. C&D waste often contains bulky, heavy materials, including concrete, wood, asphalt, gypsum, metal, brick, and plastic, as well as salvaged building components such as doors, windows, and plumbing fixtures. The vast majority of C&D waste (approximately 92%) comes from building demolition and renovation, with the remainder generated by new construction. EPA estimates that the commercial and residential building sectors produce 61% and 39% of C&D waste, respectively. (www.epa.gov/epaoswer/non-hw/debris/about.htm).

Large quantities of materials are generated by building demolition. The entire weight of a building, including the concrete foundations, driveways, patios, and so on, may become C&D debris. On a per building basis, quantities of demolition waste are often 20 to 30 times as much as C&D waste generated during construction.

The estimated C&D debris generated during demolition of a single-family house is 111 pounds per square foot of dwelling. While the majority of debris from new construction is wood, the majority of debris from demolition is concrete.

It is uncertain how much of Montana's C&D debris is disposed of with MSW. Significant quantities of building material, particularly renovation scraps, are discarded in the municipal waste stream. C&D waste can be discarded in Class II or IV landfills, and although Montana has two licensed Class IV C&D landfills in operation, most C&D waste is discarded at Class II landfills. Operators may separate C&D waste from the rest of the waste stream, but they are not required to do so.

Waste reduction opportunities for new construction begin in the design process and selection of building materials. Wood is the largest type of waste generated by new construction. It often can be reused in smaller projects or crafts. The remaining wood waste can be chipped and used as mulch, composting bulking agent, animal bedding, and fuel.

Material from demolition products can be reclaimed for recycling. Metals, in particular, maintain good market value. Concrete can be crushed and used as aggregate in new concrete.

Asphalt shingles can be used in hot mix asphalt for paving and for new roofing. Wood from demolition projects can sometimes be recycled, but often it contains lead paint or sealants that render it undesirable for recycling.

Environmental Issues

Demolition debris in particular may contain hazardous components. Lead is present in solder, flashing, and some old paint. Treated wood also contains chromium, copper, arsenic, mercury, barium, and cadmium. Drywall and plaster consist of gypsum, which contains high levels of sulfate. Asphalt, roofing tar, and tarpaper contain leachable petroleum products. All of these are commonly found in C&D waste and have the potential to contaminate the water supply if disposed of improperly. In properly sited, designed, and operated landfills, C&D wastes likely do not pose a significant threat to ground water. Laws prohibit unlicensed on-site disposal of C&D waste on private land.

Economic Issues

The most significant contributing factor in the amount of C&D waste that ends up in landfills is the high cost of material separation. Time and space to separate the wastes, the lack of demand for the materials, and the ease/low cost of landfilling are all deterrents to recycling and reuse.

2012 Barriers (Draft) to Recycling/Reuse of C&D Waste

(Listed below are draft Barriers for consideration; final Barriers will be determined through advisory committee process)

1. It is difficult and time-consuming to separate recyclables from wastes.
2. It is easy to contaminate recyclable materials with other materials.
3. The cost of disposal is low, and often it is less expensive to send everything to the landfill than it is to sort the materials.
4. It is difficult to match the available C&D materials to the needs for reuse.
5. Supplies of reused materials are inconsistent and must be considered individually for each job.

2012 Recommendations (Draft)

(Listed below are draft Recommendations for consideration; final Recommendations will be determined through advisory committee process)

1. Educate consumers so that they request C&D companies to recycle the materials from their homes and commercial buildings.

2. Educate builders about the incentives available for recycling and purchasing recycled materials. Builders may be able to benefit from tax credits for the purchase of equipment to collect and process recyclables. Builders or consumers may benefit from tax deductions for the purchase of recycled materials.

3. Look for local solutions for reuse of building materials.

4. Build waste prevention and resource management requests into construction bid documents.

5.7 Asbestos

Policy: Regulated asbestos-containing materials (RACM) are disposed of in state-approved landfills and back-filled in a manner that protects public health and the environment.

Goal: To ensure that materials containing and contaminated with asbestos are properly identified and handled to limit risk of exposure.

What Is Asbestos and Why This Goal?

Asbestos-containing materials are defined in DEQ, EPA, and OSHA regulations as materials that contain more than 1% asbestos. Asbestos is typically found in pipe and boiler insulation, duct wrap/insulation, fireproofing, plaster, drywall materials, linoleum, wall and attic insulations, wall and ceiling texture, floor or ceiling tiles, and many other materials. In the United States, asbestos was used extensively in a variety of materials from the late 1800s to the 1980s. Asbestos use has declined, but some asbestos-containing materials—primarily nonfriable asbestos materials—are still manufactured and imported, and can be found in consumer products in the U.S. (See www.epa.gov/asbestos/pubs/ban.html for information on the Ban and Phase Out of Asbestos Rule.)

Asbestos is present in many materials in the home and workplace, but is a health hazard only when the materials can be crushed by hand pressure, they are damaged in some way, or the surface is not sealed and fibers are released. In these conditions, the asbestos can become airborne and is considered "friable."

Friable asbestos materials means any material containing more than 1% asbestos that can be crumbled, pulverized, or reduced to powder by hand pressure. Examples include pipe and boiler insulation, ceiling texture, fireproofing, attic insulation, and wallboard. Nonfriable ACM contains more than 1% asbestos and cannot be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable ACMs are further categorized into two categories and include packings, gaskets, resilient floor covering (floor tile and sheet vinyl floor covering), asphalt roofing, cement asbestos materials (siding, pipe, board), putties, caulking, adhesives, and so on.

Regulated asbestos containing materials (RACM) is defined in DEQ and EPA regulations as friable ACM and nonfriable ACMs that are, or will become, friable during demolition or renovation activities. OSHA also classifies asbestos work based on work activities and the type of ACM being impacted.

State and federal asbestos regulations require RACM to be removed from public and commercial buildings prior to demolition or renovation activities. Friable asbestos-containing materials also need to be removed if renovation activities will affect asbestos-containing materials. Nonfriable asbestos-containing materials rendered friable from demolition and

renovation activities must also be removed before such activities. State and federal asbestos regulations require that only accredited (licensed) asbestos abatement contractors perform asbestos-removal activities, including asbestos waste transportation and disposal. Homeowners are advised to take the same asbestos work precautions used in public or commercial buildings, although in Montana, they are excluded from asbestos regulations.

RACM can only be disposed of **at state-licensed Class II landfills and is regulated under the Administrative Rules of** Montana (ARM) Title 17, Chapter 74, Subchapters 3 and 4 and Subpart A of Part 61 of title 40 of the Code of Federal Regulations (CFR). Subpart A of Part 61 is the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP). NESHAP governs building demolitions, renovations, active and inactive asbestos landfills, and other sources of asbestos emissions.

Before demolition or renovation of a public or commercial building, a trained and licensed asbestos inspector must conduct an asbestos inspection. The asbestos inspector must be accredited (licensed) through the DEQ (Asbestos Control Program). Although residences are not regulated by DEQ or EPA asbestos regulations, homeowners are strongly encouraged to have their homes inspected for asbestos before renovating or demolishing the structures. According to OSHA, homes demolished or renovated by the non-homeowner also need to be inspected for asbestos-containing materials. Disposal site operators are strongly encouraged to screen waste loads for asbestos-containing waste materials and ask for proof of an asbestos inspection before accepting construction/demolition waste. Additionally, the generator and transporter are required to obtain an asbestos abatement project permit from DEQ (Asbestos Control Program) if three or more linear or square feet of friable or potentially friable ACM is abated, transported, or disposed of. Furthermore, only trained and accredited asbestos abatement contractors can perform asbestos activities or handle RACM, including handling the waste at a landfill. A Waste Shipment Record (WSR) must accompany the waste from generator to disposal site. In Montana, DEQ permitted and accredited asbestos abatement project contractors handle most of the legally abated asbestos-containing waste materials.

Disposal site operators are required to report information to DEQ regarding asbestos waste disposal operations. They must include a description of the waste disposal site, a description of the method to be used to comply with the asbestos NESHAP if warranted, and methods to be used to prevent asbestos emissions. Disposal site operators are also required to retain records on waste shipments and the location of asbestos waste.

Nonfriable asbestos waste, such as cement asbestos siding, floor tile, linoleum, asphalt roofing, and so on can be disposed of as construction demolition waste if it remains intact and is not friable. Nonfriable asbestos waste should not be compacted or treated using waste minimization techniques.

OSHA and DLI have regulations governing asbestos waste disposal activities.
Contact OSHA at (406) 247-7494 www.osha.gov/SLTC/asbestos/
or DLI at (406) 444-6401 or http://erd.dli.mt.gov/safety-and-health-bureau.html

Environmental Issues - Overall

Since the early 1970s, EPA and OSHA have been concerned about the potential health hazards relating to the generation, handling, and disposal of asbestos wastes. Serious respiratory diseases and cancers, such as asbestosis and mesothelioma, can result from the inhalation of airborne (friable) asbestos fibers several years after asbestos exposure. Renovation and demolition of asbestos-containing properties pose significant health hazards to construction, transportation, and waste disposal workers as well as persons who might be exposed in their home or workplace.

Environmental Issues – Montana Specific

The longtime operation of the vermiculite mine in Libby exposed workers and residents to asbestos that was co-located with the vermiculite ore veins. Because asbestos has become more widespread in Libby than would normally be anticipated, the sources of exposure to asbestos fibers are more widespread as well. Additionally, recent research shows that the asbestos that contaminates vermiculite from Libby (Libby amphibole) is more toxic than chrysotile asbestos, which is found in most ACMs. The large volumes of asbestos-contaminated soils and construction and demolition materials are currently being backfilled into the closed vermiculite mine and landfilled at the Lincoln County landfill. More information on Asbestos in Libby can be found at www.epa.gov/superfund/accomp/success/libby.htm.

In addition to building renovations and demolitions, another source of asbestos exposure in Montana is from anthophyllite attic insulation. Anthophyllite asbestos was historically mined near Big Sky and transported to Bozeman for processing. The final product is called "Karstolite." The anthophyllite insulation has been found in the attics of several residences and commercial buildings in and around Bozeman, Livingston, and Helena. The material appears mousy-bed in consistency; however, on further analysis, one can visibly detect the raw anthophyllite asbestos fibers. It appears the material was primarily used to protect buildings from roof fires. More information on this type of asbestos can be found at http://deq.mt.gov/StateSuperfund/Karstolite.mcpx.

Economic Issues

The removal and disposal of asbestos-containing materials from residential and commercial properties may involve the services of numerous specialties at significant cost. Handling, transportation, and disposal of RACM must be performed in accordance with federal, state, and local regulations.

The presence of asbestos in homes, schools, and other public or commercial buildings may pose significant liability for the owners of those properties and the contractors who renovate or demolish them.

The health care costs associated with diagnosing and treating asbestos-related illnesses such as asbestosis, mesothelioma, and other asbestos-related cancers can be staggering for individuals and insurance providers.

Barriers and recommendations for asbestos as a special waste focus on its identification and safe disposal. There are no reuse or recycling options for this waste.

Barriers (draft) to Proper Disposal of Asbestos

(Barriers will be finalized through advisory committee process)

1. There continues to be an abundance of asbestos containing materials in buildings supplies.

2. The perception that the costs related to asbestos inspection, abatement, and disposal are high.

3. The perception there is a limited number of landfills accepting asbestos waste.

4. There are long-term liability and environmental concerns.

5. The public does not easily recognize asbestos-containing materials.

6. Contractors, building owners, and the public are not fully aware of asbestos regulatory requirements.

7. Many contractors and building owners would prefer to remain ignorant of asbestos regulations and risk the chance of being cited. In addition, many perceive that regulatory compliance is costly and causes construction delays.

8. Many contractors and building owners perceive there is no benefit in complying with asbestos regulations because there is no obvious compensation or immediate reward for regulatory compliance. Most would prefer to spend construction funds on the finished product rather than environmental regulatory compliance.

9. According to statistics, the latency period of being exposed to asbestos and potentially contracting an asbestos related illness is anywhere between 10 and 40 years. Furthermore, since there are no warning properties with asbestos exposure many do not connect regulatory compliance with exposure prevention. In other words, the sense of complying with the regulations is minimized because the danger is not immediate.

2012 Recommendations (Draft)

(Recommendations will be finalized through advisory committee process)

1. Educate building owners, contractors, and the public about the need for inspecting for asbestos prior to building demolition and renovation activities, asbestos abatement, and proper disposal. Education has started and needs to continue for all sectors. (Contractors and landfill operators can use the asbestos inspection required prior to demolition/renovation activities as a waste characterization.)

2. Train nonasbestos contractors (general contractors, plumbers, electricians, flooring contractors, drywall contractors, insulators, etc.) in asbestos regulations. Proper training is essential to maintaining the health of those working with the asbestos materials, waste transporters and landfill operators who accept the materials, and the public who use the buildings where the asbestos is being removed.

3. Form partnerships with other groups and agencies to reach goals. These partners may include DEQ, DPHHS, building code officials, building owners, the asbestos abatement industry, landfill operators and staff, and Montana Contractors Associations.

4. Continue working with EPA, OSHA, and DLI regulatory representatives on asbestos related complaints and enforcement actions.

5. Have landfills conduct self-audits concerning asbestos regulatory compliance.

6. Require landfills to maintain, update, and adhere to their O&M Plans concerning special wastes.

7. Train landfill staff on asbestos recognition and waste handling.

8. Screen waste for asbestos and other hazardous substances more often than required. Reject waste that poses regulatory and health-related liabilities.

9. Educate building code offices about asbestos regulatory compliance. Most landfills in Montana are publicly owned and operated. It would be in their best interest to strongly encourage contractors seeking building permits to comply with asbestos regulations. Such action would reduce asbestos regulatory non-compliance. Asbestos containing materials would be abated properly and waste would be disposed of properly thus reducing regulatory, protecting landfill personnel, and public health liability.

10. Increase the number of staff at agencies working on asbestos regulatory compliance.

11. Require contractors who register with DLI's Montana Construction Contractor Registration Program to learn about asbestos and applicable regulations.

12. Train the public on proper waste segregation, reduce, reuse, recycling, and disposal options.

5.8 Batteries

Policy: The State of Montana encourages use of rechargeable batteries and promotes their collection and recycling by businesses and local governments in partnership with Call2Recycle. When alkaline batteries must be used, they should always be recycled.

Goal: All Montana communities have both private and public collection centers for rechargeable batteries. When possible, alkaline battery recycling will be offered as well. Department employees will work with national partners to advocate a free recycling program for household alkaline batteries similar to a program in Canada.

What Are Batteries and Why This Goal?

Batteries convert chemical energy to electrical energy to power electronic equipment. As small, portable electronic items increasingly become part of everyday life, battery usage continues to increase. EPA estimates that nearly 3 billion household dry-cell batteries are purchased in the United States each year, along with 99 million wet-cell lead-acid car batteries and an unknown number of heavy-duty batteries for industrial applications. (http://www.epa.gov/wastes/conserve/materials/battery.htm)

Great strides have taken by industry to reduce or eliminate many of the heavy metals necessary for the electrochemical reactions that power batteries. Battery manufacturers voluntarily started phasing out mercury in 1989. In 1996, Congress passed the Mercury Containing and Rechargeable Battery Act to phase out the use of mercury in most battery types and facilitate easier recycling of nickel-cadmium (Ni-Cd) and small sealed lead-acid (SSLA) batteries. As a result, mercury is now only included when necessary for certain battery types.

Although household alkaline batteries (such as, A, AA, AAA, C, D, and 9V) can be safely disposed of in household trash now because they contain no mercury and reduced levels of heavy metals, the sheer volume being discarded continues to drive consumer interest in recycling.

Of more concern, however, are the Ni-Cd and sealed lead-acid (SLA) batteries that contain significant amounts of cadmium, copper, zinc, lead, manganese, nickel, and lithium. NiCd and SLA batteries may create a hazard to human health when disposed of incorrectly. In landfills, heavy metals have the potential to leach slowly into soil, ground water, and surface water, aided by the corrosive activity of the battery electrolyte.

These batteries play important roles in the health and safety of all citizens, providing backup power for emergency exit lights, hospitals, air traffic control, railroad crossings, weapons systems, and much more.

Source Reduction of Batteries and their Hazardous Components

Because battery manufacturers started phasing out the use of mercury in alkaline batteries in 1989, the dry-cell battery types that continue to require it are now made with much less mercury than in the past. Research continues into alternatives that would allow reduced use of heavy metals in other battery types.

Source reduction for batteries occurs at the point of purchase, where businesses, government agencies, and consumers can choose to purchase rechargeable batteries rather than disposable alkaline batteries. Purchasing rechargeable batteries reduces the need for on-going replacement of alkaline batteries and greatly increases opportunities to recycle. Free recycling programs exist for rechargeable batteries.

Recycling of Batteries

Currently, household alkaline batteries may be recycled through limited programs that charge handling and processing fees. (See www.recycle.mt.gov for a partial list of companies offering these fee-for-service programs.) Due to the costs involved, alkaline battery recycling programs are rarely established.

Rechargeable batteries contain more heavy metals than alkaline batteries, but because many of those metals trade at costs that attract private enterprises, collection programs are becoming more widespread and well known. Home improvement stores, electronic stores, and battery retailers often offer collection services for discarded rechargeable batteries. The Call2Recycle program (formerly the Rechargeable Battery Recycling Corp. http://www.rbrc.org/) is an industry-funded nonprofit organization that offers free recycling of all rechargeable batteries that weigh less than 11 lbs. (call2recycle.org). Postage-paid collection boxes are provided at no charge to retailers, public agencies, and other interested parties. Consumers can visit Earth911.org to find the nearest collection center.

Car Batteries

Car batteries contain lead and sulfuric acid, which warrant the designation of hazardous waste. Fortunately, lead has inherent value and is recyclable. In the U.S., over 95% of all automotive batteries are recovered and recycled. Virtually any place that sells batteries will accept used ones in trade.

Environmental Concerns

Although the chemistry of household batteries has changed to contain fewer heavy metals and no mercury, public perception has not. Household alkaline batteries can be safely disposed of in landfills, but DEQ receives many requests for household battery recycling programs.

3. Partner with a retailer for a focused campaign encouraging citizens to recycle the batteries that are recyclable and to buy rechargeable batteries instead of alkaline ones.

Nonalkaline batteries containing heavy metals need to be recycled to prevent potential leaching from landfills. Commercial enterprises offer free recycling for those batteries containing significant amounts of heavy metals with value. Small, rechargeable batteries weighing 11 pounds or less should be recycled through Call2Recycle, due to their heavy metal components.

Economic Issues

Although all batteries can be recycled to some extent, the Ni-Cd rechargeable type batteries are the most desirable and profitable to recycle. Unfortunately, the initial cost of this type of battery is significantly more expensive than traditional alkaline batteries.

2012 (Draft) Barriers to Battery Recycling

(Listed below are draft barriers for consideration.
Final barriers will be determined through advisory committee process)

1. Consumers do not understand that batteries are manufactured to include different chemistry and heavy metals depending upon their intended application.

2. Alkalines and rechargeables cannot be recycled together at this time.

3. Alkaline batteries are currently expensive to recycle and very few collection opportunities are available to consumers.

4. Alkaline batteries may legally be disposed of in household waste.

5. Solid waste managers, local government officials, business owners, and citizens are not aware of free recycling programs for rechargeable batteries.

2012 Recommendations (Draft)

(Listed below are draft recommendations for consideration.
Final recommendations will be determined through advisory committee process)

1. Utilize the public service announcements available free-of-charge from Call2Recycle or create such announcements for distribution across Montana.

2. Attend conferences, workshops, or annual meetings of diverse trade associations in Montana to educate about battery recycling.

5.9 Contaminated Soils

Policy: Contaminated soils will be handled in a manner that protects the public health and the environment.

Goal: Ensure adequate and consistent processes to remediate contaminated soils and return them to beneficial uses.

What Are Contaminated Soils and Why this Goal?

When petroleum products, solvents, or other toxic chemicals leak or spill onto soils, action must be taken to prevent the migration of the contaminants into ground water or surface water. Contaminated soils are considered solid waste when two conditions are met: first, the corrective action plan for cleaning the site requires the removal of the contaminated soils from the site rather than "*in-situ* treatment;" and secondly, the soils are not hazardous. Contaminated soils as well as sump solids from vehicle service centers and car washes are regarded as Group II solid waste; these are handled as contaminated soils, provided that they are not RCRA listed or characteristic hazardous waste. If soils are determined to be hazardous, they are regulated under hazardous waste rules. Waste managers must ensure environmentally sound treatment and disposal.

DEQ licenses soil treatment facilities and has prepared guidelines for their operation. DEQ is currently preparing amendments to its solid waste rules that will address soil treatment facilities (www.deq.state.mt.us/pcd/emb/index.asp).

Landfarms

Landfarming, also known as land treatment or land application, is an aboveground remediation technology for soils that reduces concentrations of petroleum constituents through biodegradation (www.epa.gov/swerust1/cat/landfarm.htm). Before bioremediation, or landfarming, is done, a soil and land assessment/acceptability must be preformed. If the soils contain high mineral deposits or high concentrations of TPH (Total Petroleum Hydrocarbons) or metals, landfarming is not the best option and another technology much be selected.

In a landfarming process, the contaminated soils are spread on the land surface in 6 to 12-inch lifts and occasionally tilled, so that sunlight, air, and soil microorganisms can break down or evaporate the contaminants. Bioremediation of excavated contaminated soils by indigenous or introduced soil microorganisms may be effective if the environmental conditions and management practices can support microbial metabolism.

The siting of a soil treatment facility (landfarm) is dependent on groundwater levels, proximity to drinking water supplies and residential areas, slope of landfarm area, public accessibility, and adequacy of the treatment area for volume of contaminated soil. Facilities are categorized according to the acreage required to remediate the contaminated soil.

In 2010, six facilities in Montana were licensed as soil treatment facilities, and five Class II Landfills were licensed to include soil treatment facilities. Contaminated soils are typically landfarmed on-site in Montana or taken to landfills. Numerous sites may have been licensed as "one-time" landfarms for *in situ* remediation.

Treatment Alternatives

Other treatment processes are available at varying cost, effectiveness, and environmental concern. Thermal desorption, aeration, and mechanical techniques have been developed that remove volatile organic compounds into a contained air space. The contaminated air stream can be subsequently treated through carbon filtration, water scrubbers, or afterburners to reduce air emissions. Incineration, air venting systems, soil washing, biopile, and composting processes are also in development.

Bioremediation allows natural processes to clean up harmful chemicals in the environment. Certain microscopic "bugs," or microbes, that live in soil and groundwater eat chemicals, such as those found in gasoline and oil spills. When microbes completely digest these chemicals, they change them into water and gases such as carbon dioxide.

Soil recycling uses a combination of enhanced bioremediation and mechanically induced volatilization to reduce contaminant constituents in soils. Specially cultured microbes, white rot fungus, bacteria, fungi, oxygen, and nutrients are introduced to the contaminated soils in this process.

Environmental Issues

While treatment and disposal methods may provide greater protection than leaving the soils untreated on-site, they raise some environmental concerns. Depositing large amounts of petroleum-contaminated soil in a landfill takes up valuable space and introduces contaminants that may eventually leach from the landfill. Landfarming also releases volatile organic chemicals into the air, which may be of concern to surrounding residents. Petroleum products generally contain more than 100 different constituents that possess a wide range of volatility. The volatility of contaminants proposed for treatment by landfarming is important because volatile constituents tend to evaporate from the landfarm, particularly during tilling or plowing operations, rather than being biodegraded by bacteria. In general, gasoline, kerosene, and diesel fuels contain constituents with sufficient volatility to evaporate from a landfarm. Lighter (more volatile) petroleum products (gasoline) tend to be removed by evaporation during landfarm aeration processes. Heavy precipitation increases the danger of leachate formation. Landfarms must regularly monitor air, water, and soil contaminants.

Economic Issues

Landfarming is a cost-competitive treatment for contaminated soils, running between $30 and $60 per ton (www.epa.gov/oust/cat/landfarm.htm). If contaminated soils are shallow (less than 3 feet below ground surface), it may be possible to effectively treat the contamination without excavating the soils.

Barriers (Draft) to Proper Management of Contaminated Soils

(Listed below are draft barriers for consideration.
Final barriers will be determined through advisory committee process.)

1. The general public lacks clear understanding of what is a contaminated soil.

2. There is a lack of clear criteria for what to do with contaminated soils.

3. A large amount of space is required.

4. Runoff collection facilities must be constructed and monitored.

2012 Recommendations (Draft)

(Listed below are draft recommendations for consideration.
Final recommendations will be determined through advisory committee process.)

1. Increase the use of bioremediation by providing demonstration projects to increase awareness and provide best management practices.

2. Increase the amount of contaminated soil used as daily cover in landfills.

5.10 Electronics Scrap

Policy: Electronic scrap entering landfills shall be eliminated through source reduction, reuse, and recycling.

Goal: Montana communities will reduce the amount of electronics waste going into their landfills through reuse and, when practical, recycling.

What is Electronic Scrap and Why This Goal?

Innovations in technology have led to increased use of electronics, which in turn has increased electronic scrap (e-scrap). E-scrap includes phones, computers, business equipment, entertainment and communications equipment, and thousands of other products used in homes and businesses today. E-scrap contains plastic, heavy and rare earth metals, as well as toxic chemicals, and can contribute to pollution if not properly managed.

Source Reduction in Computer Scrap in Montana

EPA worked with manufacturers to develop the voluntary EPEAT electronics certification program, which provides incentives for computer manufacturers to meet 23 environmental performance criteria. These cover recyclability, energy conservation, reduced toxicity, end-of-life management, packaging, and corporate performance. The program has been very successful and participation by manufacturers continues to increase. By spring 2012, there were more than EPEAT-certified 2,500 computer products available (visit www.epeat.net for more information). EPEAT will be expanded to include printers, copiers, and similar equipment over time.

Like many other states, Montana requires EPEAT-certified products in its procurement contracts for state computers. Local governments, and certain other political entities in Montana, can participate in these procurement contracts by contacting the Department of Administration.

E-Scrap Reuse in Montana

The number of unwanted electronics generated by the desire or need for technical upgrades is growing, and there is a good reuse market for these products. For example, markets for used cell phones are very strong, offering fundraising opportunities for Montana schools and other organizations. Cellular telephone companies gladly accept back any scrap cell phone, regardless of the name brand.

Montana legislation passed in 1999 made it possible for state agencies to donate their outdated electronic equipment to public schools through a program administered by the Office of Public Instruction. This reuse program has resulted in more than 3,000 computers going to Montana

public schools. Other reuse programs also expand the useful life of computers, benefitting the environment and providing a charitable service. There are national online programs, as well as local storefront programs that connect people who need computers and those wishing to donate them.

E-Scrap Recycling in Montana

Due to the rare earth metals, gold, and other recoverable metals found within most products, recycling opportunities for e-scrap have grown substantially. Even products such as televisions and computer monitors, which contain fewer valuable metals, can be recycled. Many electronics can be recycled for free or for very little cost, but other equipment carries a recycling fee.

Electronic recycling is one of the fastest areas of growth within the scrap recovery industry. There are no processors of e-scrap within Montana, but several recycling businesses collect, consolidate, and prepare e-scrap for shipment to processors elsewhere. These e-scrap "recyclers" are licensed by DEQ as solid waste systems.

DEQ began to partner with communities in 2006 to organize electronic collection events. Several communities now offer events annually or have started permanent collection programs. Montana citizens have recycled nearly 3 million pounds of electronics since 2006.

The DEQ website (www.recycle.mt.gov) provides information on retail, manufacturer, and online recycling opportunities, as well as a brochure on organizing community collection events.

E-Scrap Disposal in Montana

EPA estimates that electronics make up nearly 2% of the municipal waste stream and that the sheer volume of electronics in the waste stream will greatly increase as personal electronic use continues to expand. EPA estimates that over 80% of electronics are disposed of in landfills across the U.S. The majority of electronic waste in Montana is landfilled, partly because access to e-scrap recycling is limited to annual events, and partly because access to retail programs may require transporting the e-scrap long distances to stores. A handful of municipal and private solid waste companies offer year-round recycling opportunities.

Environmental Issues

Although small amounts of heavy metals may be used in each electronic, the volume of e-scrap in landfills raises concerns about potential leaching and cumulative effects. Mercury, lead, cadmium, and PCBs can leach when circuit breakers, cathode ray tubes, and monitors are exposed to acid waters, as can happen in landfills. EPA states that 80% of the recycling operations in the U.S. operate within the confines of national and international laws regarding the shipment of hazardous waste. As regulator for the e-scrap industry, EPA has issued enforcement action and fines to a small number of e-scrap recyclers caught in violation of international laws and treaties. Working with industry watchdogs and trade organizations, EPA

is addressing the illegal export of e-scrap to countries with primitive recycling practices and lax environmental protections.

ISRI has established guidelines for proper management of end-of-life electronics. In addition, EPA worked with stakeholders to establish the Responsible Recycling (R2) Practices certification program to verify and identify recyclers in compliance with national and international laws. E-Stewards, another certification program, is managed by an NGO and includes higher standards for compliance. DEQ encourages communities to prepare for questions about illegal exportation and recycling of e-scrap during community collection events.

Economic Issues

The electronics recycling industry has been growing rapidly, and companies are now merging and consolidating operations, as well as developing methods of recycling hard-to-handle materials (e.g., CRTs). These activities are expected to lower recycling service fees, but may not eliminate them.

2012 Barriers (Draft) to Recycling Electronics Waste

(Listed below are draft barriers for consideration.
Final barriers will be determined through advisory committee process.)

1. Although nearly 94% of Montanans have access to electronics recycling, the choices available are limited; rural areas in particular have very few options.

2. Free recycling and pay-for-service recycling may only be available for certain brands of electronics or certain types of electronics.

3. Transportation costs to processors are high.

2012 Recommendations (Draft)

(Listed below are draft recommendations for consideration.
Final barriers will be determined through advisory committee process.)

1. Work with landfill managers to establish permanent collection locations for electronics at landfills, transfer stations, and similar locations already used by consumers for waste disposal.

2. Work with electronics recyclers and consolidators to expand access to electronic recycling across Montana.

5.11 Animal Waste

Policy: All animal mortalities shall disposed in a manner that is protective to human and animal health and the environment by ensuring the proper disposal of animal waste and carcasses, especially that of diseased animals.

Goal: Montana communities shall implement Best Management Practices to dispose of animals and their wastes, and prevent outbreak or spread of disease from infected wastes by containment, proper disposal, and decontamination of infected areas.

What Is Animal Waste and Why this Goal?

Animal waste is primarily derived from the agricultural sector—i.e., farms, ranches, and livestock holding areas—but it can also include wild game and animals from managed game farms. Animal waste includes whole and parts of carcasses from butchering or veterinary medical procedures.

There are two primary concerns with disposal of animal waste: the effect it may have on water quality in the process of natural decomposition, and the potential of spreading disease. Anthrax, foot and mouth disease, chronic wasting disease (CWD), and bovine spongiform encephalopathy are just a few of the diseases that could be spread by inadequate disposal of sick animals. While these diseases do not currently pose a threat in Montana, a few national and international incidents have occurred.

Montana landfills need to carefully dispose of animal waste, as well as be prepared to handle an incident should it occur. In the event of an outbreak of a highly contagious animal disease, special measures must be taken to ensure the disease agent is eradicated, both to contain the outbreak and to prevent its revivification at a future time. In some cases, the agent will not survive long after the death of the infected organism, and proper burial is sufficient for the animal carcass. Other diseases require incineration for eradication. Determination of the correct option is addressed on a case-by-case basis by state agencies. It is the owner's responsibility to properly dispose of animals known to be sick.

Animals found on public roadways are handled by the Montana Department of Transportation (DOT), which usually removes the carcasses and takes them to maintenance facilities to be composted. Animal carcasses found in the wild can typically be left to naturally decompose, unless they appear to have died from a threatening disease. In that case, the animal should be reported to the Montana Department of Fish, Wildlife and Parks (FWP).

Entrails and other organic remnants from hunting can typically be disposed of with regular household waste, while hides can often be sold to "hide and fur" locations throughout the

state. An animal corpse can also be disposed of on private property with the consent of the owner.

DEQ regulates some aspects of the disposal of dead animals under §§ 75-10-212 and 213, MCA, and provides guidelines for proper burial of animals. For animals that did not die from a contagious disease, the primary disposal method is to bury them in a high and dry location to protect state water and wells. Animals buried on site must be covered with a minimum of two feet of soil. The Department of Livestock provides guidelines for the disposal of animals from agricultural operations.

Environmental Issues

Water and air quality can be adversely affected by the waste generated by large animal operations. Human health and animal health similarly must be protected from these wastes when they can contaminate the environment. Concentrated feedlots or other operations that have large volume and high concentrations of animals and waste must follow guidelines set forth by state and federal government agencies.

Economic Issues

Images of cowboys driving cattle across the range and families living off the land remain more truth than myth in Montana. Livestock, mainly cattle and sheep, continue to graze the vast federal, state, and private lands throughout the state, while dairy and other animal products are produced in all corners. Hunting draws a large group of visitors to the state each year. Thus, the health of animal-related industries is vital to the image, economy, and environment of the state.

Rendering plants are the main source for recycling dead animals, slaughterhouse wastes, and supermarket waste into various products known as recycled meat, bone meal, and animal fat. These products are sold as a source of protein and other nutrients. Currently, there is no rendering plant in Montana.

Barriers (Draft) to Recycling Animal Waste

(Listed below are draft barriers for consideration.
Final barriers will be determined through the advisory committee process.)

1. Labor costs are high to recycle or compost animal waste.

2. Montana has no commercial rendering facility to process animal waste for use in new products.

2012 Recommendations

(Listed below are draft recommendations for consideration.
Final recommendations will be determined through the advisory committee process.)

1. Compost animals at landfills and use the compost as daily cover.

5.12 Pharmaceutical Waste

Policy: The disposal of unwanted and/or outdated pharmaceutical waste is conducted in a manner that protects human health and the environment.

Goal: All unwanted pharmaceutical waste will be disposed of in an environmentally responsible manner.

What Is Pharmaceutical Waste and Why this Goal?

Pharmaceutical waste encompasses prescription and over-the-counter therapeutic drugs, veterinary drugs, diagnostic agents, and supplements such as vitamins. It also includes personal care products (PPCPs) such as fragrances, cosmetics, and sun-screen products.

The pharmaceutical industry estimates that 3% of the prescriptions written in the U.S. are filled but never used. The preferred disposal option for these prescriptions is through take-back programs when available. When this is not possible, the preferred method of disposal is the place medication in a sealed container and place into the landfill. These products should never be flushed into sewer or septic systems.

Montana Statewide Prescription Drug Disposal

The Montana Department of Justice (DOJ) launched Operation Medicine Cabinet in 2010 to assist local law enforcement agencies in establishing permanent prescription drug drop-off locations. Though developed primarily to prevent illegal use of prescription drugs, this program has the added advantage of ensuring the proper disposal of pharmaceutical waste.

Several Montana communities have established permanent drop-off locations. DOJ also sponsored a "take-back tour" in spring 2011, which collected hundreds of pounds of unused prescription medicine. See www.doj.mt.gov/rxabuse/storagedisposal.asp for more information on the DOJ program.

Environmental Issues

The two greatest concerns related to improper disposal of pharmaceutical waste are hormone disruption in fish and other animals, and the creation of bacteria resistant to antibiotics. EPA has added 13 pharmaceutical products to its Contaminant Candidate List to be considered for inclusion under the Safe Drinking Water Act. The National Toxicology Program is also researching the effects on human health of low-dose exposure to pharmaceuticals in drinking water.

Collection of unused prescription medications through take-back programs ensures proper disposal of pharmaceutical waste. In addition to the work being done at the state level, the Food and Drug Administration has an educational program for consumers about proper

disposal of unused medicine (www.fda.gov). The U.S. Fish and Wildlife Service and the American Pharmacists Association also have joined forces to establish the SMARxT Disposal program (www.smarxtdisposal.net).

Economic Issues

Drug take-back programs require money for collection and processing. The programs rely on donations or grants and may not be sustainable.

2012 Barriers (Draft) to Proper Disposal of Pharmaceutical Waste

(Listed below are draft barriers for consideration. Final barriers will be determined through advisory committee process.)

1. Cost of the collection event and the disposal of the prescriptions.

2012 Recommendations (Draft)

(Listed below are draft recommendations for consideration. Final recommendations will be determined through advisory committee process.)

1. Expand availability of permanent drop-off locations.

5.13 Carpet and Textiles Recycling

Policy: The State of Montana promotes recycling of scrap carpet and other textiles.

Goal: An increased number of carpet retailers will offer carpet recycling services in Montana. Independent textile recyclers will work together to increase efficiencies in collection, handling and transportation. County and local governments will separate and recycle carpet and other textiles to the best of their ability.

What Is Carpet and Textiles Recycling and Why this Goal?

The term "textiles" is used to describe the reused clothing, shoes, blankets, rags, and more that are diverted from landfills through consumer and commercial donations. A large percentage of textiles are still landfilled, but a healthy industry of reuse typically keeps market prices steady for textiles. This market is driven primarily by consumer demand for used clothing and similar items.

Carpets are manufactured to withstand years of wear and are difficult to manage as scrap. Because carpets consume large amounts of petroleum-based materials, industry efforts are leading the way in carpet recycling. Carpet recycling began in Georgia, when Interface Carpet started to decrease its use of nonrenewable fuels and increase sustainability. It grew into an industry-wide effort through the Memorandum of Understanding for Carpet Stewardship, a voluntary agreement between EPA, industry, NGOs, and state governments. The MOU set a national goal to divert 40% of scrap carpet by 2012, through reuse, recycling, cement kilns, and waste-to-energy. A third-party organization, Carpet America Recovery Effort (CARE), was established to coordinate carpet recovery efforts. The market for scrap carpet is driven by industry in recognition of the material's value as a recycled commodity and, in some cases, an alternative fuel for the recycling operations.

Carpet and Textile Recycling in Montana

Montana does not have well-established carpet recycling activities at this time. Textile recycling is well established, with national chains of thrift stores and local, independent second-hand stores scattered throughout Montana.

The only known carpet recycling program available for Montana consumers is offered by Pierce Flooring and Design, a regional retailer with eight stores in the state. Company staff spent three years researching and planning the program before its launch in 2008. The program was initially available to commercial customers but now also includes residential customers.

A semi-trailer is located at each store to provide temporary storage and final transportation of the used carpets to an out-of-state recycling processor. Pierce generally ships to a processor located in either Washington or California. Pierce pays the freight charges as well as pays the processor to accept the scrap material. Pierce staff explained that the recycling program is a

budget item and does not generate revenue for the retailer. The company is able to save money by avoiding landfill tipping fees and expects the program to become cost-neutral as it matures.

The program is considered a success and Pierce is proud to have recycled over 1,350,000 pounds of scrap carpet and padding. This equates to 2,800 square feet of carpet, or enough to cover 50 football fields. Pierce is part of the CARE program, which collects data on volumes collected and provides a report for participants describing the resources and GHG saved through their efforts.

Environmental Issues

Carpet manufacturing is an energy-intensive process which creates a petroleum-based final product. Scrap carpet should be recycled into commodity-grade resins and fibers, which then have market value. Scrap carpet in landfills is somewhat difficult to manage due to its weight and bulkiness.

Economic Issues

There are collection and consolidation activities regarding textiles and carpet in Montana, but there are no processors. Most textiles are sent to Washington State and processed for rags, re-sold, or shipped to other countries. In general, the textile recycling market is steady, with collectors receiving revenue for their baled textiles. Processors for carpet, however, are paid to accept the material and separate the carpet into padding, backing, and other materials, which are then sold back to industry. More retailers could participate, but while landfill tipping fees are relatively low in Montana, there is little incentive to avoid the fees through recycling.

2012 Barriers (Draft) to Proper Disposal of Pharmaceutical Waste

(Listed below are draft barriers for consideration. Final barriers will be determined through advisory committee process.)

1. Only one carpet dealer in Montana offers recycling services for old carpet when making a new purchase. At this time the service is limited to carpet scraps generated from commercial, not residential, facilities.

2. Landfill tipping fees are too low to provide adequate financial incentives for carpet retailers to change operations and begin recycling programs.

3. There are no scrap carpet consolidators or processors in Montana.

2012 Recommendations (Draft)

(Listed below are draft recommendations for consideration. Final recommendations will be determined through advisory committee process.)

1. Support CARE efforts to expand carpet recycling in Montana.

2. Educate businesses and consumers regarding the ability and need to divert carpet from landfills.

3. Organize a webinar or workshop on carpet recycling, the requirements and tools made available through CARE, and the savings realized by participants.

4. Educate solid waste managers and local officials regarding the volume of landfill space that can be saved through diversion and recycling.

5. Encourage transfer stations and landfill operations to create set-aside areas for textile waste.

Chapter 6: Industrial Waste

Policy: The State of Montana implements an integrated approach to nonhazardous industrial solid waste management, based on the following order of priority: (1) source reduction; (2) reuse; (3) recycling; (4) composting; and (5) landfill disposal or incineration.

Goal: The State of Montana will steadily reduce the amount of nonhazardous industrial waste that is disposed of by landfilling or incineration.

What Is Industrial Waste and Why this Goal?

Industrial solid wastes are all nonhazardous wastes generated by industries and businesses. Although industrial wastes are not covered under the Montana Integrated Waste Management Act, they are handled as wastes in the state and therefore discussed briefly in this plan.

Industrial waste is address by Standard Industrial Code, and includes the following range of business activities:

- SICs 01-09 Agriculture, Forestry & Fishing
- SICs 10-14 Mining
- SICs 15-17 Construction
- SICs 20-39 Manufacturing
- SICs 40-49 Transportation, Communication & Utilities
- SICs 50-51 Wholesale Trade
- SICs 52-59 Retail Trade
- SICs 60-67 Finance, Insurance & Real Estate

The wastes associated with SCIs above 50 generally go into the municipal waste stream and are included in the first chapters of this plan. Construction and demolition wastes (SICs 15-17), also generally part of municipal solid waste, are addressed in Chapter 5.6.

The waste streams for the remaining industries—agriculture, forestry, fishing, mining, and manufacturing (including oil and gas production, utility coal combustion, cement production, and other manufacturing processes)— are extremely large and complex, and far beyond the scope of this plan. Coal combustion waste is addressed in Chapter 6 of this plan because of work to reuse this waste in Montana.

Industrial Waste in Montana

Before October 1991, Montana law (§ 75-10-214, MCA) allowed persons to dispose of their own solid waste on their own land unless the land was a subdivision of fewer than five acres. "Persons" included businesses, industries, and any private or governmental entities. In 1991, the

law changed to allow only persons whose waste is generated in "reasonable association with (their) household or agriculture operations" to dispose of their own waste on their own land. In other words, businesses and industries are now required to either haul their wastes to a licensed site or license their own site. The law specifically excludes certain industries from this requirement on the premise that they are regulated by other state agencies. These are electric generating facilities, operations related to the drilling, production, and refining of natural gas or petroleum, and the operation of a mine, mill, smelter, or electrolytic facilities. Various state agencies regulate portions of the waste stream of these industries. Regulating agencies usually consider only the dominant wastes such as hazardous materials, waste rock, fly ash, and petroleum or other contaminated soils, metal slag, and spoils. Other solid wastes, such as low-volume, nontoxic wastes from operations, shops, or offices, may not be regulated.

Recycling/ Beneficial Use

Industrial materials recycling, sometimes referred to as "beneficial use," means reusing or recycling byproduct materials generated from industrial processes. These materials can be used as substitutions for raw materials in the manufacture of consumer products, roads, bridges, buildings, and other construction projects.

Montana has implemented a Beneficial Use Determination of Industrial and Manufacturing By-products (BUD). The determination is made by the DEQ's Solid waste Program that exempts an individual who proposes to use an industrial byproduct otherwise destined for disposal in a licensed landfill form obtaining a solid waste management system license when the waste is used in a specific and beneficial manner. BUDs are approved case-by-case based upon the nature, quantity, and end use of the byproduct material, as well as the impact to the environment of the proposed beneficial use area.

Nonhazardous industrial materials—such as coal ash, foundry sand, construction and demolition materials, slag, and gypsum—are valuable products of industrial processes. Each material may be recycled in a variety of diverse applications. These materials have many of the same chemical and physical properties as the virgin materials they replace and can even improve the quality of a product. For example, the use of coal fly ash can enhance the strength and durability of concrete. Putting these commodities into productive use saves resources and energy, reduces greenhouse gas emissions, and contributes to a sustainable future.

Environmental Issues

EPA estimates that about 7.6 billion tons of industrial solid waste are generated and managed on-site at industrial facilities each year. Almost 97% of that is wastewater managed in surface impoundments; the remainder is managed in landfills, waste piles, and land application units. Most of this wastewater is treated and ultimately discharged into surface water under Clean Water Act permits, issued by EPA, or National Pollutant Discharge Elimination System permits, issues by state government.

Guidance

EPA, in collaboration with states, industry, and environmental groups has published *Guide for Industrial Waste Management* (www.epa.gov/industrialwaste). The focal point of the guide is the protection of human health and the environment. The guide helps:

State environmental staff to:
- Establish baselines for industrial waste management or supplement current programs and policies.
- Conduct rapid site-specific assessments.
- Develop partnerships and challenge programs with industry, trade groups, environmental organizations, and the public.

Facility and environmental managers to improve their waste management practices by:
- Using the air and ground water models to assess specific risks.
- Training employees about handling specific kinds of waste.
- Implementing the waste reduction measures to save resources and reduce costs.

Concerned citizens to gain a better understanding of industrial waste in their communities by:

- Reading about different types of waste management units, technologies, and practices.
- Using the audiovisual tutorials for an overview of industrial waste management issues.
- Becoming community leaders with expertise in these issues.

CHAPTER 7: Community Approaches to Integrated Waste Management

Integrated Waste Management programs provide communities and local governments an increased ability to manage costs, control items accepted at landfills, or extend the useful life of landfills. Costs related to solid waste management continue to increase for most communities, regardless of whether the landfill is municipally or privately operated. For most communities the majority of resources focus on the most expensive and least-preferred management option: landfilling. An effective method of managing solid waste costs will include concepts from each step of the waste hierarchy in order to reduce the volume of waste which must be buried and monitored.

First Step:	Source Reduction = avoid generating waste in the first place.
Second Step:	Reuse = find an alternative use for the material (e.g. glass bottles minimally processed to create cullet).
Third Step:	Recycling = earn income from valuable commodities instead of paying to landfill the material.
Fourth Step:	Composting = turn yard waste and other organics into a valuable product while conserving landfill space.
Final Step:	Landfilling = the most costly waste management choice, requiring continued monitoring after closures (no tipping fees generating income).

Communities can shift focus and resources away from landfills when programs and infrastructures are built to support the alternative management concepts identified in the Montana Integrated Waste Management Act. Successful programs include actively engaging consumers and commercial businesses in source reduction, reuse and recycling programs. The resources listed below provide assistance, templates, and information for effective integrated waste management:

Hub and Spoke Community Partnerships

The Department will assist with setting up "Hub and Spoke" agreements with neighboring communities to increase opportunities for recycling. This strategy allows lower-populated areas to cost-effectively address problems related to collecting, marketing, and transporting the smaller amounts of recyclables generated.

Local Ordinances

An ordinance is a law passed by municipal governments, typically to govern behavior, such as banning texting while driving or requiring snow removal from public sidewalks. Nationwide, communities have also used ordinances to direct the types of material to be diverted from landfills or to direct recycling activities. Ordinances may implement recycling programs for commercial and multi-family dwellings, or declare that certain items are diverted for recycling (e.g. cardboard). Information, including templates on solid waste-related ordinances are available from the Institute for Local Government (www.ca-ilg.org), as well as other communities.

Contracts/Agreements

Contracts and legal agreements are useful tools for providing incentives to reduce tons landfilled while rewarding and encouraging waste prevention, reuse, recycling and composting activities. Economic incentives such as Pay-As-You-Throw, revenue sharing, bonus and penalty payments which are dependent upon goals reached, franchise fees, and similar strategies are utilized by communities across the country to build successful integrated waste management systems. Resources are available from the EPA and UNEP (United Nations Environment Program), to assist with implementing contracts and legal agreements which foster an integrated approach to waste management.

Getting Started 101

The framework(s) and suggested activities listed below serve as basic guidelines for revising current waste management practices to include an integrated approach. Earlier versions of this plan include explanations that are more extensive; the information below includes just major points and is designed with rural communities in mind.

Local Government Framework For Implementing An Integrated Waste Management System

1. Set up a citizen's solid waste advisory committee. The committee should include both public and private interests as well as local experts. Committee responsibilities should be clearly outlined with specific goals or projects to be accomplished.

2. Do an audit of the local waste stream. The information gathered will establish a foundation for any projections, while providing a snapshot of current conditions. The Solid Waste Management (SWM) Program will provide waste audit information to communities.

3. Write a local integrated solid waste management plan. A local plan addresses the economic conditions and resources which are unique to each community.

4. Implement aggressive public education. Education campaigns are necessary to spread awareness and encourage participation. Utilize community partners and existing businesses to help spread the message.

5. Provide incentives for waste reduction. Economic incentives encourage the private sector to participate in solving solid waste management problems while supporting local recycling goals. In addition to economic incentives and disincentives, communities can offer awards programs and other public recognition programs to businesses or individuals that reduce their waste.

6. Target large industrial waste components. Review local industry activities to identify large generators of waste material and work with them to develop alternative management strategies.

7. Explore cooperative agreements and structures. Small communities may be able to coordinate recycling drives, taking advantage of higher volumes of materials and lower transportation costs. Communities may be able to share mobile balers, shredders, and crushers.

8. Build on existing programs. When possible, build on existing programs to minimize capital costs. Save further costs by considering the use of existing container sites, landfills, and transfer stations as part of the new integrated waste management system.

An Integrated Waste Management Plan may include one or more of the following:

1. Recycling drop-off bins with marketing to nearest buy-back center
2. Drop-off for yard waste and windrow composting
3. Roll-off waste containers for disposal
4. Curbside collection of yard waste and aerated static pile composting with sewage sludge and green wastes
5. Waste exchanges, swap programs, yard sales, thrift stores
6. Community recycling collection events
7. "Buy-recycled" policy for local government
8. Rate structure incentives
9. Residential curbside collection of recyclables
10. Reuse/repair center
11. Collection programs for commercial sector recycling
12. Environmentally sound landfill in the region
13. Materials recovery facility/transfer station

Chapter 8. Recycling Infrastructure Improvements for Montana's Solid Waste Management Systems 2009 American Recovery and Reinvestment Act (ARRA)

Policy: The State of Montana promotes infrastructure improvements to increase recycling and waste diversion opportunities within Montana communities.

Goal: An increased number of systems/facilities within Montana that can collect, package, and ship recyclables to population centers that can further process collected materials.

What Is ARRA and Why this Goal?

The greatest recycling infrastructure needs in Montana are in-state markets for collected recyclables and the community resources to implement local programs. Many Montana rural and small communities lack the funds to purchase the equipment needed for collection, storage, and transportation of recyclables. Smaller communities also generate fewer of these materials, which makes return on investment in community recycling programs even more difficult. In addition, Montana's vast distances become a barrier to recycling; some residents and businesses have to travel more than 100 miles to reach the nearest recycling center.

The 2009 American Recovery and Reinvestment Act (ARRA) provided funding that helped more than 20 Montana communities improve their recycling infrastructures, making it possible for local governments, solid waste districts, communities, and residents to:

- Reduce energy consumption and greenhouse gas emissions associated with resource consumption.
- Reduce the affects of resource extraction caused by production from virgin materials.
- Increase resource conservation;
- Create greater recycling economies of scale in rural, underserved areas of the state.
- Maintain current solid waste jobs and/or create new and permanent jobs.

Recycling Infrastructure Grants

The Recycling Infrastructure grants were open to local governments, nonprofit organizations, and private enterprises. More than 44 applicants requested more than $1 million in funding, an indication of the need and desire for recycling infrastructure in Montana. Most applicants were cities, counties, and solid waste districts.

Nineteen recipients received funding, for a total of $311,000. A maximum of $25,000 could be requested with a minimum 5% cash match required. In large part, grantees used funding to purchase balers, bins, trailers, and sheds to process various recyclable materials.

For many communities, Infrastructure Recycling funds provided their first opportunity to offer local recycling resources. For example, Granite County purchased two down-stroke balers, placing one in Drummond and one in Philipsburg, enabling it to collect cardboard and certain plastics for the first time.

In addition to diverting waste from local landfills, grantees increased their revenues. The Flathead County Solid Waste District, for example, used award funds to install a compactor at its busiest recycling site in Kalispell, enabling it to recycle 72% more cardboard, decrease handling and transportation costs by 69%, and increase revenue from recycled cardboard by 68%.

Some of the communities were able to leverage the funding for an even greater return on investment. For example, Lake County, which accepted a range of recyclables at its transfer station in Polson, purchased four roll-off recycling containers: three with its ARRA funds and one with other funds. The bins were placed in Polson, Ronan, St. Ignatius, and Pablo. The City of Polson also received a recycling infrastructure award, which it used to purchase collection bins to place around the city and a flatbed trailer to take the bins when full to the transfer station. Finally, Lake County also received an ARRA Energy Efficiency and Conservation Block Grant, which it used to purchase a metal can sorter for its transfer station. With these combined improvements, Lake County anticipates nearly $9,000 a month in waste disposal fees and diverting more than 144 tons from its landfill — all part of its goal to recycle 22% of its waste stream by 2015.

Home ReSource Inc. (HRI), of Missoula, was the single reuse enterprise receiving an infrastructure award. The largest building materials reuse center in the state, the nonprofit used its award to help launch its ReVAMP (Repurposed, Value-added, Marketable Products) Shop by funding the purchase of an array of tools. The shop expands the amount of waste HRI can accept by providing more storage space and making it possible for the business to accept materials that are too deteriorated to be sold as is. HRI staff transforms these items into ready-to-install fixtures and home furnishings that are sold to area residents. Shop space can also be rented by area entrepreneurs. As a result, tons of waste that previously ended up in landfills is now being reused. In addition, with its expanded services, HRI added one full-time and one part-time permanent positions.

Hub and Spoke Recycling Grants

Hub and Spoke recycling programs provide an efficient and cost-effective structure for rural communities to increase recycling. "Spoke" communities establish convenient drop-off locations for recyclables from businesses and residents, then deliver these materials to a "hub" community for processing and marketing.

The competitive award program funded through ARRA was open to local governments, which could also serve as pass-through agencies for unincorporated communities, nonprofit entities, and private companies. It required the collaboration of a minimum of three communities within

a region. Hub communities invested in the infrastructure needed to process and store the materials, and the spoke communities invested in collection bins and transport equipment.

A total of $200,000 was available. For each regional project, a Hub community could receive up to $50,000 and two spoke communities $25,000 each.

Four Hub and Spoke projects where funded by this program, including one to the Hub community of Miles City, the seat of Custer County, and the Spoke communities of Glendive and Terry, the respective seats of Dawson and Prairie counties. Together, these three counties cover 7,893 square miles and have a population of 21,844, or fewer than three people per square mile. A consolidated recycling program, therefore, was an ideal solution.

In this instance, Miles City was a pass-through agent for Eastern Montana Industries (EMI), which provides residential and vocational services for adults with disabilities. EMI had an existing recycling center in Miles City and provided limited recycling services to Glendive and Terry. Award funding allowed EMI to significantly improve its program by purchasing three balers for its Miles City recycling center and a collection trailer for each community. Collectively, the expanded program is expected to generate nearly 2.8 million pounds of recyclables a year — a substantial savings in energy as well as increased revenue for EMI and job opportunities for its client base.

Other AARA Funds

Recycling and reuse was also an element in other ARRA award funding. For example, Montana received funding for an Energy Efficient Appliance Rebate Program, providing rebates to consumers purchasing Energy Star-rated appliances with the stipulation that their old appliances be recycled rather than disposed of in landfills.

Recycling and reuse of materials whenever possible was also a stipulation of the Energy Efficiency and Conservation Block Grants, which provided competitive funding for local governments and rural healthcare organizations.

Economic Issues

Recycling infrastructure improvements make it possible for local governments to save waste disposal costs as well as earn revenue from sales of recyclables. In addition, marketing recyclables provide jobs.

Chapter 9: PUBLIC COMMENT SUMMARY

TO BE WRITTEN UPON FINALIZATION

APPENDIX A: THE INTEGRATED WASTE MANAGEMENT ACT

75-10-801. Short title. This part may be cited as the "Montana Integrated Waste Management Act".

History: En. Sec. 1, Ch. 222, L. 1991.

75-10-802. Definitions. As used in this part, the following definitions apply:

(1) "Composting" means the controlled biological decomposition of organic matter into humus.

(2) "Department" means the department of environmental quality provided for in 2-15-3501.

(3) "Integrated waste management" means the coordinated use of a priority of waste management methods, as specified in 75-10-804.

(4) "Postconsumer material" means only those paper products generated by a consumer that have served their intended end uses and have been separated or diverted from the solid waste stream.

(5) "Recycling" means all activities involving the collection of recyclable material, including but not limited to glass, paper, or plastic; the processing of recyclables to prepare them for resale; the marketing of recovered material for use in the manufacture of similar or different products; and the purchase of products containing recycled material.

(6) "Reuse" means using a product in its original form for a purpose that is similar to or different from the purpose for which it was originally designed.

(7) "Source reduction" means the design, manufacture, purchase, or use of a material or product, including packaging, to reduce its amount or toxicity before it enters the solid waste stream.

(8) "Special waste" means solid waste that has unique handling, transportation, or disposal requirements to ensure protection of the public health, safety, and welfare and the environment.

(9) "Waste reduction" means practices that decrease the weight, volume, or toxicity of material entering the solid waste management stream.

History: En. Sec. 2, Ch. 222, L. 1991; amd. Sec. 204, Ch. 418, L. 1995; amd. Sec. 1, Ch. 62, L. 2005.

75-10-803. Solid waste reduction goal and targets. (1) It is the goal of the state to reduce, through source reduction, reuse, recycling, and composting, the amount of solid waste that is generated by households, businesses, and governments and that is either disposed of in landfills or burned in an incinerator, as defined in 75-2-103.

(2) Targets for the rate of recycling and composting are:

(a) 17% of the state's solid waste referenced in subsection (1) by 2008;

(b) 19% of the state's solid waste referenced in subsection (1) by 2011; and

(c) 22% of the state's solid waste referenced in subsection (1) by 2015.

History: En. Sec. 3, Ch. 222, L. 1991; amd. Sec. 2, Ch. 62, L. 2005.

75-10-804. Integrated waste management priorities. It is the policy of the state to plan for and implement an integrated approach to solid waste management, which must be based upon the following order of priority:

(1) source reduction;

(2) reuse;

(3) recycling;

(4) composting; and

(5) landfill disposal or incineration.

History: En. Sec. 4, Ch. 222, L. 1991; amd. Sec. 3, Ch. 62, L. 2005.

75-10-805. State government waste reduction and recycling program. (1) In order to progress toward achieving the waste reduction targets identified in 75-10-803, each state agency, the legislature, and the university system shall:

(a) prepare a waste reduction and recycling plan to reduce the solid waste generated by state government. This plan must be submitted to the department and must include, at a minimum, provisions for the composting of yard wastes and the recycling of office and computer paper, cardboard, used motor oil, used oil filters, and other materials produced by the state for which recycling markets exist or may be developed.

(b) establish and implement a waste reduction and recycling program; and

(c) apply computer technology to reduce the generation of waste paper through:

(i) the use of electronic access systems;

(ii) the transfer of information in electronic rather than paper form; and

(iii) other applications of computer technology.

(2) The plan must be evaluated every 5 years and updated as necessary.

History: En. Sec. 5, Ch. 222, L. 1991; amd. Sec. 4, Ch. 440, L. 1997; amd. Sec. 4, Ch. 62, L. 2005.

75-10-806. State government procurement of recycled supplies and materials. (1) The department of administration shall write purchasing specifications that incorporate requirements for the purchase of materials and supplies made from recycled materials if the use is technologically practical and reasonably cost-effective. These requirements must be incorporated into the purchase of:

(a) paper and paper products;

(b) plastic and plastic products;

(c) glass and glass products;

(d) automobile and truck tires;

(e) motor oil and lubricants; and

(f) other materials and supplies as determined by the department of administration.

(2) It is the goal of the state that 95% of the paper and paper products used by state agencies, universities, and the legislature must be made from recycled material that maximizes postconsumer material content.

(3) The state shall, to the maximum extent possible, purchase for use by state agencies paper and paper products that contain postconsumer material rather than new material.

(4) To the extent practical, guidelines for the recycled material content of paper should be consistent with nationwide standards for recycled paper.

(5) The department and the department of administration shall establish a joint recycling market development task force. Task force membership must include but is not limited to representatives of the recycling industry, wholesalers, state agencies, and citizen and environmental organizations, as well as other interested persons. The task force shall:

(a) assist the department of administration in developing purchasing specifications as required in subsection (1);

(b) develop additional mechanisms for state government to develop markets for recycled materials;

(c) identify procurement barriers that discriminate against the purchase of supplies and products that contain recycled material; and

(d) develop recommendations for an informational program designed to educate state employees on how to reduce waste and recycle in the workplace.

History: En. Sec. 6, Ch. 222, L. 1991; amd. Sec. 271, Ch. 42, L. 1997.

75-10-807. Requirement to prepare and implement state solid waste management and resource recovery plan. (1) As a basis for developing an integrated waste management program and ensuring adequate disposal capacity, the department shall prepare, adopt, and implement a state solid waste management and resource recovery plan in accordance with 75-10-111 and this part.

(2) The plan must be comprehensive and integrated and must include at least the following elements:

(a) a capacity assurance element that identifies existing disposal capacity, estimates waste generation rates, and determines the disposal capacity needed for the future and that assesses the potential effect of interstate disposal on capacity;

(b) an element that incorporates federal regulations 40 CFR, parts 257 and 258;

(c) an element that identifies the role of each of the components of the integrated waste management priorities contained in 75-10-804;

(d) a technology assessment element that assesses the availability and practicality of alternative technologies for solid waste management;

(e) an education and public information element that identifies existing education and information programs and describes how the state will increase the awareness and cooperation of the public in environmentally safe solid waste management;

(f) a special waste and household hazardous waste element that identifies types and quantities of wastes that create special disposal problems and recommends methods for reducing, handling, collecting, transporting, and disposing of those wastes and that identifies existing and future strategies for managing those wastes;

(g) an element that identifies the needs of rural communities and management strategies to address those needs;

(h) an element that identifies mechanisms to ensure proper training of landfill operators; and

(i) a timeline and implementation strategy for each of the plan elements.

(3) The plan must be evaluated every 5 years and updated as necessary.

History: En. Sec. 7, Ch. 222, L. 1991; amd. Sec. 5, Ch. 62, L. 2005; amd. Sec. 4, Ch. 54, L. 2007.

75-10-111. State solid waste management and resource recovery plan -- hearings. The department shall adopt the solid waste management and resource recovery plan required in 75-10-104 and 75-10-807 according to the rulemaking procedures of the Montana Administrative Procedure Act under Title 2, chapter 4, part 3. The department shall prepare the plan in conjunction with local governments in the state, citizens, solid waste and recycling industries, environmental organizations, and others involved or interested in the management of solid waste. Within 3 days after the notice of proposed rulemaking to adopt the plan is published pursuant to Title 2, chapter 4, part 3, the department shall mail a copy of the notice and the proposed plan to the board of county commissioners in each county in the state, the governing body of every incorporated city or town in the state, any person responsible for the operation of a solid waste management system under the provisions of Title 75, chapter 10, parts 1 and 2, the governor, the environmental quality council, and any other interested person. During the period for receipt of comments on the proposed rulemaking concerning the plan, the department shall hold at least one public hearing.

History: En. 69-4016 by Sec. 6, Ch. 575, L. 1977; R.C.M. 1947, 69-4016; amd. Sec. 3, Ch. 54, L. 2007.

APPENDIX B: RESPONSE TO 2006 IWMP RECOMMENDATIONS
(Draft – Final response will be complete with input from advisory committee)

4.1 Source Reduction

Implement lifecycle cost purchasing for state and local governments. Lifecycle cost purchasing considers the costs of repair, maintenance, and replacement over the lifetime of a product in addition to the initial cost. It can even include the final disposal cost. This can be implemented by state and local governments and by businesses and consumers. Purchasing policies may need to be implemented or changed to focus on lifecycle cost. Education and resources that assist purchasing agents in making choices resulting in source reduction are needed as part of the effort to implement lifecycle cost purchasing.

State, local, and federal government employees in Montana have been offered Responsible Purchasing training seven times since 2006. One full day of training featured a nationally renowned speaker that spent considerable time on methods of evaluating lifecycle costs that are available to government purchasers. The other six half-day trainings also covered this topic.

Educate consumers about the benefits of source reduction. Consumers as a group and over a lifetime of purchasing do have influence. Manufacturers market their products by appealing to what they believe consumers want. An educated public can influence packaging and product availability by stating what they want, choosing to purchase products that last longer and have less packaging.

DEQ publishes an electronic newsletter, WasteP2, that highlights specific green products when appropriate and provides brief updates of interest to consumers, such as changes in packaging and manufacturing operations announced by businesses and corporations.

Educate businesses about the benefits of source reduction. This education should focus both on business practices used in selecting products and in their processes when providing goods and services to the public.

Six green purchasing training sessions were held across Montana over a two-year period. and included representatives from private business.

Encourage Pay-As-You-Throw pricing. This will provide an economic incentive for consumers, businesses and governments to reduce the amount of waste they generate. Pay-As-You-Throw pricing sets the cost for disposing of waste based on how much is

thrown away. A sliding scale can be used to provide some waste disposal at a low rate, then increase the rate as more waste is disposed of.

Pay-As-You-Throw training and case studies were presented during the last Waste Not Montana conference, as well as through several online seminars) held regionally and nationally. These webinars are announced in the WasteP2 newsletter.

Strengthen and support existing education programs for consumers and businesses.

DEQ has supported local education programs with both financial support and educational materials at diverse community events and trade shows.

4.2 Reuse

Increase the number of reuse areas at transfer facilities and landfills. Provide a place to set aside goods that can be reused. Promote the reuse area so the public is aware of it and will participate.

A bill clarifying municipal authority to administer reuse programs was introduced during the 2009 Montana Legislature, but did not pass.

Provide recognition of reuse programs. Reuse programs provide a good way to get a community involved in solid waste issues. Paint swaps and similar events encourage reuse and promote civic good will. Reuse programs can be promoted as "green" or good for the environment. While reuse of items sometimes has a stigma associated with it, there is a positive association with green programs.

Several Montana communities have seen business growth among thrift stores, and Habitat for Humanity operates several ReStores in the state.

Reuse events, such as paint exchanges, are not widely practiced by solid waste managers in Montana. The City of Helena offers a week-long latex paint collection in the spring, with the last day of collection set aside for trading or picking up another person's unwanted, usable paint for personal use. Bozeman holds a one-day annual paint exchange. Paint exchanges and similar events are announced in the DEQ WasteP2 electronic newsletter and listed on the DEQ website Recycling Calendar of Events.

Online reuse programs are increasingly in number and popularity, withswap and trade sites that promote the exchange of products between individuals and businesses. In addition, state and federal government websites provide links to some of the online programs that facilitate reuse, such as Freecycle.org, SwapBabyGoods.com, and Zwaggle.com.

Promote waste exchanges. Waste exchanges do not need to involve a central location; they can occur through newspapers, publications of civic organizations, community bulletin boards, and computer networks. Information about people who have useable products they do not want, and people who need products they do not have, should be listed and made available to the public. The two parties negotiate the exchange on their own. The Montana Materials Exchange operated by the MSU Extension service is a valuable resource in promoting useable materials that are available electronically for businesses and people who want to dispose of wastes or purchase used goods. The Montana Materials Exchange (MME) can be contacted at http://www.montana.edu/mme.

DEQ has worked with the MSU Extension Service and other organizations to promote waste exchanges by including suggestions, along with links, on the department website. Department staff encourage the use of MME by including it in handouts, mentioning it during educational presentations, and recommending it in response to inquiries seeking a market for unwanted materials.

Promote business and government reuse resources. The State of Montana offers surplus property to state agencies, local governments, nonprofits, and others. There are new businesses offering used construction materials. Awareness of these and other avenues to purchase used materials will lead to additional use of used materials.

DEQ has completed demonstration projects that showcase the reuse of pulverized glass and fly ash in a variety of constructive and decorative applications. Contractors and developers in Montana have participated in workshops on the recycling of construction and demolition waste. A private brokerage and recycling business provides service to independent thrift stores that divert large amounts of textiles from local landfills.

4.3 Recycling

Develop local markets for recyclable goods. Collaborate and form partnerships between private and public entities to create these local markets. Follow the example set for recycling glass in Montana, where private industry was able to use the glass as a substitute raw material providing a benefit to the local communities for recycling. This required changing state regulations to allow an alternative source of material that provided many benefits.

[NEED RESPONSE]

Provide economic incentives for recycling. Consider extending or making permanent the recycling tax credits and tax deduction. The recycling tax credit is for businesses that purchase equipment needed to process materials for recycling. The tax deduction is for persons who use recycled materials.

[NEED RESPONSE]

Support national legislation that requires manufacturers to take back their products at the end of their useful life. Montana does not have enough influence in the market to require anything of manufacturers. Yet, mandates similar to what is in place in other countries would have great impact on creating markets and making collection cost effective.

[NEED RESPONSE]

Provide opportunities to work together to increase opportunities for recycling. Collaboration and coordination of efforts between local governments, private and public landfills are necessary. These opportunities need to be both formal and informal, and include sharing both information and resources. For example, sharing equipment between sites and providing centralized sites for storage and processing may reduce costs and improve services. By working together, larger volumes of materials can be collected more efficiently and with lower cost to the communities.

[NEED RESPONSE]

Work collaboratively with other solid waste and recycling interests to identify barriers to recycling. Propose legislative solutions to those barriers when there is agreement of the affected parties.

[NEED RESPONSE]

Expand recycling opportunities through additional funding mechanisms with support of the solid waste industry. Increase solid waste fees to help pay for recycling programs. This was one way of increasing funding for recycling in Montana. It had conceptual support from many members of the task force, depending on how the funds would be set up and used. Collecting special fees and directing them back to local areas through grants or loans was of interest to many members. However, there was concern over the need to carefully set up a process to ensure that funds would be used as planned. Increasing solid waste fees would only be done with support of those involved, particularly the fee payers. Proposed programs for using solid waste fees would be coordinated through the Solid Waste Advisory Council.

4.4 Composting

Conduct highly visible demonstration projects using compost. Consider applications along roadsides and in public parks. Share the results of the demonstration projects

widely so that businesses, governments and citizens can see the benefits of the application.

The Montana Department of Transportation completed two research projects which evaluated the performance of compost on steep roadside slopes lacking productive topsoil. These projects verified that compost applications increase plant growth and inhibit erosion, and enabled MDT to develop recommendations addressing the amount of compost necessary to achieve increased plant growth and mitigation of wind erosion of applied compost. When the projects ended in April 2011, MDT established new standards that incorporate compost as a component of the mulch applied on reseeded slopes steeper than 3:1. Final reports and pictures are available on the MDT website (www.mdt.mt.gov/research/projects/env/organic_matter.shtml).

Increase markets for compost. Focus on markets that will provide an economic benefit to the company or local government that is producing the compost. Develop acceptance of the product by state and local governments for revegetation along roads and use in public parks. Work with businesses to specify compost to be used in landscaping applications. Develop additional markets for the application of compost in land reclamation.

State government agencies have provided an increased market for compost in Montana. MDT includes specifications for compost as a soil amendment for growing effective ground cover in areas with poor soils. DEQ remediation projects use compost during reclamation activities. Hundreds of thousands of cubic yards of compost are purchased by the Mine Waste Cleanup Program during reclamation of affected sites. Compost has been used on the Milltown Dam Project, Clark Fork Restoration, streamside tailings, and the reclamation of abandoned mine lands.

Enact specifications for compost. Review the standards that have been produced or used by different government or private organizations. Enact standards or specifications so that competition is fair in manufacturing compost and so the consumer has confidence in the product. Incorporate the ability for different products to be used for different applications.

As is typical of other states, Montana has not enacted regulations or standards specifically addressing the manufacture of compost or the final product. Nor has the federal government. EPA regulates compost when the feedstock includes biosolids or sewer sludges, and there are USDA requirements for compost labeled "organic" or used in production of organic food.

The DEQ Solid Waste Program (SWP) regulates compost operations by licensing solid waste management facilities. SWP oversees the proper operation and maintenance of these facilities to ensure that the environment is not negatively affected, primarily by odors and ground- or surface-water contamination. The

Montana Department of Agriculture (MDA) requires facilities distributing or manufacturing soil amendments in Montana to obtain a license, as well as requires registration of all fertilizer and soil amendment products sold in the state. That department is also responsible for inspecting facilities and testing products for quality assurance and accurate labeling. MDA requires reporting on the tons and types of fertilizer and soil amendments sold. A summary of that information is provided in an annual report available on its website (agr.mt.gov/licensing/commercial.asp#registration1).

Specifications for compost use in certain applications may be available from the U.S. Composting Council; other states, such as New York or California; *BioCycle Magazine*, and other industry-led initiatives. Many in the industry self-regulate through voluntary adherence to specifications and certifications available through the U.S. Composting Council, the Rodale Organic Garden Seal of Approval Program, and the Organics Materials Review Institute. Not all compost producers choose to spend the money and time required to receive a certification.

Educate the public about the benefits of compost. Include educational components on how to sort wastes, how to select compost, and what to expect from compost. Provide information on backyard composting and municipal composting that citizens can participate in. Also, provide education on the purchase and use of compost and the benefits of compost for the environment.

Educational activities promoting composting include Master Gardener Classes offered through the MSU Extension Service, presentations by DEQ staff, the Captain Compost and Gardens from Garbage programs in Great Falls (see next response for details), and the compost demonstration garden at the Flathead County landfill. A brochure available from DEQ explains the "recipe," or mix of ingredients necessary, for effective composting.

Educate businesses about the value of composting. Grocery stores and restaurants produce wastes that can provide reliable feedstock for composting operations. They need education, both factual and persuasive on the benefits of composting and how to participate in local composting opportunities. Contractors and landscapers may also need education on the benefits of using compost over traditional chemical fertilizers and on the opportunities for composting the waste materials from their businesses.

There is not a widespread initiative to convince business owners to begin a compost program to lower disposal costs; nonetheless, new programs have begun. The Salvation Army in Billings partnered with the Rimrock Foundation to create a food-scrap composting program that provides jobs and housing to former addicts. The Great Falls Community Food Bank partnered with Gardens from Garbage, a nonprofit program, to begin composting food scraps that can't be provided to the public. Gardens from Garbage also has a Captain Compost program that educates students

about composting in the classroom and assists schools with building compost bins and setting up food scrap diversion programs. The program began with two elementary schools and is expanding to include all Great Falls schools. Several other schools throughout Montana also have compost programs.

Develop partnerships to reach common goals. Private and public entities need to work together to increase composting. By combining efforts, available feedstock materials for composting can be increased, additional markets can be developed, and the amount of waste materials going into landfills can be reduced.

MDT partnered with the DEQ Solid Waste Progrm, the Montana State University Western Transportation Insitute, and the Reclamation Research Group in completing its composting research project. Deer and other animals killed by vehicles along Montana highways are now composted by MDT employees at eleven locations.

The Great Falls schools have successfully partnered with a local nonprofit to begin composting of food scraps.

4.5 Landfilling

Keep and maintain current level of landfill management with good design and siting. Operate the landfills on provable, sustainable science. Use best management practices and stay up to date as those practices evolve.
[NEED RESPONSE]

Divert household hazardous waste from landfills. Evaluate and implement programs that will provide ways to minimize the amount of household cleaners, pesticides, paints and solvents and similar materials that go into landfills. This may include education on alternative products and collection events, as well as other strategies to reduce and limit household hazardous wastes that need to be disposed of in landfills.
[NEED RESPONSE]

Minimize the number of landfills. The number of landfills in Montana has been reduced from 59 to 30 in the past 10 years. This number should remain fairly constant with efforts to manage the landfills carefully to prolong the life of existing landfills and protect human health and the environment, rather than build new landfills.
[NEED RESPONSE]

4.6 Incineration

Evaluate incineration very carefully. Incineration is an option to reduce the volume of material that needs to be landfilled. It also can offer a benefit in recovering energy from solid waste before it is disposed of as ash in a landfill. However, the air quality emissions

need to be carefully studied and the best available science needs to be applied in the design and operation of an incinerator.

[NEED RESPONSE]

5.1.1. Hazardous Waste by Conditionally Exempt Businesses

Provide a source of funding for collection of hazardous wastes generated by households and conditionally exempt small quantity generators. Consider increasing solid waste fees statewide and then funding collection events on a statewide basis or dispersing funds back to communities for collection events.

One way to help offset cost for rural communities is to work with the Department of Agriculture to combine its pesticide collection efforts with household hazardous waste collection events. This type of effort was demonstrated at the Ravalli County Household collection events, held in 2009.

5.1.3. Household Hazardous Wastes

Establish additional opportunities for collecting household hazardous waste. Increase the number of drop-off sites that are routinely open in communities. Increase the frequency of collection events throughout Montana.

Collection events have happened in every major city in Montana. Some communities have been funded one-time events by grants, and others have made their program permanent. Currently, there are permanent collection sites in Kalispell and Bozeman.

Coordinate collection events in several communities. Coordinated events could reduce the cost to individual solid waste districts or local governments by reducing costs. Transportation of hazardous wastes is one of the highest costs of the collection. Coordinated events could lead to higher volumes of materials collected at locations close enough to each other for a transporter to collect the wastes more efficiently.

An event in Ravalli County combined pesticide collection with household hazardous waste. The Montana Department of Agriculture provided funds for pesticide collection, and a DEQ grant helped offset the cost of the household hazardous waste.

[MORE?]

5.1.4. Mercury-containing Equipment

Educate solid waste managers and the public regarding recycling opportunities and responsibilities.

Since 2005, DEQ provides county sanitarians with collection buckets and spill-clean kits for free collection and recycling of mercury-containing thermostats, and covers the recycling fees for the mercury returned to DEQ through this program. The MSU Extension Service provides weatherization training for contractors working with the Montana Low-Income Weatherization Program to replace mercury-containing thermostats. The training includes safe management of the thermostats, and directs contractors to collect and return them to the Extension Service for recycling.

The importance of recycling mercury-containing equipment became more widely known as a result of the 2009 Montana legislation and an initiative to install dental amalgam separators in dental offices. An NGO organized a temporary task force which initiated outreach, education, and installation of equipment to help dentists remove mercury from their waste stream.

The Peaks-to-Prairies Pollution Prevention Information Center (P2Rx) educates the public and businesses regarding the purchase of nonmercury containing equipment and recycling older equipment containing mercury. P2Rx and DEQ both distribute information to the public regarding the energy efficiency benefits and proper disposal of compact fluorescent lightbulbs (CFLs). In addition, P2Rx does outreach to Montana schools, including tribal schools, and hospitals to encourage them to eliminate and recycle equipment and products containing mercury.

Partner with TRC to increase participation in their program and expand outreach to all parties designated in the Mercury-Added Thermostat Recycling Act.

The Thermostat Recycling Corporation (TRC) maintains contact with wholesalers and provides educational information for distribution to the public, contractors, and retailers. TRC correspondence explains the responsibilities of wholesalers in regards to the act and encourages participation in itsnational take-back program for a one-time fee of $25. TRC currently limits outreach in Montana to wholesalers, believing that, until the collection infrastructure is in place, it is premature to contact retailers and others.

Participate in national initiatives to safely manage mercury-containing equipment.

National initiatives implemented in Montana include Healthy and Safe Schools, Hospitals for a Healthy Environment (H_2E), low-income weatherization programs, a pilot retail take-back program for CFLs, the National Vehicle Mercury Switch Recovery Program, mercury fever thermometer exchanges, and installation of dental waste reduction equipment.

Support efforts by the Environmental Council of the States and the Quicksilver Caucus to encourage the federal government to manage surplus mercury supplies for the long run.

These two organizations argue that state governments do not have the resources or desire to manage surplus mercury supplies.

DEQ Director Richard Opper serves as president of the Environmental Council of the States (ECOS), whichprovides primary staff support for the Quicksilver Caucus. This is a coalition of the Association of Clean Water Administrators (ACWA), Association of State and Territorial Solid Waste Management Officials (ASTSWMO), National Association of Clean Air Agencies (NACAA), Association of State Drinking Water Administrators (ASDWA), and National Pollution Prevention Roundtable (NPPR). The caucus regularly provides feedback and suggestions to EPA and Congress regarding management of mercury in products.

Support environmental regulations or policy that require or encourage recovery of mercury. Mercury collected under these conditions is not subject to pressure from market prices.

The 2009 Montana Legislature passed the Mercury-Added Thermostat Collection Act (MCA. 75-10-15) requiring an industry-led collection and recycling program for thermostats only. Montana regularly participates in working groups such as ASTSWMO and the Quicksilver Caucus, and actively supports voluntary efforts by manufacturers to recover mercury.

<u>5.9 Batteries</u>

Label retail locations where batteries are sold. Montana law requires that there be a sign placed at every place oil is sold to inform consumers about where to take their used oil for recycling. Many of the stores selling used oil also sell batteries. DEQ could ask the retailers to post signs indicating where batteries can be recycled as well as where oil can be recycled.

Alkaline battery recycling is often cost-prohibitive, and DEQ is not aware of any established program for retailers. Lowe's, Home Depot, Radio Shack, Staples, Best Buy, Office Depot, cellular phone stores, and other retailers provide recycling for rechargeable batteries and cell phones through the Call2Recycle program. Some retailers, such as Staples, display large signs announcing their recycling program for batteries, cell phones, and other items they may accept.

Arrange convenient drop-off locations. DEQ can work with retailers to arrange for convenient drop-off locations for batteries and help advertise the locations for drop off.

Call2Recycle offers convenient drop-off locations, raises awareness of its program, and recruites more participating locations. Call2Recycle recently focused on recruiting healthcare agencies and institutes of higher education, and now generates more clicks on Earth911.org than any other resource listed.

DEQ promotional material directs people to Earth911.org to find recycling information. Call2Recycle promotional items are distributed to businesses during trade shows, outreach events, and DEQworkshops.

Form partnerships with other groups and agencies to reach goals. These partners may include large and small retail establishments, local governments, and recycling centers.

A significant number of retailers and other facilities in Montana participate in the Call2Recycle. After DEQ initially partnered with other state agencies to provide bins and information on battery recycling, several agencies began permanent programs to recycle batteries. When the Montana Innkeeper's Association (MIA) partnered with DEQ and the Office of Tourism in researching a green lodging programDEQ raised awareness of Call2Recycle amongst MIA members and distributed information about battery recycling in general.

5.4 Waste Tires

Ban whole tires from landfills. This would save landfill space. It would also eliminate or greatly reduce the problem of tires floating in landfills and finding their way to the surface.

NEED RESPONSE

Collect a fee on new tires that can be used to support tire recycling. Fees would go into a special fund that could be used to support recycling activities or the collection and proper disposal where recycling was not available. Funds could be used to look are larger facilities and to help pay for transportation of waste tires to those facilities.

NEED RESPONSE

Look for opportunities to recycle the tires locally. Consider chipping or grinding and use in roads, septic system aggregate, alternative landfill cover or other applications.

NEED RESPONSE

5.5 White Goods

Continue to educate consumers on the need to recycle white goods. While most appliances are recovered, some are still put into the waste stream and make it into the landfill. Consumers need to understand the value of the metals in the white goods. They also need to know who will collect the white goods from them and cost of disposing of Freon.

All of the Montana landfills are recycling white goods. Most consumers are aware of the ability to recycle white goods, but most want their old appliances to be reused rather than recycled. Therefore, educational focus is now on replacing old appliances with more energy-efficient models and recycling the old appliances.

5.6 Construction and Demolition

Educate consumers to request that materials from their homes and commercial buildings be recycled. Time needed to recycle materials is one of the difficulties to reducing demolition and construction waste. Consumers can influence this waste reduction by stressing the importance of it. Consumers can also sort and recycle the waste materials themselves in many cases.
NEED RESPONSE

Educate builders about the incentives available for recycling and for purchasing recycled materials. Builders may be able to benefit from tax credits for the purchase of equipment to collect and process recyclables. Builders or consumers may benefit from tax deductions for the purchase of recycled materials.

In 2009, DEQ provided day-long workshops for contractors in Kalispell, Missoula, Billings, Bozeman, and Great Falls. The trainings addressed skills to develop, manage, monitor, document, and promote a successful recycling program for construction and demolition debris. All of the participants received a three-year accreditation in Construction Waste Recycling and LEED construction waste management points.

Look for local solutions for reuse of building materials. Support reuse and recycling centers for building materials. Donate wood scraps to groups that could use them.
NEED RESPONSE

5.8 Automotive/Shop Waste, including Used Oil

Post information on where to recycle oil. Montana statute requires DEQ to design a sign telling where used oil can be recycled, and it requires retailers to display this sign. This program needs to be emphasized so that consumers have information available to them at the point of purchase of used oil.
NEED RESPONSE

Educate the Public about used oil. Educate the public about the environmental effects of disposing of used oil by pouring onto the ground or down storm drain. Focus education at technical schools and high school shop classes where people are learning to change oil.
NEED RESPONSE

Encourage responsible use of waste oil heaters. Waste oil heaters are appropriate for heating shops and other areas. Oil collected for burning in these heaters needs to be properly handled and stored.
NEED RESPONSE

Develop a collection process for used oil filters. Explore ways to collect used oil filters to recycle the remaining oil in the filters.
NEED RESPONSE

5.11 Electronic Scrap

Educate consumers on the importance of recycling electronics waste to increase individual actions to recycle and inform people about where they can recycle. Educating consumers could also help create consumer demand for take-back and recycling services from retailers. Consumer choice of retailers and manufacturers that support recycling could provide an incentive for retailers and manufacturers to provide recycling opportunities. Education should include point of sale information on where to recycle because the consumer is often purchasing a replacement for existing electronics and will have an item to dispose of.

The 2007 Montana Legislature amended 75-10-215 MCA, directingDE Q to conduct a public education campaign to provide information on recycling and safe disposal of electronic waste. DEQ now distributes recycling information through community collection events, public service announcements, newspaper articles, television interviews, an electronic newsletter, and its website. Since 2006, an increased number of retailers offer limited recycling services. Vann's, a regional electronics store, began a take-back program for electronics during this time, as did national retailers Staples, Best Buy, and Office Depot.

Encourage reuse of electronic equipment. Rapidly changing technology results in the need for new equipment for certain applications because of increased power in the electronics and the need to be compatible with other software and hardware systems. However, much of the electronics waste that is discarded still has useful life and may be beneficial to another group or individual. The state government program that provides used computers to schools should be continued and expanded. Other public and private entities should be encouraged to donate used computers, cell phones, and other electronic equipment to agencies and individuals that need them.

The DEQ website provides links to organizations, such as the Christina Foundation, which matches donors to people in the donor's area who are unable to purchase computersThere are also informal donation programs which are typically associated with a computer repair store or a motivated volunteer's efforts.

Partner with retailers for buy-back or recycling programs. State and local governments should partner with businesses to promote recycling. This could occur through advertising retailers who recycle on web sites and in publications provided to consumers about recycling. It could also be a focus of special events in a community. For example, America Recycles Day, National Pollution Prevention Week, and Earth Day all provide opportunities to promote recycling of electronics.

In 2006, DEQ partnered with Staples to offer two recycling collection events which charged $10 to accept any electronic. These events were part of pilot projects by Staples prior to launch of its national program, which takes back the types of electronics sold its stores for $10 per item. Local businesses continue to support community collection events in Montana through financial and in-kind donations. Billings, Bozeman, Great Falls, Helena, Kalispell, and Missoula all have collection events. Billings offers two events a year, and Bozeman and Missoula have year-round recycling opportunities for electronics. Sydney held its first event in 2005 and collected 8,500 pounds; its 2011 event collected more than 59,000 pounds. Templates and graphics developed by Sidney for itsthe "E-rase Your E-waste" campaign are now used by other Montana communities as well as across the nation. Since 2006, there have been over 50 collection events, including events in Big Timber, Dillon, Lake County and Libby. Combined with annual reports from recyclers, Montanan's have recycled over 2.2 million pounds of e-scrap.

Work with other states on national policies and laws. The recycling of electronics is not likely to be solved at a local level. Montana needs to join with other states and environmental interests to set up policies and incentives for national recycling of all types of electronics. This could include encouraging voluntary actions, providing incentives, and establishing regulatory requirements.

Montana and eight other EPA Region states participated in discussions about framework legislation, which was ultimately introduced to the Colorado Legislature, but not passed. DEQ also participated in national feedback sessions on draft federal legislation that ultimately resulted a law to require and fund a national study on electronics recycling.

Establish procurement guidelines to choose the best environmental option for electronic purchases. Procurement guidelines can encourage the purchase of electronics that will last longer by choosing features that are the best available or that can be upgraded easily. They can also be used to favor companies that offer recycling and/or have programs to ensure environmentally safe disposal. Procurement guidelines should be developed for both the public and private sectors.

All states that participate in the Western States Contracting Agreement, which includes Montana, require state government purchasing contracts to stipulate that computer equipment be rated bronze, silver, or gold under the EPEAT standard. Tools

for procurement officials and consumers to help them identify computers that both meet their technology needs and have areduced impact on the environment can be found on www.epeat.net.

5.12 for Printer or Toner Cartridges

Promote community efforts for collecting print cartridges for recycling or remanufacture.

Cartridges have been collected during community electronics collection events, and cartridge recycling fundraising opportunities have been marketed to schools during conferences and through newsletters. There is increased information available on the DEQ website regarding available recycling programs

Encourage the purchase of remanufactured cartridges. Lead the way with state agencies and their purchasing power.

The state's Recycling and Market Development Task Force, organized by DEQ, invited state employees to a workshop on ink and toner cartridge recycling in 2008. Two professionals from firms that sell virgin and recycled cartridges presented information on the products available and one provided a tour of his small cartridge recycling business. The workshop included a discussion about the problems with using recycled cartridges, user perceptions, quality improvements, and meeting manufacturer specifications. Recycling and purchasing recycled cartridges appears to be a widespread practice among state agencies.

5.13 Animal Waste

State agencies continue to develop contingency plans to safely and quickly dispose of animal wastes in the event of an outbreak of threatening animal disease.

The Montana Department of Livestock develop these plans. To state maintains an air curtain incinerator that can be use to dispose of large numbers of animals and related task to decontaminate the environment of an animal disease.

Ensure landfill operators receive adequate training to handle animal waste.

DEA provides yearly Landfill Managers training to address specific topics of various wastes.

Chapter 6.Industrial Waste Recommendations

Examine all exemptions for waste not going to landfills. Study the issue and determine the need for changes in industrial waste laws.

Currently oil,gas, mining and electric power generation are all exempted in Montana. These industries can manage their wastes on site. Montana uses the Beneficial Use Determination (BUD) process, administered by the DEQ Solid Wast Program and guided by this waste management plan The program evaluates each BUD request individually.

Examine the agriculture exemption and the cumulative effect.

Agriculture exemptions are present in every level of government. These exemptions will have to be changed at a national level before the state or local governments can proceed with any program to reduce agricultural waste.

Examine the quantity and impacts of ash from combustion processes.

Currently, reuse of coal-combustion byproducts (CCBs) is not specifically authorized under Montana law or regulations, although fly ash may be substituted for up to 25% of portland cement in connection with monitoring well construction (MONTANA ADMIN.R.36.21.801(39)(h)). DEQ encourages the reuse of CCBs, especially in construction projects, and provides referrals to companies wishing to reuse CCB's.

At the present time, Montana has six permitted coal-fired utilities that generate approximately 1.3 million tons of CCBs per year, an estimate based on direct communications with the permitted generating facilities. Fly ash and bottom ash comprise the bulk of the 1.3 million tons generated, with only about 300,000 tons generated as scrubber slurry.

Classification of fly ash from coal combustion is based upon its chemical composition as either Class C or Class F. Most of the fly ash generated in Montana is Class C, with approximately 2,000 tons of Class F fly ash is generated on an annual basis.

APPENDIX C: WASTE DIVERSION SUMMARIES, 2005-2010

2005 Recycling Summary

This summary is a review of all recycled materials diverted from Montana landfills in 2005. The data presented in this summary on total recycled materials was obtained by reviewing permit renewal applications from all state licensed solid waste management facilities including landfills, transfer facilities, compost operations and resource recovery facilities. Data from non-licensed recycling organizations businesses and end processors was obtained through voluntary participation in the 2005 Montana Recycling Survey.

Summary of Data	***Total Tons***	***Percentage of Total***
Solid Waste Generated:	1,457,121	100%
Landfilled Waste:	1,184,198	81.3%
Incinerated Waste:	0	0%
Recycled Commodities:	166,316	11.4%
Other Materials:	42,083	2.9%
Composted Material:	64,524	4.4%
Total Diversion Rate:	**272,923**	**18.7%**

The EPA's recyclable commodities list was used to determine the recycling rate.

Commodities

- Aluminum Cans
- Plastics
- Steel Cans
- Paper
- Mixed Metals
- Corrugated Cardboard
- Ferrous Scrap Metal
- Glass

Other Materials

- Food Scrap
- Yard Trimmings
- Fly Ash
- Construction/Demolition
- Construction
- Batteries
- Mixed Recyclables
- Other Recyclables
- Carpet
- Electronics
- Sewage Sludge

This data has been used with conjunction with the National Recycling Coalition's Environmental Benefits Calculator. The calculator generates estimates of environmental benefits based on the number of tons of specified materials recycled, landfilled and incinerated in Montana. The calculator yields detailed information in the following areas:

- Reductions in Greenhouse Gas Emissions through Recycling
- Energy Savings from Recycling
- Life Cycle Stage Comparisons
- Air Emissions and Waterborne Wastes
- Select National Resource Savings
- Number of Trees Saved

Review of Montana Recycled Materials Converted by Environmental Benefits Calculator

Reductions in Greenhouse Gas Emissions through Recycling	
Greenhouse Gas Emissions Associated with Recycling (MTCE)	-243,453.0
Greenhouse Gas If All Landfilled (MTCE)	-3,671.0
Net Greenhouse Gas Emissions from Recycling Compared To Landfilled (MTCE)	-239,761.0
Greenhouse Gas Reduction in Passenger Cars Equivalent (Number of cars off the road per year)	-180,930.0

Energy Savings from Recycling	
Net Energy from Recycling Compared to Disposal (Millions BTU)	-10,084,661.0
Energy Savings in Per Household Equivalent (Number of households per year)	-96,931.0

Life Cycle Stage Comparisons	
Energy Used During Recycling and Processing	139,349.0

(Millions BTU)	
Energy Used Waste Collection and Landfill	51,882.0
Energy Used During Waste Collection, Processing and Incineration	180,921.0
Energy Used for State's Average Mix of Landfill and Incineration	51,882.0
Air Emissions and Waterborne Wastes	
Reduced Emissions Due to Recycling (tons)	206,325.4
AIR EMISSIONS	
Reduced Emissions Due to Recycling (tons)	768.1
WATERBORNE WASTES	
Total (Excluding CO2 and Methane)	4,690.1
Select National Resource Savings	
Total Tons Resources Saved	25,569.0
Number of Trees Saved	
From recycling newsprint, mixed paper and office paper	164,666.0

In summary, there are many ways to express the resource savings that recycling effects. Even when considering energy used to recycle, the savings in resources rationalizes the value of recycling. As Montana recycling statistics increase, the efficiency will only become more evident. For more information on recycling visit the DEQ website at: www.deq.mt.gov/recycle/index.asp.

Recycling Rates for the State of Montana

2002 15.0%
2003 15.0%
2004 15.0%
2005 18.7%

State Government's Recycling Efforts:
From January 1, 2005 thru December 31, 2005 the totals are as follows:

Cardboard -	29.6 tons
Newspaper -	49.8 tons
Office Pack -	255.1 tons
Phone books -	1.7 tons
Magazines -	4.0 tons
Aluminum -	.2 tons

Prices for all recycled materials tend to follow expansions and contractions in overall demand for manufactured goods. At the same time, specific trends in each industry such as paper, cardboard, steel, aluminum, or plastics can push prices for the different recycled materials in opposite directions. These factors combined with the many market development projects and continued education through out the state, have helped to make recycling the new buzz word.

Another industry trend that is responsible for helping push the recycling market is the high price of petroleum. We believe the recycled materials percentage is up over 2004 due to the increase in petroleum price pushing the plastics market. With new material being made from oil or natural gas, using recycled plastic is more cost efficient for this industry. This has helped create a market for Montana's recycled plastics.

Also, the shortage of raw materials for the metals has pushed the pricing to make recycling scrap metal cost efficient as well. The increase in compost material over the 2004 figure is largely due to processors responding to increasing demands for their product. The increased market demand for compost is due to market development projects such as Montana Department of Transportation's highway re-vegetation project and land reclamation projects coordinated by diverse agencies. The local market has caused higher demand for compost and has affected consumer confidence in using local compost. Continued education and credibility of the product has given Montana a stable market for this recycled product.

2006 Recycling Summary

This summary is a review of all recycled materials diverted from Montana landfills in 2006. The data presented in this summary on total recycled materials was obtained by reviewing permit renewal applications from all state licensed solid waste management facilities including landfills, transfer facilities, compost operations and resource recovery facilities. Data from non-licensed recycling organizations businesses and end processors was obtained through voluntary participation in the 2006 Montana Recycling Survey.

Summary of Data	***Total Tons***	***Percentage of Total***
Solid Waste Generated:	1, 461,542	100%
Landfilled Waste:	1,189,539	81.4%
Incinerated Waste:	0	0
Recycled Commodities:	194,904.30	13.3%
Other Materials:	33,935.11	2.3%
Composted Material:	43,163.14	3.0%
Total Diversion Rate:	**272,003.0**	**18.6%**

The EPA's recyclable commodities list was used to determine the recycling rate list.

Commodities list is as follows:

Aluminum Cans	Plastics
Steel Cans	Paper
Mixed Metals	Corrugated Cardboard
Ferrous Scrap Metal	Glass

Other Materials

Food Scrap	Yard Trimmings
Fly Ash	Construction/Demolition
Construction	Batteries
Mixed Recyclables	Other Recyclables
Carpet	Electronics
Sewage Sludge	

This data has been used with conjunction with the National Recycling Coalition's Environmental Benefits Calculator. The calculator generates estimates of environmental benefits based on the number of tons of specified materials recycled, landfilled and incinerated in Montana. The calculator yields detailed information in the following areas:

- Reductions in Greenhouse Gas Emissions through Recycling
- Energy Savings from Recycling
- Life Cycle Stage Comparisons
- Air Emissions and Waterborne Wastes
- Select National Resource Savings
- Number of Trees Saved

Review of Montana Recycled Materials Converted by Environmental Benefits Calculator

Reductions in Greenhouse Gas Emissions through Recycling

Greenhouse Gas Emissions Associated with Recycling	-270,128
Greenhouse Gas If All Landfilled	-5,185
Net Greenhouse Gas Emissions from Recycling Compared To Landfilled	-275,314
Greenhouse Gas Reduction in Passenger Cars Equivalent	-207,741

Energy Savings from Recycling

Net Energy from Recycling Compared to Disposal (millions BTU)	-12,061,948
Energy Savings in Per Household Equivalent	-114,657

Life Cycle Stage Comparisons

Energy Used During Recycling and Processing (millions BTU)	163,501
Energy Used Waste Collection and Landfill	60,874

Energy Used During Waste Collection, Processing and Incineration	212,278
Energy Used for State's Average Mix of Landfill and Incineration	60,874

Air Emissions and Waterborne Wastes

Reduced Emissions Due to Recycling (tons) AIR EMISSIONS	242,085.5
Reduced Emissions Due to Recycling (tons) WATERBORNE WASTES	901.3
Total (Excluding CO2 and Methane)	5,503.0

Select National Resource Savings

Total Tons Resources Saved	24,709

Number of Trees Saved

From recycling newsprint, mixed paper and office paper	197,176.

In summary, there are many ways to express the resource savings that recycling effects. Even when considering energy used to recycle, the savings in resources rationalizes the value of recycling. As Montana recycling statistics increase, the efficiency will only become more evident. For more information on recycling visit the DEQ website at: www.deq.mt.gov/recycle/index.asp

Recycling Rates for the State of Montana

2003 15.0%

2004 15.0%

2005 18.7%

2006 18.6%

State Government's Recycling Efforts

From January 1, 2006 thru October 31, 2006 the totals are as follows:

Cardboard - 35,674 pounds
Newspaper - 73,581 pounds
Office Pack - 338,241 pounds
Phone books - 2,476 pounds
Magazines - 1174 pounds
Aluminum - 172 pounds

Note:

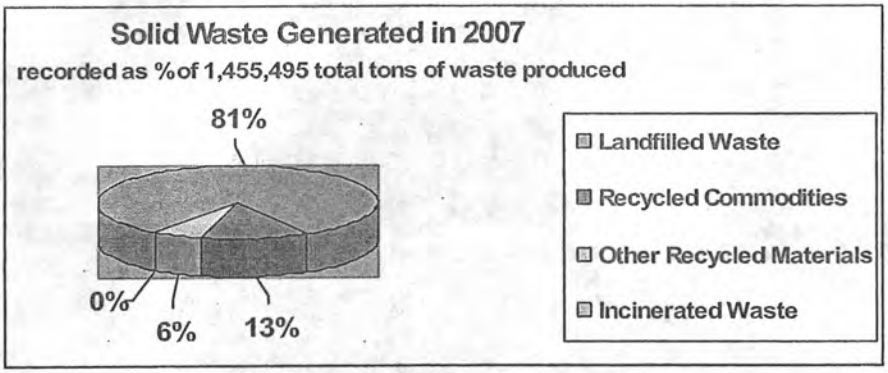
Prices for all recycled materials tend to follow expansions and contractions in overall demand for manufactured goods. At the same time, specific trends in each industry be it paper, cardboard, steel, aluminum, or plastics can push prices for the different recycled materials in opposite directions. These factors combined with the many market development projects and continued education through out the state, have helped to make recycling the new buzz word.

2007 Recycling Summary

This summary is a review of all recycled materials diverted from Montana landfills in 2007. The data presented in this summary on total recycled materials was obtained by reviewing permit renewal applications from all state licensed solid waste management facilities including landfills, transfer facilities, compost operations and resource recovery facilities. Data from non-licensed recycling organizations businesses and end processors was obtained through **voluntary participation** in the 2007 Montana Recycling Survey. *(* Important to note that 5 major participants did not report recycling numbers for the 2007 survey)*

In the United States, we generated approximately 254 million tons of MSW in 2007. Excluding composting, the amount of MSW recycled increased to 63.3 million tons, an increase of 1.9 million tons from 2006. MSW generation in 2007 per person per day was 4.62 pounds. The recycling rate per person per day for 2007 is 1.54 pounds. In Montana we generated 1.4 million tons of MSW in 2007 and based on 2007 Census population figures of 957,861 Montanan's generated 1.51 pounds of MSW and recycled .3 pounds per person per day.

Summary of Data	***Total Tons***	***Percentage of Total***
Solid Waste Generated	1,455,595	100%
Landfilled Waste:	1,188584	82.1%
Incinerated Waste:	0	0
Recycled Commodities	182,064	12.6%
Other Materials:	84,947	5.9%
Total Diversion Rate:	**267,011**	**18.34**



The EPA's recyclable commodities list was used to determine the recycling rate list.

Commodities list is as follows:

Aluminum Cans	Plastics
Steel Cans	Paper
Mixed Metals	Corrugated Cardboard
Ferrous Scrap Metal	Glass

Other Materials

Food Scrap	Yard Trimmings
Fly Ash	Construction/Demolition
Organics	Batteries
Mixed Recyclables	Other Recyclables
Carpet	Electronics
Sewage Sludge	House Hold Hazardous Waste

This data has been used with conjunction with the National Recycling Coalition's Environmental Benefits Calculator. The calculator generates estimates of environmental benefits based on the number of tons of specified materials recycled, landfilled and incinerated in Montana. The calculator yields detailed information in the following areas:

- Reductions in Greenhouse Gas Emissions through Recycling
- Energy Savings from Recycling
- Life Cycle Stage Comparisons
- Air Emissions and Waterborne Wastes
- Select National Resource Savings
- Number of Trees Saved

Review of Montana Recycled Materials Converted by Environmental Benefits Calculator

<u>Reductions in Greenhouse Gas Emissions through Recycling</u>

Greenhouse Gas Emissions Associated with Recycling	-142,325
Greenhouse Gas If All Landfilled	5,309
Net Greenhouse Gas Emissions from Recycling Compared To Landfilled	-147,634
Greenhouse Gas Reduction in Passenger Cars Equivalent	-111,399

Energy Savings from Recycling

Net Energy from Recycling Compared to Disposal (millions BTU)	-5,382,627
Energy Savings in Per Household Equivalent	-51,166

Life Cycle Stage Comparisons

Energy Used During Recycling and Processing (millions BTU)	146,613
Energy Used Waste Collection and Landfill	54,586
Energy Used During Waste Collection, Processing and Incineration	190,352
Energy Used for State's Average Mix of Landfill	54,586

Air Emissions and Waterborne Wastes

Reduced Emissions Due to Recycling (tons)	217,080.0
AIR EMISSIONS	
Reduced Emissions Due to Recycling (tons)	808.2
WATERBORNE WASTES	
Total (Excluding CO2 and Methane)	4,934.6

Select National Resource Savings

Total Tons Resources Saved	199,433

Number of Trees Saved

From recycling newsprint, mixed paper and office paper 197,176.

In summary, there are many ways to express the resource savings that recycling effects. Even when considering energy used to recycle, the savings in resources rationalizes the value of recycling. As Montana recycling statistics increase, the efficiency will only become more evident. For more information on recycling visit the DEQ website at: www.deq.mt.gov/recycle/index.asp

Recycling Rates for the State of Montana

2003 15.0%

2004 15.0%

2005 18.7%

2006 18.6%

State Government's Recycling Efforts

From January 1, 2006 thru October 31, 2006 the totals are as follows:

Cardboard - 35,674 pounds
Newspaper - 73,581 pounds
Office Pack - 338,241 pounds
Phone books - 2,476 pounds
Magazines - 1174 pounds
Aluminum - 172 pounds

Note:

Prices for all recycled materials tend to follow expansions and contractions in overall demand for manufactured goods. At the same time, specific trends in each industry be it paper, cardboard, steel, aluminum, or plastics can push prices for the different recycled materials in opposite directions. These factors combined with the many market development projects and continued education through out the state, have helped to make recycling the new buzz word.

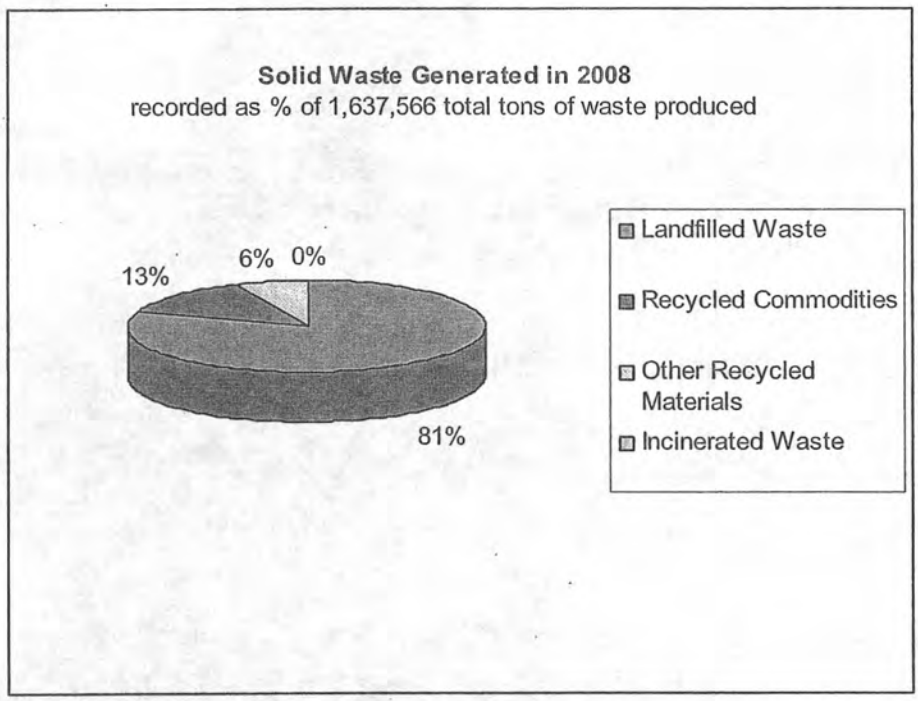
2008 Recycling Summary

This is a summary of the materials diverted from Montana landfills in 2008. The tonnage reported was obtained by reviewing Annual License Renewal applications from Montana licensed solid waste management facilities including landfills, transfer facilities, compost operations and resource recovery facilities. Data from non-licensed recycling organizations, businesses, and end processors was obtained through voluntary participation in the 2008 Montana Recycling Survey, and it's important to note that several major recyclers did not report the tonnages that they recycled in 2008.

The Environmental Protection Agency reports that In the United States in 2008, approximately 250 million tons of Municipal Solid Waste (MSW) was generated. Excluding composting, the amount recycled was 61 million tons. During 2008 4.5 pounds of MSW was generated per person each day in the US, a slight decrease over 2007. The recycling rate per person per day was 1.5 pounds.

In Montana 1.3 million tons of MSW were generated in 2008. Based on the census population figure of 967,440, Montanans generated 9.3 pounds of waste per person each day, and recycled 1.82 pounds per person per day, including materials diverted for composting.

Summary of Data	***Total Tons***	***Percentage of Total***
Solid Waste Generated:	1,637,556	100%
Landfilled Waste:	1,317,324	80.4%
Incinerated Waste:	0	0
Recycled Commodities:	216,278	13.2%
Other Materials:	103,953	6.4%
Total Diversion Rate:	320,231	19.6%



The National Recycling Coalition's Environmental Benefits Calculator was used to determine the percentage of material recycled in Montana, and the environmental benefits of the material recycled.

The recyclable commodities used for the Montana calculations are:

Aluminum Cans	Plastics
Steel Cans	Mixed Metals
Ferrous Scrap Metal	Glass
Office Paper	Newspaper
Mixed Paper	Corrugated Cardboard

Other diverted materials included in the Montana calculations are:

Yard Waste	Landscape Material
Manure	Agriculture Wastes
Sewage Sludge	Road Mortalities (composted by MDT)
Fly Ash	Construction/Demolition
Batteries	Electronics

The calculator provides detailed information in the following areas:

- Reductions in Greenhouse Gas Emissions through Recycling
- Energy Savings from Recycling

- Life Cycle stage Comparisons
- Air Emissions and Waterborne Wastes
- Select National Resource Savings
- Number of Trees Saved

Review of Montana Recycled Materials Calculated by the Environmental Benefits Calculator

<u>Reductions in Greenhouse Gas Emissions through Recycling</u>	
Greenhouse Gas Emissions Associated with Recycling	-193,132
Greenhouse Gas if all Landfilled	7,908
Net Greenhouse Gas Emissions from Recycling Compared to Landfilled	-201,040
Greenhouse Gas Reduction in Passenger Cars Equivalent	-151,697
<u>Energy Savings from Recycling</u>	
Net Energy from Recycling Compared to Disposal (millions BTU)	-8,084,894
Energy Savings in Per Household Equivalent	-76,853
<u>Life Cycle Stage Comparisons</u>	
Energy Used During Recycling and Processing (millions BTU)	181,241
Energy Used Waste Collection and Landfill	67,479
Energy Used Waste Collection, Processing And Incineration	235,311
Energy Used for State's Average Mix of Landfill	67,479

Air Emissions and Waterborne Wastes

Reduced Emissions Due to Recycling (tons) AIR EMISSIONS	268,351.6
Reduced Emissions Due to Recycling (tons) WATERBORNE WASTES	999.1
Total (Excluding CO_2 and Methane)	6,100.1

Select National Resource Savings

Total Tons Resources Saved	223,252

Number of Trees Saved

From recycling newsprint, mixed paper and office paper	329,263

In summary, there are many ways to express resource savings through recycling. Even when considering energy used to recycle, the savings in resources rationalizes the value of recycling. As Montana recycling statistics increase, the efficiency will only become more evident. For more information on recycling, visit the DEQ website at: www.deq.mt.gov/recycle/index.asp

Recycling Rates for the State of Montana

2003	15.0%
2004	15.0%
2005	18.7%
2006	18.6%
2007	18.3%
2008	19.6%

The increase in the percentage recycled in 2008 can be attributed mainly to an increase in scrap metal and organic materials recycled.

During 2008 State Government recycled the following amounts:

Cardboard	31,029 lbs.
Shredded Paper	18,686 lbs.
Newsprint	59,327 lbs.
Office Paper	296,171 lbs.

State of Montana

2009 Recycling and Waste Diversion Summary

Montana's Integrated Waste Management Plan

The Montana Integrated Waste Management Act (75-10-803 MCA), directs Montana to reduce the volume of solid waste that is disposed of in landfills. The Act requires a written plan for managing wastes in accordance with the Act.

The Act describes a strategy for integrated solid waste management and sets the following targets to increase rates of recycling and diversion in Montana:

(a) 17 percent of the state's solid waste by 2008;
(b) 19 percent of the state's solid waste by 2011;and
(c) 22 percent of the state's solid waste by 2015.

The integrated solid waste management strategy is based on a hierarchy of prioritized approaches to managing waste. These approaches, in order of priority, are: source reduction, reuse, recycling, and composting. The Department of Environmental Quality (DEQ) assists communities, solid waste facilities, and residents with their waste reduction strategies.

Montana's recycling and diversion rates over the past seven years are as follows:

Calendar Year	Recycled/Diverted*	Calendar Year	Recycled/Diverted*
2003	15.0%	2007	18.3%
2004	15.0%	2008	19.6%
2005	18.7%	2009	19.1%
2006	18.6%		

** The Recycled/Diverted rate is likely higher than calculated since some companies that handle recyclable materials in Montana do not report their tonnages.*

Benefits of Recycling

Recycling generates significant economic benefits for communities. Recycling employs workers from a range of skill levels in a variety of jobs from materials handling, processing, and shipping to high-skilled, high-quality product manufacturing. The drive to more efficiently process recycled materials and to develop new products and markets spurs innovation, a key to long-term economic growth. Investment in recycling companies and equipment filters through the local economy and contributes to economic growth.

Equally important are the social and environmental benefits of recycling.. Recycling promotes a more sustainable use of natural resources. Recycling activities across the state promote community development while conserving public resources. Landfills last longer and fewer new ones are required. Pollution is prevented, energy is saved, and less greenhouse gas is emitted.

The National Recycling Coalition's (NRC) Environmental Benefits Calculator computed that the following benefits were achieved by the materials diverted from Montana landfills in 2009.

- Greenhouse gas was reduced by the equivalent of 133,438 passenger cars being removed from the roads.

- A total of 6.9 million BTU's were saved, the equivalent of 65,382 households being removed from the power grid.
- 197,643 trees were saved by the recycling of newsprint, mixed paper, and office paper.

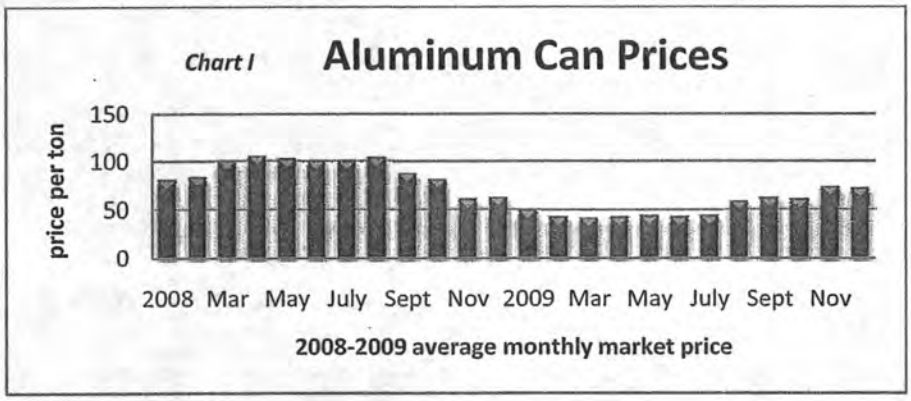
In addition the following *natural resource* savings were calculated:

Natural Resources Saved	
Tons of Ferrous Steel Recycled	**87,838**
Pounds of iron ore saved per ton steel recycled	**2,500**
Pounds of coal saved per ton steel recycled	**1,400**
Pounds of limestone saved per ton steel recycled	**120**
Tons iron ore saved	**109,798**
Tons coal saved	**61,487**
Tons lime stone saved	**5,270**

As demonstrated by the results of the NRC calculations, there are numerous ways to express resource savings through recycling. Recycling saves energy otherwise used to mine and process raw materials. As Montana recycling statistics increase, the energy efficiencies become more evident. Visit the NRC site at: www.crra.com/nrcfiles/calculator/coverletter.html

The Economy in 2009

The weakened economy in 2009 affected the amount of solid waste recycled during the year. Prices paid for recycled materials declined dramatically in the fourth quarter of 2008, and remained weak throughout most of 2009. Recycling rates in Montana softened accordingly. ***Chart I*** illustrates the national and international market price decline for aluminum cans in the fourth quarter of 2008, and the start of price recovery towards the end of 2009. Other recycled commodities saw similar price drops. *(Price data courtesy of Resource Recycling Magazine.)*



The market price paid for recyclable materials began to recover by the end of 2009. Unfortunately, several recycling business in Montana were forced to close during 2009 and are likely not be in a position to re-open. Much of the material previously collected for recycling ultimately ended up in landfills. DEQ has, and continues, to work with affected communities to re-build and improve the recycling infrastructure.

2009 Recycling and Waste Diversion Summary

The data used for the 2009 Summary was collected from the Annual License Renewal applications completed by solid waste management facilities licensed to operate in Montana. Licensed facilities include landfills, transfer facilities, compost operations, and resource recovery facilities. Non-licensed solid waste facilities include recycling businesses, end processors, and brokers. Recycling information from these non-licensed facilities is obtained through an annual Montana Recycling Survey. Response to the survey is *voluntary*, and it's important to note that several businesses chose *not* to report their 2009 recycling information. In addition, the information from some retail stores — particularly "big box" stores that recycle cardboard and plastic — is not included because this information is not currently available on a state level. Consequently, the recycling numbers reported are clearly more conservative than the amounts actually recycled.

The materials diverted from Montana landfills are sorted into two categories for reporting purposes — "Recycled Commodities" and "Materials Diverted for Beneficial Use." The materials contained in each category are listed below.

Recycled Commodities

- Office paper, mixed paper, newspaper, magazines, catalogs, telephone directories
- Corrugated cardboard, chipboard or boxboard
- Plastic
- Glass
- Aluminum Cans
- Ferrous scrap metal, mixed metals, steel cans, white goods

Materials Diverted for Beneficial Use

- Organic material: yard and landscape waste, manure, agriculture wastes, sewage sludge, animal highway mortalities (composted by MDT)
- Carpet, textiles
- Fly ash
- Aggregate
- Construction/demolition debris
- Electronic waste, batteries
- Automotive liquid

Montana's Recycling Data

In Montana 1.7 million tons of Municipal Solid Waste (MSW) was generated during 2009. Based on the census population figure of 967,440, every Montana resident landfilled 7.76 pounds, recycled 1.0 pound, and diverted .8 pounds of solid waste every day. The Environmental Protection Agency (EPA) reports that in 2008, — the most recent information available — the national average for each person is 4.5 pounds of waste generated and 1.5 pounds recycled each day. The amount of waste generated per day in Montana is higher — and the amount recycled is lower — than the EPA's national average. However, Montana's recycling rates are comparable to the other states in the Rocky Mountain region. The region is rural, has less recycling infrastructure, and is distant to markets and seaports. The EPA report can be seen at: http://www.epa.gov/wastes/nonhaz/municipal/pubs/msw2008rpt.pdf.

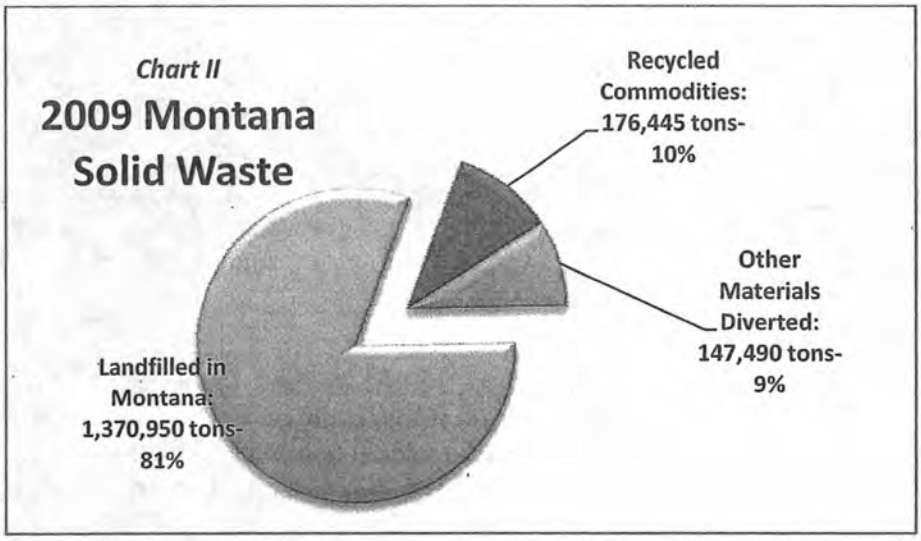
Montana's state government offices participated in recycling programs. During 2009, state offices contributed by recycling a total of 465 tons of paper and cardboard. This is more than double the 203 tons reported in 2008. Many state offices also have collection containers for aluminum cans and plastic bottles; however, these products are not handled as a state service, but rather on an employee level.

Table 1 sorts into three categories the waste that was generated in Montana during 2009– waste that was landfilled, commodities that were recycled, and material that was diverted in some manner from landfills (e.g., composting).

TABLE 1.				
2009 Montana Data	*Tons*		*Percentage of Total*	
Amount of Solid Waste ***Landfilled***		**1,370,950**		**80.9%**
Amount of Solid Waste ***Recycled***	**176,445**		**10.4%**	
Diverted from Landfill	**147,490**		**8.7%**	
Total Amount Recycled and Diverted		**323,935**		**19.1%**
Total Solid Waste Generated in Montana		**1,694,885**		**100.0%**

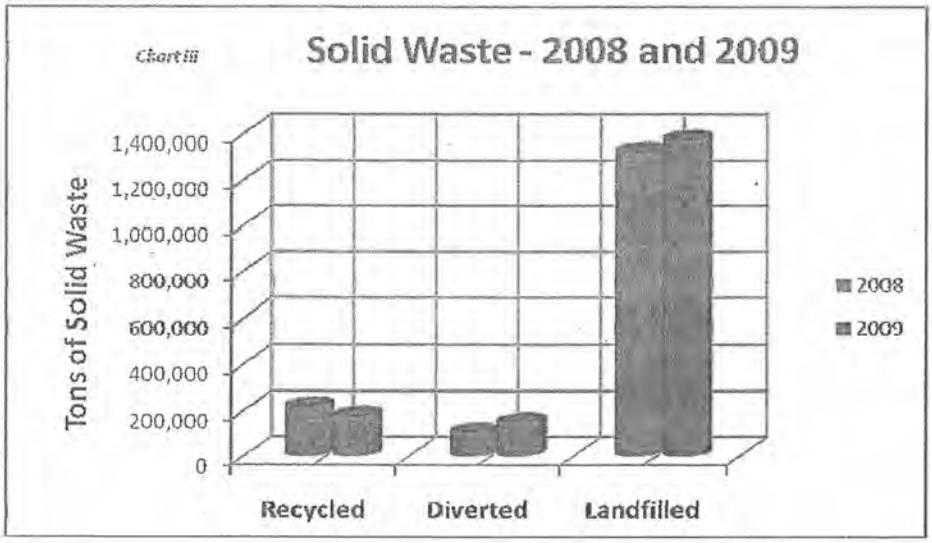
Chart II shows the breakdown of the state's solid waste. During 2009, approximately 81 pecent of the solid waste generated in Montana was sent to landfills, and 19 percent was recycled or diverted from the landfill.

BioCycle Magazine, in collaboration with Columbia University, conducts a biennial *State of Garbage in America* report. The 2008 reports shows the Rocky Mountain region — Montana, Idaho, Wyoming, Utah, Colorado, Arizona, and New Mexico — landfilled 88 percent of the total waste stream. The remianing 12 percent of the wastestream was recycled or diverted for beneficial use. www.jgpress.com/archives/_free/002191.html



As previously mentioned, the drop in the recycling market prices during the last quarter of 2008 and the beginning of 2009 affected the amount of material recycled in Montana. As shown in Chart III, the amount of materials recycled during 2009 decreased by 39,833 tons as compared to 2008.

The material not recycled was landfilled, which increased the amount landfilled from 2008 to 2009 by 53,626 tons. The "Other Materials Diverted" in Montana increased by 43,537 tons. This can be partly attributed to the growth in wood and yard waste diversion at landfill and transfer station sites. Also, in 2009 there was a significant amount of concrete, asphalt, and fly ash diverted from landfills.



In summary, recycling is effectively working in Montana despite the poor economic climate. Montana's recycling rate is generally increasing, and a variety of resources are being saved by the activities of those recycling in our state. For more information on recycling, and to read case studies on DEQ recycling/diversion projects, visit the DEQ website at www.recycle.mt.gov.

State of Montana

2010 Recycling and Waste Diversion Summary

Montana's Integrated Waste Management Plan

The Montana Integrated Waste Management Act (75-10-803 MCA), directs Montana to reduce the volume of solid waste that is disposed of in landfills. The Act requires a written plan for managing wastes in accordance with the Act.

The Act describes a strategy for integrated solid waste management and sets the following targets to increase rates of recycling and diversion in Montana:

(a) 17 percent of the state's solid waste by 2008;
(b) 19 percent of the state's solid waste by 2011;and
(c) 22 percent of the state's solid waste by 2015.

The integrated solid waste management strategy is based on a hierarchy of prioritized approaches to managing waste. These approaches, in order of priority, are: source reduction, reuse, recycling, and composting. The Department of Environmental Quality (DEQ) assists communities, solid waste facilities, and residents with their waste reduction strategies.

Montana's recycling and diversion rates during the past eight years are as follows:

Calendar Year	Recycled/Diverted*	Calendar Year	Recycled/Diverted*
2003	15.0%	2007	18.3%
2004	15.0%	2008	19.6%
2005	18.7%	2009	19.1%
2006	18.6%	2010	19.7%

* *The Recycled/Diverted rate is actually higher than indicated since many businesses that recycle in Montana, or market recyclable materials, do not report their tonnages.*

Benefits of Recycling

Recycling generates significant economic benefits for communities. Recycling employs workers from a range of skill levels in a variety of jobs from materials handling, processing, and shipping to high-skilled, high-quality product manufacturing. The drive to more efficiently process recycled materials, and to develop new products and markets, spurs innovation which is a key to long-term economic growth. Investment in recycling companies and equipment filters through the local economy, and contributes to economic growth.

Equally important are the social and environmental benefits of recycling. Recycling promotes a more sustainable use of natural resources. Recycling activities across the state promote community development while conserving public resources. Landfills last longer and fewer new

ones are necessary. Pollution is prevented, energy is saved, and less greenhouse gas is emitted.

The National Recycling Coalition's (NRC) Environmental Benefits Calculator computed that the following benefits were achieved by the materials diverted from Montana landfills in 2010:

- Greenhouse gas was reduced by the equivalent of 227,470 passenger cars being removed from the roads.
- A total of 13.0 million BTU's were saved by recycling.
- 250,584 trees were saved by the recycling of newsprint, mixed paper, and office paper.

In addition the following *natural resource* savings were calculated:

Natural Resources Saved	
2010 Ferrous Steel Recycled	**103,063 Tons**
Iron ore saved per ton steel recycled	2,500 lbs.
Coal saved per ton steel recycled	1,400 lbs.
Limestone saved per ton steel recycled	120 lbs.
Iron ore saved	**128,829 Tons**
Coal saved	**72,144 Tons**
Limestone saved	**6,184 Tons**

As demonstrated by the results of the NRC calculations, there are numerous ways to express resource savings through recycling. Recycling saves energy otherwise used to mine and process raw materials. As Montana recycling statistics increase, the energy efficiencies become more evident. Visit the NRC calculator at:
http://www.crra.com/nrcfiles/calculator/coverletter.html

2010 Recycling and Waste Diversion Summary

The data used for the 2010 Summary was collected from the Annual License Renewal applications completed by solid waste management facilities licensed to operate in Montana. Licensed facilities include landfills, transfer facilities, compost operations, and resource recovery facilities. Non-licensed solid waste facilities include some recycling operations, end processors, and brokers. Recycling information from these non-licensed facilities is obtained through an annual survey. Response to the survey is *voluntary*, and it's important to note that several businesses chose *not* to divulge their 2010 recycling information. In addition, the information from some retail stores — particularly "big box" stores that recycle cardboard and plastic — is not included because this information is not currently available on a state level. Consequently, the recycling numbers reported are clearly more conservative than the amounts actually recycled.

The materials diverted from Montana landfills are sorted into two categories for reporting purposes — "Recycled Commodities" and "Other Recycled or Diverted." The materials contained in each category are listed below.

Recycled Commodities

- Office paper, mixed paper, newspaper, magazines, catalogs, telephone directories
- Corrugated cardboard, chipboard or boxboard
- Plastic
- Glass
- Aluminum Cans
- Ferrous scrap metal, mixed metals, steel cans, white goods

Other Recycled or Diverted

- Organic material: yard and landscape waste, manure, agriculture wastes, sewage sludge, animal highway mortalities (composted by MDT)
- Carpet, textiles
- Fly ash
- Aggregate
- Construction/demolition debris
- Electronic waste, batteries
- Automotive fluids, waste vegetable oil

Montana's Recycling Data

In Montana 1.7 million tons of Municipal Solid Waste (MSW) was generated during 2010. Based on the census population figure of 989,414, on average each day every Montanan contributed 7.5 pounds to the state's landfills, recycled 1.47 pounds, and diverted .38 pounds of solid waste. On a national level, the Environmental Protection Agency's (EPA) reports a lower average of 2.4 lbs. per U.S. resident per day is destined for a landfill. The EPA 2010 report can be viewed at: http://www.epa.gov/wastes/nonhaz/municipal/pubs/msw_2010_factsheet.pdf.

Recycling is a challenge in Montana – the state is rural, has limited recycling infrastructure, and is distant to markets.

Table 1 sorts into three categories the waste that was generated in Montana during 2010 – waste that was landfilled, commodities that were recycled, and material that was recycled or diverted in some manner from landfills (e.g., composting).

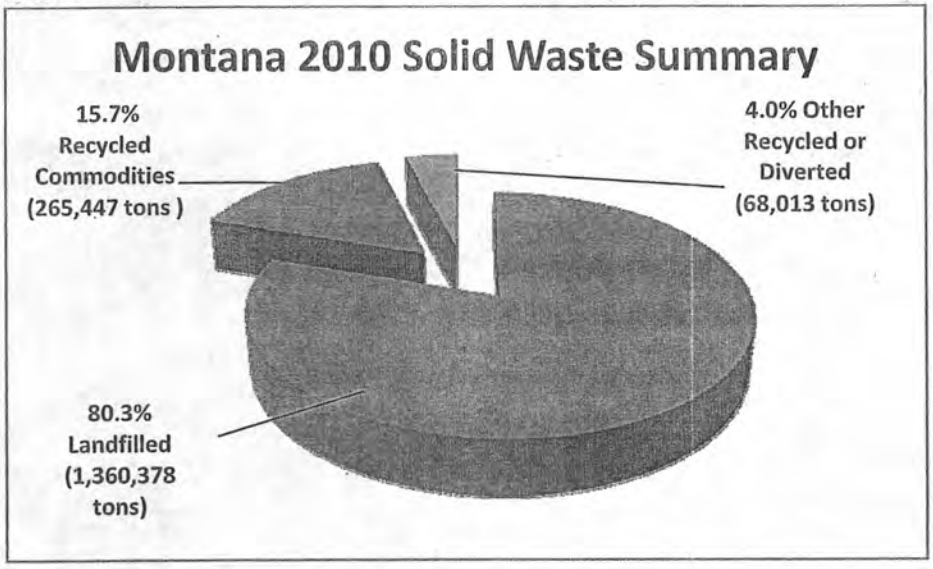
Table I.

2010 Montana Data

	Tons		Tons	
Amount of Solid Waste ***Landfilled***			1,360,378	80.3%
Amount of Solid Waste ***Recycled***	265,447	15.7%		
Other ***Recycled/Diverted*** from Landfill	68,013	4.0%		
Total Amount Recycled and Diverted			333,460	19.7%
Total Solid Waste Generated in Montana			1,693,838	100%

Chart I illustrates the breakdown of the state's solid waste. During 2010, the reported amounts show that 80.3 pecent of the solid waste generated in Montana was sent to landfills, and 19.7 percent was recycled or diverted from the landfill for another use.

Chart I.



2010 Compared to 2009

It's interesting to note the changes (Table II.) that took place in the reported Solid Waste data when comparing 2009 to 2010. The overall amount of Solid Waste generated (landfilled, recycled, and diverted) remained nearly static as almost 1.7 million tons were reported for each year.

Table II.

Montana's Solid Waste	Reported in 2009	Reported in 2010	Difference
Tons of Solid Waste Landfilled	1,370,950 tons	1,360,378 tons	Landfilled amount ***decreased*** by 10,572 tons
Recycled Commodities	176,446 tons	265,447 tons	Recycled Commodities ***increased*** by 89,001 tons
Other Recycled/Diverted	147,490 tons	68,013 tons	Other Recycled/Diverted ***decreased*** by 79,477 tons
Total Reported	**1,694,885 tons**	**1,693,838 tons**	Total Solid Waste ***decreased*** by 1,047 tons

Landfilled Material

Nationwide, the amount of material landfilled has decreased due to the weakened economy. When less material is purchased, less waste is discarded. In Montana the economy, paired with the increase in the amounts recycled, are factors that may contribute to this decrease.

Recycled Commodities

All materials in the "Recycled Commodities" category, with the exception of glass, can be marketed to generate revenue. During 2010 the prices paid for these materials, especially metals, began to rebound from the 2008 price crash. As shown in the *Individual Material*

Comparison, Table III, the collection of these materials increased accordingly. Additionally, in 2010 a small portion of the Federal stimulus money was used to build the recycling infrastructure in Montana, which may have had an impact on the amounts of recyclable materials collected.

Table III.

Individual Material Comparison				
MATERIAL TYPE	Reporting year 2009	Reporting year 2010	*Difference in Tons*	
Recycled Commodities				
Aluminum Cans	1,666	2,501	835	*increase*
Steel Cans	115	130	16	*increase*
Scrap Metal	130,717	211,614	80,897	*increase*
Glass	1,395	439	-956	*decrease*
Plastic Containers and film	498	1,577	1,079	*increase*
Corrugated Cardboard	25,728	30,482	4,754	*increase*
Paper (office, newspaper, magazines)	16,327	18,704	2,377	*increase*
subtotal	176,446	265,447	89,001	*increase*
Other Recycled or Diverted				
Composted organics	68,391	51,865	-16,526	*decrease*
Construction & Demolition		5,143	5,143	*increase*
Other Recyclables	9,209	9,491	282	*increase*
Carpet	83	284	201	*increase*
Electronics	531	706	176	*increase*
Aggregate	39,476		-39,476	*decrease*
Fly Ash	29,800	525	-29,275	*decrease*
subtotal	147,490	68,013	79,477	*decrease*
Total Tons Recycled	**323,936**	**333,460**	9,524	*increase*

Other Recycled or Diverted

The remaining reported materials, "Other Recycled or Diverted" decreased by a large amount. Less material diverted for composting was reported. The larger factor was the decrease in the amounts of aggregate and fly ash reported for 2010. High fuel prices in 2010 may have been a factor that contributed to these heavy materials not being transported to recyclers.

Summary

Recycling in Montana is effectively working and growing. The recycling rate is gradually increasing as additional infrastructure is developed. The current higher pricing paid for commodities encourages new business investment. Montana residents are responding to the increased opportunities to recycle locally. For more information on recycling, and to read case studies about DEQ's recycling/diversion projects, visit the DEQ website at www.recycle.mt.gov.

APPENDIX D: LEGISLATIVE SUMMARY – 2007, 2009 and 2011

2007 Legislative Summary

HB 167 - Revise Process for Adopting Solid Waste Management Plan

Revises the Integrated Waste Management and Solid Waste Management laws; revising the process for adopting the State Solid Waste Management and Resource Recovery Plan; transferring the authority to adopt the plan from the Board of Environmental Review to the Department of Environmental Quality.

Amending sections 75-10-104, 75-10-106, 75-10-111, 75-10-807 and 75-10-920 MCA

HB 555 – Public Education Program for Recycling and Electronic Waste Disposal

Requires the Department of Environmental Quality to provide information in the Household Hazardous Waste public education program about recycling or the safe disposal of electronic waste.

Amending section 75-10-215 MCA

HB 144 – Clarify Waste Management Laws

Revises the waste management laws; authorizing the Department of Environmental Quality to enjoin the transportation of solid waste if there is a violation; revising certain definitions and defining certain terms under the Infectious Waste Management Act; making a violation of the Infectious Waste Management Act a misdemeanor; requiring the Department of Environmental Quality to adopt rules governing the inspection and regulation of the transportation and management of infectious waste.

Amending sections 75-10-231, 75-10-1003, 75-10-1004, and 75-10-1006 MCA

HJ 24 – Urge Ban of Exportation of Elemental Mercury

A joint resolution of the Senate and House of Representatives of the State of Montana urging congress to ban the sale, distribution, transfer, or export of elemental mercury.

Amending section N/A

2009 Legislative Summary

SB 424 – Control Disposal of Mercury Thermostats

Establishes the mercury-added thermostat collection act; banning mercury-added thermostat sales and installation; requiring collection and recycling of mercury-added thermostats; providing rulemaking authority; and providing an immediate effective date.

Amending section N/A

SB 68 – Roadkill Composting

An act creating an exception to the unlawful disposition of dead animals for licensed composting facilities.

Amending section 75-10-213 MCA

HB 21- Repeal Termination Date for Recycling Tax Incentives

Repeals the termination date for credit against air quality permitting fees for certain uses of postconsumer glass in recycled material' repealing the termination date for the tax credit for investment in property used to collect or process reclaimable materials; and repealing the termination date for the tax deduction for the purchase of recycled materials.

Amending Sections 75-2-225 and 75-2-226 Repealing Section 9, Chapter 712, Laws of 1991; Sections 4 and 5 Chapter 542, Laws of 1995; Section 1, Chapter 411, Laws of 1997; Sections 4, 5, 6, and 7, Chapter 398, Laws of 2001; Section 8, Chapter 516, Laws of 2001; Sections 3 and 5, Chapter 129, Laws of 2005; and Sections 1, 2, 3, 4, 5, 6, 7, and 8, Chapter 569, Laws of 2005.

SJ 28 – Resolution Requesting an Interim Study on Recycling and Solid Waste Recovery

A joint resolution of the Senate and House of Representatives of the State of Montana requesting an interim study to evaluate methods for increasing recycling and solid waste recovery with the State of Montana.

Amending section N/A

****Note – a copy of the study report can be found following this summary

2011 Legislative Summary

SB 236 – Revise Solid Waste Laws Related to Local Governments

Revises the Solid Waste Management laws related to powers and duties of local governments; clarifying a local government's authority to control the disposition of solid waste generated with the jurisdiction of the local government.

Amending section 75-10-112 MCA

The Coke Can From Columbus

An analysis of methods for increasing recycling and solid waste diversion in Montana

A Report to the 62nd Montana Legislature
Environmental Quality Council
Prepared by Sonja Nowakowski
September 2010

Legislative Services Division

The Coke Can From Columbus

An analysis of methods for increasing recycling and solid waste diversion in Montana

A Report to the 62nd Legislature
September 2010

Environmental Quality Council
2009-10 Interim

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This report is a summary of the work of the Environmental Quality Council, specific to the EQC's 2009-10 recycling study. Members received volumes of information and public testimony on the subject, and this report is an effort to highlight key information and the processes followed by the EQC in reaching its conclusions. To review additional information, including written minutes, exhibits, and audio minutes, visit the EQC website:
www.leg.mt.gov/eqc

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Introduction

Recycling isn't as simple as tossing a pop can into the aluminum bin outside a shopping center. Take the case of the Coke can in Columbus. For the sake of example, let's say the can is left in a bin at a community drop-off site. Next it makes the 40-mile journey to Billings where it is delivered to Pacific Steel and Recycling. Then the can is cleaned (using magnets), crushed, and compacted into a bale that weighs anywhere from 900 to 1,000 pounds. Between 40 and 50 bales are then loaded onto a semitrailer that heads to an Anheuser-Busch recycling center in Colorado. After the 7-hour journey to Colorado, the bale is shredded into potato chip-thin pieces, melted with virgin aluminum, and cast into ingots. The ingots are coiled and either make the trip to another can manufacturing plant or are rolled and stamped on site. The cans might next be filled at an Anheuser-Busch brewery or again be shipped to another beverage company where they are filled and sealed. (Anheuser-Busch recycles more than 27 billion cans each year — far exceeding the number of cans Anheuser-Busch breweries annually package.[1])

Despite the miles traveled, in most cases, that Coke can from Columbus is back on the shelf in 60 days. And using a recycled aluminum can to make a new can uses 95% less energy than making a can from virgin ore.[2]

Aluminum cans are the most recycled and most recyclable beverage containers in the world, and an estimated 105,784 cans are recycled every minute nationwide.[3] While the Coke can in Columbus illustrates a success story, recycling challenges in Montana abound.

This report is the result of Senate Joint Resolution No. 28, which was passed and approved by the 2009 Legislature. S.J. 28, included in **Appendix A**, requested an interim study to evaluate methods for increasing recycling and solid waste diversion in Montana. The study was assigned to the Environmental Quality Council (EQC). The tasks assigned to the Council and a brief summary of the EQC's responses are included in **Appendix B**. The EQC's findings address recycling barriers and discuss the potential role, if any, the state should play in long-term solutions to those barriers.

The EQC put the S.J. 28 draft report out for public comment between June 2, 2010 and July 2, 2010. Public comment was received from eight individuals and is posted on the

[1] http://www.anheuser-busch.com/Environment/RecyclingCorp.html.

[2] http://www.eia.doe.gov/kids/energyfacts/saving/.

[3] http://www.cancentral.com/funFacts.cfm.

EQC website under the S.J. 28 study materials. The public comment is also available for review by contacting the EQC office.

EQC Findings

Study Task:

Evaluate and propose potential methods for increasing the recycling rates in the state of Montana.

Finding:

✔The solid waste reduction targets established in 75-10-803, MCA, should be updated to encourage more recycling and composting.

Study Task:

Analyze options to address rural recycling challenges.

Findings:

✔Montana's relatively small population, spread across a large geographic area, makes recycling efforts more challenging. Rural communities should work together to create increased opportunities and networks for recycling.

✔Rural communities are encouraged to investigate a variety of collection methods to promote recycling in their communities. Collection programs that target large commercial sources of recyclables (such as cardboard from the local grocery store) can generate larger volumes of materials.

✔When considering the economics of recycling, the public and local governments must recognize that recycling is part of the entire municipal solid waste management strategy and can reduce disposal costs by reducing the need for future landfill expansions.

Study Task:

Propose programs to address electronic and household hazardous waste.

Finding:

✔Using existing resources and statutory direction, the DEQ is appropriately acting as a clearinghouse for information on electronic waste recycling opportunities and household hazardous waste disposal.

Study Task:

Evaluate funding alternatives.

Finding:

✔Montana recognizes that each city, county, and town is unique and that there is no one right way to recycle. Montana communities are encouraged to explore

opportunities for enhanced recycling and select those options that are the best fit for each community's need.

Study Task:

Analyze methods to promote market development of recycled materials.

Finding:

✔Montana recognizes that high transportation costs and long distances to recycling markets make recycling of many commodities difficult. To overcome this obstacle, local markets for recyclable materials need to be established in Montana.

Montana's Recycling Framework

There is a hierarchy to waste management, of which recycling is just one part, according to Montana's Integrated Waste Management Plan. The first consideration in waste management is source reduction, or simply taking steps to reduce waste in the first place. The next step is reuse, giving some item, like an unwanted piece of furniture, a second life. The focus of this report is third in line — it's recycling. Recycling is a process. It's taking a product that has been used and introducing it into the manufacturing process to produce something new. Composting is next in the pecking order, and finally landfill and incineration round out the waste management hierarchy. The hierarchy, as outlined in the waste management plan, is not based on economics, but rather is based on the long-term benefits of reducing energy and pollution.

Senate Joint Resolution No. 28 requested a study that focused on increasing recycling and solid waste recovery.

Before diving into a discussion of recycling, it is important to consider Montana's solid waste regulations and where recycling fits into the picture. The federal Resource Conservation and Recovery Act (RCRA) of 1976 required the Environmental Protection Agency (EPA) to adopt rules that define and prohibit open dumping and establish criteria for states to use in the regulation of solid waste disposal. Subtitle D of RCRA provides for the regulation of municipal solid waste and encourages resource recovery or recycling.[4] State laws guiding the regulation of solid waste include the Montana Solid Waste Management Act[5] and, discussed in more detail below, the Integrated Waste Management Act.[6] The Department of Environmental Quality (DEQ) has adopted administrative rules to implement the federal regulations contained in RCRA granting the state the primary responsibility over disposal of solid wastes.

Local governments play a key role and are responsible for financing, planning, constructing, and operating solid waste management systems that comply with state and federal regulations. Private contractors, cities and towns, and counties all provide this function. Counties have the ability to create solid waste management districts that can include cities, towns, and one or more counties. Montana law also notes the critical role of the private sector, stating, "Private industry is to be utilized to the maximum

[4] 40 CFR part 258.

[5] Title 75, chapter 10, part 2, MCA.

[6] Title 75, chapter 10, part 8, MCA.

extent possible in planning, designing, managing, constructing, operating, manufacturing, and marketing functions related to solid waste management systems."[7]

In 1991, the Montana Integrated Waste Management Act was established by the Montana Legislature and set a goal to reduce the amount of waste landfilled in Montana by 25% by 1996, a goal that was not reached. It also established a hierarchy for waste management discussed earlier — reduction, reuse, recycling, composting, and landfilling or incineration. The 1995 Legislature also moved solid waste responsibilities from the Montana Department of Health and Environmental Sciences and placed them with the permitting and compliance division of the DEQ.

The 2005 Legislature approved House Bill No. 144, which eliminated the 25% requirement and instead added the incremental steps now outlined in the law. It is noteworthy that the 25% goal was a waste reduction goal, not a recycling goal. Source reduction and reuse are difficult to measure. H.B.144 established a goal that was considered to be current and measurable and that includes recycling and composting targets.

Recycling in Montana falls under the "Montana Integrated Waste Management Act". The DEQ develops and implements the Montana Integrated Waste Management Plan (IWMP). The state's Integrated Waste Management Plan Task Force reviews the plan and makes recommendations to update the plan every 5 years, with the next update required by the end of 2011. The act requires the involvement of local officials, citizens, solid waste and recycling industries, environmental organizations, and others involved in the management of solid waste.

The IWMP includes a discussion of policies, potential legislation, education, technical assistance, and other suggestions in the areas of source reduction, reuse, recycling, and market development. Targets for the rate of recycling and composting, which aim to reduce the amount of solid waste that is generated by households, businesses, and governments and that is either disposed of in landfills or burned in an incinerator, currently include:

(1) 17% of the state's solid waste by 2008;
(2) 19% of the state's solid waste by 2011; and
(3) 22% of the state's solid waste by 2015.[8]

The 2006 IWMP identifies both barriers to and recommendations for recycling in Montana. Those recommendations served as a useful starting point for the EQC's discussion of recycling in Montana. The barriers and recommendations outlined in the IWMP are below.

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[7] 75-10-102(1)(c), MCA.

[8] 75-10-803, MCA.

2006 IWMP Identified Barriers:

- Montana's relatively small population, which is spread out across a large geographic area, makes recycling efforts more challenging.
- The lack of nearby industries that use recyclables as raw materials in their operations poses another obstacle.
- It is difficult to measure recycling without mandatory reporting.
- Landfills are convenient and relatively inexpensive in Montana, making it difficult for recycling to be an economic choice based on the cost of disposal.
- There is a lack of funding for recycling programs.
- There is a lack of commitment by the public to fully support recycling in all its forms.

- **2006 IWMP Identified Recommendations:**
- Develop local markets for recyclable goods by collaborating and forming partnerships between private and public entities. This could require changing state regulations to allow an alternative source of material.
- Provide additional economic incentives for recycling. The 2009 Legislature approved EQC-proposed legislation that made the current tax credits and deductions permanent.
- Support national legislation that requires manufacturers to take back their products at the end of their useful life.
- Expand recycling opportunities through additional funding mechanisms with support from the solid waste industry, such as increasing solid waste fees to help pay for recycling programs. "Increasing solid waste fees would only be done with support of those involved, particularly the fee payers."[9]

As the IWMP update begins in 2011, the task force is encouraged to explore opportunities for advancing local government and private investor efforts to complete feasibility studies related to the use of municipal solid waste for power generation. Those opportunities could include matching grant programs. EQC member Mary Fitzpatrick included an overview of a proposal that is included in **Appendix C** and may be useful to the task force.

History of Recycling in Montana

In 1916, Carl Weissman started buying and selling buffalo bones, furs, steel scrap, and junk car parts — officially becoming the first organized, professional recycler in Montana. By 1919, Pacific Hide and Fur opened operations in the state and by the early 1950s expanded into steel sales.

[9] "Integrated Waste Management Plan (IWMP) 2006", Montana DEQ, Air, Energy and Pollution Prevention Bureau, September 2005, page 59.

Household recycling started in 1971 when Montana Recycling Inc. started collecting aluminum cans and bottles. As markets changed, paper products and nonferrous scrap were also collected. During the 1980s and 1990s recycling increased across the state, and private buy-back centers started to pop up. Composting also increased in popularity.

In Montana, recycled materials are collected and typically shipped to out-of-state markets. The distance to these markets and Montana's small population have always hindered recycling efforts. The markets for recyclables also are easily and quickly influenced by international markets. By the early 1990s, the cost of shipping and market prices curtailed the recycling of many products, specifically plastic and glass.[10] Two cement companies, however, started to use glass as a source of silica for the manufacturing process, and DEQ regulations were altered to accommodate the change.

Local solid waste managers also increasingly started to collaborate in the 1990s to encourage recycling. In late 1997, for example, Headwaters Cooperative Recycling Inc. was established. Only three landfills remained in a 10-county region, largely in southwestern Montana, that the cooperative served. Headwaters has become a nonprofit cooperative that enables recycling by linking rural and urban communities. It is now the largest recycling cooperative in the United States, serving 190,000 Montana and Wyoming residents as well as millions of visitors to Yellowstone National Park.[11]

By 2008, Montana's recycling rate was over 19.6%, ahead of the goal currently established in state law. The DEQ continues to direct resources toward recycling, working closely with private businesses and other entities. Electronics recycling events, pesticide plastic recycling collections, and mercury thermostat and thermometer collections have been pursued in the last 2 years. The increase from 18.3% in 2007 to 19.6% in 2008 is largely attributed to an increase in scrap metal and other metal prices and the amount recycled. With the downturn in the economy and metal prices, such an increase is not expected in the next few years.

By 2008, Montana's recycling rate was over 19.6%, ahead of the goal currently established in state law.

Measuring the amount of waste that is recovered through recycling, however, is a challenge. The DEQ follows EPA guidelines, which measure only municipal solid waste recycling. This means Montana's rates may appear lower than rates in other states that measure and include other recycling activities. As noted above, Montana's Integrated Waste Management Act sets goals for recycling rates that the DEQ is expected to

[10] "Integrated Waste Management Plan (IWMP) 2006", Montana DEQ, Air, Energy and Pollution Prevention Bureau, September 2005, page 22.

[11] http://www.headwatersrecycle.com/.

achieve. The Act does not require recyclers, brokers, processors, or other recycling businesses to report data to the DEQ. This means that Montana's recycling rate is based on data that is voluntarily provided. "DEQ recognizes that the voluntary reporting in Montana is not as complete or as accurate as some states that have mandatory reporting," according to the DEQ. This is also noted in the IWMP recommendations.

Solid Waste Characterization

General Waste

While recycling efforts have increased over the last few years, solid waste generation in Montana also continues to increase. The DEQ estimates that about 1.6 million tons of waste was generated in 2008. Based on Montana's population, the annual generation rate is about 9.3 pounds/person per day and the rate of recycling is 1.82 pounds/person per day. Montana's generation rate is significantly higher than the national average, which was about 4.5 pounds/person per day in 2008. Montana's recycling rate was also higher than the national average of 1.5 pounds/person per day. However, these rates are worthy of further review.

Pegging a number on how much truly goes into Montana's landfills is tricky. Some landfills simply estimate waste tonnage as a function of population. It's also noteworthy what actually is classified as solid waste in arriving at the numbers noted above. The definition of municipal solid waste includes packaging, newspapers, paper, magazines, plastics, glass, yard waste, wood pallets, food scraps, cans, appliances, tires, electronics, furniture, and batteries. It does not include construction and demolition waste or agricultural wastes. In Montana, however, these materials are often disposed of in municipal solid waste landfills. They are then included in the total landfilled tonnage, which inflates the tonnage reported above. All agricultural waste from leased Bureau of Land Management land, for example, is landfilled with municipal solid waste. Debris from hailstorms, snowstorms, and even forest fires can often be added to the totals in Montana's landfills.

Montana imports and exports some waste. In 1993, a prohibition on the importation of out-of-state waste ended. In 2008, Montana imported about 39,767 tons of out-of-state wastes from communities in Idaho, Wyoming, North Dakota, Washington, Canada, and Yellowstone National Park. Facilities that accept out-of-state waste are charged 27 cents per ton in addition to the 40 cents per ton access on in-state wastes. The state is estimated to export a similar amount (the total is not tracked by the DEQ) to other states.

Construction and demolition waste generated varies from community to community, based on differences in construction style and growth. "In Montana, most construction and demolition waste is discarded at Class II landfills," according to the DEQ. "Operators may separate construction and demolition waste from the rest of the waste

stream, but they are not required to do so." A growing number of landfills in Montana are starting to build construction and demolition waste cells at landfills in an effort to better track tonnage in the future. On a national scale, construction and demolition waste usually represents about 30% of total waste — the largest single source in the waste stream. An average, new construction project yields about 3.9 pounds of waste per square foot of building area. **Figure 1** provides a breakdown of that waste. Using the national number as a baseline, one could estimate about 380,111 tons of construction and demolition waste is generated in Montana.

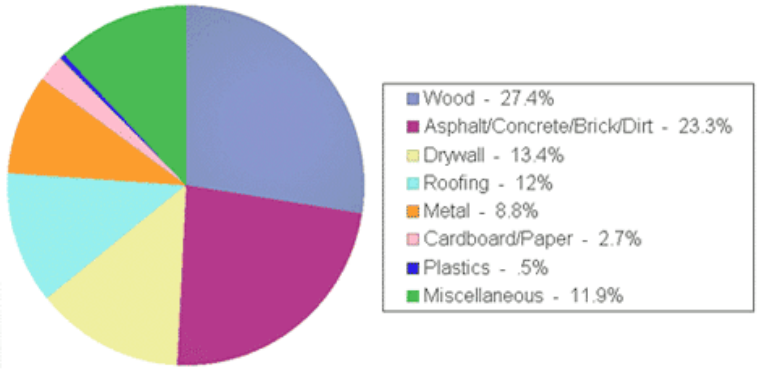

Figure1: Average Composition of C&D

Special Wastes

Montana law currently addresses both electronic and hazardous waste recycling. The IWMP recognizes these wastes under the umbrella of "special wastes". These wastes are identified separately from others in the plan because of their toxicity and the increased possibility of contamination from small amounts. Focusing on the requirements of S.J. 28, this information focuses on household hazardous wastes, electronic waste, batteries, and waste tires. It does not include a review of hazardous waste management facilities, which operate in accordance with Title 75, chapter 10, part 4, MCA, or asbestos-containing materials.

The 2006 IWMP, the most recent plan, identifies recommendations for increasing the recycling of both household hazardous wastes and electronic waste. The recommendations include:

- Establish additional opportunities for collecting household hazardous waste by increasing the number of drop-off sites that are open and increasing the frequency of collections
- Coordinate collection events in multiple communities.
- Provide a source of funding for collection of hazardous wastes generated by households and conditionally exempt small quantity generators.
- Ban whole tires from landfills.
- Collect a fee on new tires that can be used to support tire recycling.
- Form partnerships and look for opportunities to recycle tires locally.
- Label batteries or place signs at locations where batteries are sold to direct consumers to recycling locations.
- Educate consumers on the importance of recycling electronics waste.

- Encourage the reuse of electronic equipment.
- Partner with retailers for buy-back or recycling programs.
- Work with other states on national policies.
- Establish procurement guidelines to choose the best environmental options for electronics purchases in both the public and private sectors.[12]

Hazardous Waste

Federal law allows for the disposal of household hazardous waste in the trash, but many states and local governments establish collection programs for those wastes to reduce the amount going into area landfills. Household hazardous waste is defined as "products commonly used in the home that due to corrosivity, ignitability, reactivity, toxicity, or other chemical or physical properties are dangerous to human health or the environment."[13] Wastes include cleaning, home maintenance, automobile, personal care, and yard maintenance products. The DEQ is required to be a clearinghouse for information on household hazardous waste disposal. The DEQ must administer a statewide household hazardous waste public education program.[14] The program must provide alternatives to the disposal of hazardous waste at landfills, options for recycling, methods for reuse or recycling, and alternatives to the use of products that lead to the generation of household hazardous waste. In the IWMP, the state identifies economic issues related to the recycling of household hazardous waste, noting, "Although the selection of non-hazardous waste may prove to be an expensive alternative to commonly available chemicals, the ease of disposal may offset the higher initial cost."

Household Hazardous Waste Figures (Provided by EPA)

➜Americans generate 1.6 million tons of household hazardous waste per year.
➜The average home can accumulate as much as 100 pounds of household hazardous waste in the basement and garage and in storage closets.

The DEQ provides information through a website about hazardous waste recycling. Information about the recycling of batteries, oil, compact fluorescent lights (CFLs), mercury, and pharmaceuticals is included. With the use of CFLs on the rise, there has been increased attention on recycling. More than 670 million mercury-containing bulbs (largely CFLs) are discarded each year, according to the EPA.[15] Many go into local landfills, raising concerns about the release of elemental mercury. In 2008, Home Depot

[12] "Integrated Waste Management Plan 2006", Department of Environmental Quality, September 2005, pages 11-12.

[13] 75-10-203, MCA.

[14] 75-10-215, MCA.

[15] http://www.epa.gov/waste/hazard/wastetypes/universal/lamps/faqs.htm.

launched a free CFL recycling program at its stores. States also are increasingly looking at CFLs. In 2009, Maine became the first state to require CFL manufacturers to provide for the free collection of household CFLs by 2011.[16]

Montana also generates more than 880,000 waste tires annually, according to the EPA.[17] During the 1997-98 interim, the EQC conducted a study that examined waste tire management in Montana. The report found, "At this time, Montana does not have a problem with waste tire management which is significant enough to warrant statewide policy changes in the current situation."[18] Because fewer than 1 million waste tires are generated annually and because of the low population density, it is difficult to provide waste tire recycling programs. Other states have a greater ability to promote the use of waste tires in civil engineering projects. Waste tires are also spread over a large geographic area in Montana, which isn't attractive to tire processors and recyclers. Montana landfills also generally have sufficient capacity to accommodate scrap tires, according to the report.

Montana communities have established household hazardous waste programs. The Gallatin Local Water District, for example, has produced a pamphlet that discusses options for disposing of household hazardous waste throughout the Gallatin Valley.[19] The Flathead County Solid Waste District holds a household hazardous waste collection day on the third Saturday of every month. In 2008, using money provided by the DEQ and EPA, the Ravalli County Environmental Health Department held two collection events for hazardous materials. At the first event, 24 tons of household hazardous waste, including paint, pesticides, and solvents, were collected. At a second event, 24 tons of electronic waste were collected.

The Montana Department of Agriculture provides a waste pesticide and pesticide container collection, disposal, and recycling program in accordance with 80-8-111, MCA. From 1994 to 2008, more than 320,680 pounds of waste pesticides have been disposed of through the program, according to the state. The program is funded in part by license fees that private, commercial, and government pesticide applicators and pesticide dealers pay to be licensed in Montana. The disposal fee is free for the first 200 pounds and 50 cents per pound for amounts in excess of 200 pounds. Participants preregister unusable pesticide with the department prior to collection.[20]

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[16] http://www.mainelegislature.org/legis/bills/bills_124th/chapters/PUBLIC272.asp.

[17] http://deq.mt.gov/Recycle/Tires/index.asp.

[18] "Status of and Alternatives for the Management of Waste Tires in Montana: Report to the 56th Legislature," EQC, 1998.

[19] http://www.gallatin.mt.gov/Public_Documents/GallatinCoMT_WQDFactSheets/S008FA.5A0-022E014F.0/HHW%20Disposal%20Options.pdf.

[20] http://agr.mt.gov/pestfert/disposal.asp.

Electronic Waste

The 2007 Legislature amended the household hazardous waste statute discussed above, requiring the DEQ to also provide information about the recycling and safe disposal of electronic waste, including video, audio, and telecommunications equipment, computers, and household appliances. There is not currently a federal mandate to recycle electronic waste (e-waste); however, there have been numerous attempts to develop federal regulations. The EPA currently is involved in an education program that stresses the reuse and recycling of electronics. A federal website outlines options for the safe recycling of various products. The state of Montana has taken a similar approach, with the DEQ providing a website that informs consumers about the manufacturers and retailers who are taking back and recycling electronics. The DEQ addressed the EQC in January 2010 and outlined e-waste recycling efforts in Montana. A detailed presentation is included in **Appendix D**. Electronics that are not recycled or reused are likely going into Montana landfills. Concerns are being raised across the country because of the volume of e-waste and because those electronics contain lead, mercury, and some other toxic materials.

Figure 2: Toxic Televisions
Source: Take Back My TV

In 1998, a National Safety Council study estimated about 20 million computers became obsolete in 1 year, and in 2007 that number has more than doubled according to EPA's most recent estimates. The EPA also estimates that only 18% of the 2.25 million tons of televisions, cell phones, and computer products that have reached the end of their useful life are recycled, leaving about 1.84 million tons to be disposed of in local landfills. "Every day Americans throw out more than 350,000 cell phones and 130,000 computers, making electronic waste the fastest-growing part of the U.S. garbage stream."[21] The information provided in **Table 1** provides additional data on e-waste.

The digital television transition also is expected to increase e-waste in U.S. landfills. The EPA has estimated there are 99.1 million unused television sets in the United States, and earlier this year, millions of those televisions became obsolete with the government-mandated switch from analog to digital. Older television sets can contain lead and cadmium. Cathode ray tubes contain, on average, 2 to 5 pounds of lead.[22] The Electronics TakeBack Coalition launched a "Take Back My TV" campaign in anticipation of the June 12, 2009, transition. The group supports national programs that take back and recycle televisions. To date, Sony, Samsung, LG, Panasonic, Sharp, and Toshiba have launched national recycling programs.

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[21] http://www.time.com/time/magazine/article/0,9171,1870485,00.html.

[22] http://www.epa.gov/waste/conserve/materials/ecycling/faq.htm.

Table 1: Recycling vs. Disposal

Recycling vs. Disposal				
	Generated (millions of units)	**Disposed (millions of units)**	**Recycled (millions of units)**	**Recycling Rate (by weight)**
Televisions	26.9	20.6	6.3	18%
*Computer products**	205.5	157.3	48.2	18%
Cell phones	140.3	126.3	14.0	10%
*Computer products include CPUs, monitors, notebooks, keyboards, mice, and hard copy peripherals.				

Source: EPA

Electronics recyclers, however, are reporting an influx of older televisions, especially in states with recycling regulations and mandates. Barbara Kyle, national coordinator for the Electronics TakeBack Coalition, was recently quoted in the *New York Times* stating that Washington State has collected more than 3 million pounds of old televisions a month.[23]

In the absence of federal legislation, several states and municipalities have passed legislation and ordinances guiding the collection of electronic waste. Manufacturers and retailers are also increasingly developing programs to manage their products from "cradle to grave". The laws vary significantly from state to state. Twelve states, plus New York City, have passed legislation mandating statewide e-waste recycling. There are themes in all programs including:

- Definition of products covered by the law
- Program funding
  - Consumer pays model
  - Producer pays model
- Collection and recycling criteria
  - Landfill ban
  - Restrict e-waste exports
  - Recycling standards
- Product restrictions
  - Labeling requirements
  - Registration requirements
  - Restrictions on certain materials
  - Retailer requirements and restrictions

[23] http://www.nytimes.com/gwire/2009/06/15/15greenwire-some-see-e-waste-crisis-trailing-switch-to-dig-81110.html.

In 2009, Indiana became the most recent state to implement an e-waste program. The law requires manufacturers to register with the state and take responsibility for the collection and recycling of their products. Manufacturers must recycle 60% of their sales of those products and report progress to the state. Beginning in 2012, penalties for noncompliance kick in.

Consumers in several states have responded to e-waste programs. Oregon has an E-Cycles program that provides the free recycling of computers and televisions.[24] Manufacturers must label their computers, monitors, and TVs with their brands and register those brands with DEQ. Manufacturers also pay a registration fee, which covers DEQ's administrative costs to implement Oregon E-Cycles.[25]

Retailers are required to provide customers who purchase certain electronics with printed information about the recycling program. Retailers must also ensure that the brands they sell are listed on DEQ's manufacturer compliance list and that the products are affixed with a permanent and visible brand label. After January 1, 2010, the disposal of computers, monitors, and TVs will be prohibited in Oregon. The public quickly responded to the mandate, approved by Oregon's Legislature in 2007. "Less than five months in, Oregon's free electronics recycling program is collecting too much too fast for the largest manufacturer group involved, prompting it to ask the Oregon recyclers it works with to dial back their efforts."[26]

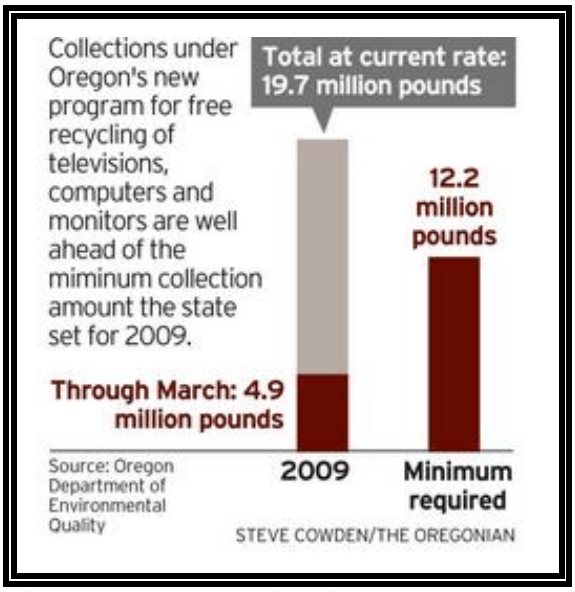

Figure 3: E-waste Floods In
Source: Steve Cowden, The Oregonian

Oregon's law is largely modeled after Washington State's 2006 electronic recycling program.[27] "Since January (2009) Washington State residents and small businesses have been allowed to drop off their televisions, computers, and computer monitors free of charge to one of 200 collection points around the state. They have responded by dumping more than 15 million pounds

[24] http://www.deq.state.or.us/lq/ecycle/index.htm.

[25] Oregon Revised Statutes, 459A.300-365, http://www.leg.state.or.us/ors/459a.html.

[26] "Oregon's electronics recycling too successful for some manufacturers," *Oregonian*, Scott Learn, May 12, 2009.

[27] Revised Codes of Washington, 70.95N, http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95N.

of electronic waste, according to state collection data. If disposal continues at this rate, it will amount to more than five pounds for every man, woman and child per year." [28]

Mandatory e-waste recycling programs, such as those banning disposal in landfills, also raise a number of questions. In 2009 the Consumer Electronics Association and the Information Technology Industry Council filed a legal challenge against a New York City law that requires electronics manufacturers to pay for door-to-door pickup of discarded electronic waste. The technology groups argue the law will increase air and noise pollution by putting more trucks on the streets and cost manufacturers more than $200 million a year. The litigation is expected to set some precedents in terms of the requirements state and local governments can impose on manufacturers and retailers.

In addition, questions have been raised about where recycled electronics ultimately end up. In 2008, the news program *60 Minutes* conducted an investigation that showed many "recycled" electronic items end up in salvage yards in developing nations, where the toxic materials are unleashed into the environment. The investigation tracked e-waste collected at an event in Denver. "It turns out the container that started in Denver was just one of thousands of containers on an underground, often illegal smuggling route, taking America's electronic trash to the Far East."[29]

The 111th Congress is currently contemplating House Resolution 3106, the "Hazardous Waste Electronic Manifest Act". The legislation directs the EPA to establish a hazardous waste electronic "manifest" system. The system would establish a traceable record showing who is in control of the hazardous waste and its ultimate disposition. A similar bill before the 110th Congress was estimated to come at an annual cost of $193 million to $400 million. The legislation, however, also imposes a fee on the users of the system to cover the costs.

Senate Bill 1397 is also before Congress. "The Electronic Device Recycling Research and Development Act", would provide about $85 million over the next 3 years to increase electronics recycling practices. Initiatives that could be funded include: providing grants for research and development into e-waste processes and practices, funding research into environmentally friendly materials for use in electronics, establishing an educational curriculum for engineering students, and publishing a report from the National Academy of Sciences laying out the good and the bad in the current state of electronics recycling. A box showing federal recycling initiatives is shown in **Figure 4**.

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[28] http://www.nytimes.com/2009/06/30/science/earth/30ewaste.html?pagewanted=1&_r=2&ref=global-home.

[29] http://www.cbsnews.com/stories/2008/11/06/60minutes/main4579229.shtml?tag=contentMain;contentBody.

Another consideration when reviewing e-waste is reuse. An estimated 304 million electronics, including computers, TVs, VCRs, and cell phones, were removed from U.S. households in 2005; however, two-thirds of those items were still in working order, according to the Consumer Electronics Association.[30]

Montana's electronics efforts start at the DEQ, where a website is maintained that helps Montanans find out where electronics recycling is available and what types of programs are being developed. Links are provided to manufacturers and retailers. In Montana, there are a number of opportunities. Some charge a processing fee to have an item returned for recycling. Some accept all electronics, while others accept only certain brands.

The DEQ, for example, provides a link to Samsung's e-waste site. At that site, a person can print off a voucher for a product, type in a ZIP code, and find a recycling center. In Helena, the local U-haul collects the products and vouchers and takes them back to the company. Similar information for cell phones is listed. Radio Shack, Target, and Home Depot all accept rechargeable batteries and cell phones for recycling. Verizon refurbishes recycled phones and donates the funds for phones and airtime for victims of domestic violence.[31]

Federal Electronic Waste Recycling Efforts Before Congress

H.R.1580 Electronic Device Recycling Research and Development Act
Authorizes the Administrator of the EPA to award grants for electronic device recycling research, development, and demonstration projects and for other purposes. $18 to $22 million for fiscal years 2010-2012
Latest Major Action: 4/23/2009 Referred to Senate committee

S.1397 Electronic Device Recycling Research and Development Act
Same as H.R. 1580
Latest Major Action: 12/10/2009 Senate committee.

H.R.2595 To restrict certain exports of electronic waste
Amends the Solid Waste Disposal Act to direct the Administrator of the EPA to establish a hazardous waste electronic manifest system.
Latest Major Action: 5/21/2009 Referred to House committee.

H.R.3106 Hazardous Waste Electronic Manifest Establishment Act
Similar to H.R. 2595, with a more detailed manifest system.
Latest Major Action: 6/26/2009 Referred to House committee.

Figure 4: Federal E-waste Efforts

The DEQ also links to a free data eraser to assist people in preparing their electronics for donation. A number of local repair shops and resale stores accept obsolete and used computers. Some recycle the metals, and others refurbish the items to be resold or donated. A contact list is provided by DEQ so that businesses and corporations that are disposing of computers can work with schools and other organizations to donate the materials. State law requires state agencies to work through the Office of Public

[30] http://www.epa.gov/waste/conserve/materials/ecycling/docs/fact7-08.pdf.

[31] http://wirelesssupport.verizon.com/faqs/Company+Information/faq_hopeline.html?t=4.

Instruction to surplus state agency computers to needy schools.[32] The donations are made on a first-come, first-served basis. Since the program started in 1999, more than 24,000 pieces of computer equipment have been distributed to about 400 schools across the state.

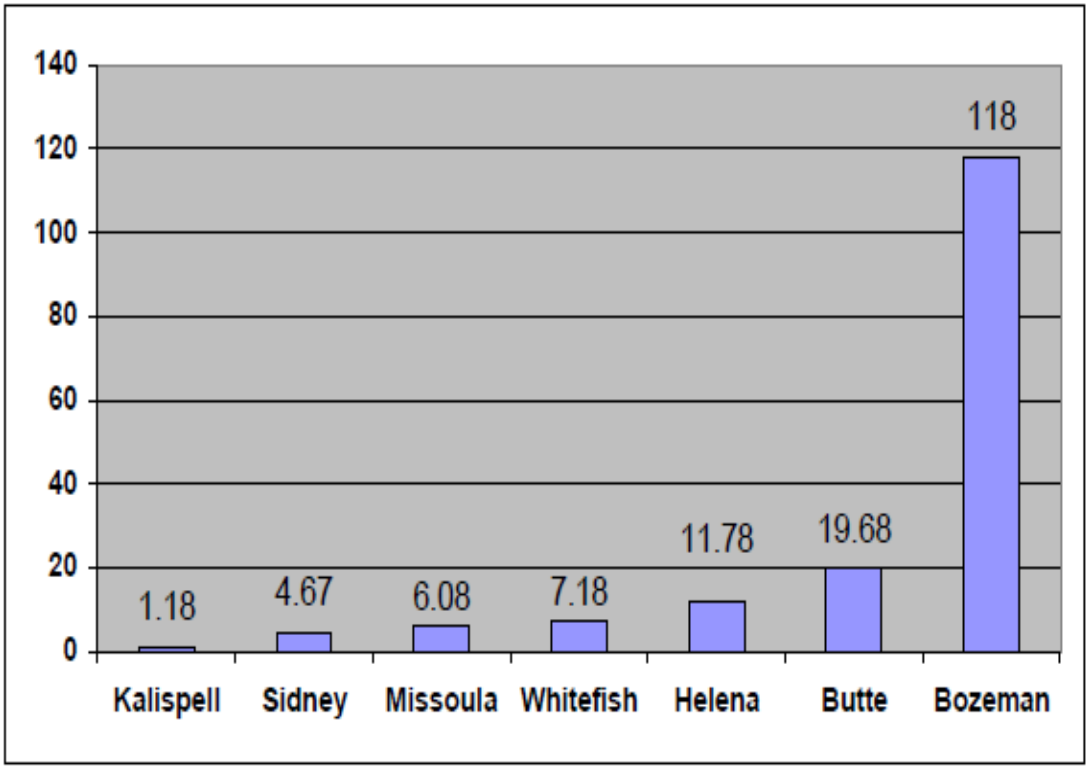
The DEQ also works with businesses and communities to provide electronics recycling collection events. E-waste events are licensed by the DEQ's solid waste program. The only exceptions are when collections take place at previously licensed facilities, like transfer stations. The free event license is good for up to 1 year, and some communities have held more than one event during the license period. The number of e-waste collection event licenses issued by the DEQ has not been consistent. In 2006, seven licenses were issued. In 2008, only two licenses were issued, and in 2009 that number increased to eight licenses. Despite an evolving website and the events, the DEQ, on its website, notes, "These diverse recycling options do not add up to a particularly strong recycling market for computers in Montana, but do offer creative alternatives to land filling."[33]

Bozeman was the first Montana community to host an e-waste event. It was part of the Gallatin Household Hazardous Waste Collection Event in 2003. Additional events have been held in 2004, 2006, and 2007. Using a $10,000 grant from Dell, Inc., a "No Computer Should Go To Waste" event was held in Bozeman and West Yellowstone in 2004. The goal was to collect 15 tons of computer equipment, and instead 44.4 tons were collected. A second event in 2006 had to be shut down an hour early because of the level of participation and the volume of equipment collected — about 118 tons. In 2006, a number of other Montana communities started holding e-waste events. **Figure 5** shows the statewide collection, noting that only Bozeman's event was a free event.

[32] 18-6-101, MCA.

[33] http://deq.mt.gov/Recycle/cpuList.asp.

Figure 5: E-waste Collection



** Statewide, 168 tons collected in 2006. Of that, 118 tons collected at the Gallatin E-waste Event in Bozeman. This was the only collection event that was free to the public.*

Another free event was held in 2007 in Gallatin County. Two major sponsors, Gilhousen Family Foundation and Zoot Enterprises, in addition to a number of other sponsors, helped with the event. The Gallatin Local Water Quality District has organized the events, and volunteers operate the event. A surplus computer and electronics sale was conducted by the Gallatin County Auditor's Office, and equipment that wasn't sold was shipped to Inland Retech in Spokane for recycling. The 2007 event brought in another 68.26 tons of e-waste.[34]

During 2006 and 2007 e-waste events, the DEQ surveyed participants and learned that many were motivated by a desire to prevent pollution and a firm belief that electronic products still have value. In addition, participants noted they would be willing to pay (or pay more) for recycling if it meant the items were responsibly recycled and not illegally disposed of in foreign countries.

[34] 2007 Electronic Waste Recycling Collection Event: Gallatin E-waste Round-up for Gallatin County" Final Report, Gallatin Local Water Quality District, October 2007.

Montana's Recycling Incentives

The EQC spent time during the 2007-08 interim examining the issue of recycling during its Climate Change study, focusing on tax incentives to encourage recycling and on Montana's solid waste management fees. The EQC discussed the following four specific concepts and House Bill No. 21, requested by the EQC and approved by the 2009 Legislature, eliminating the pending termination dates on Montana's recycling tax incentives.

- **Recycled Materials Tax Deduction.** (15-32-610, MCA) Taxpayers who purchase recycled material as a business-related expense can deduct 10% of the expense of the purchase from federal adjusted gross income in arriving at Montana adjusted gross income. The deduction is to encourage the use of goods made from recycled materials. The definition of recycled material is determined by the Department of Revenue.

- **Credit Against Air Permitting Fees for Certain Uses of Postconsumer Glass.** (75-2-224 and 225, MCA) The amount of the credit is $8 for each ton of postconsumer glass used as a substitute for nonrecycled material. The maximum is $2,000 or the total amount of fees, whichever is less. Anyone with a beneficial interest in a business can apply for a credit against the air quality fees imposed in 75-2-220, MCA, for using postconsumer glass in recycled material. The postconsumer glass used in recycled material may not be an industrial waste generated by the person claiming the credit unless:
  - the person generating the waste historically has disposed of the waste onsite or in a licensed landfill; and
  - standard industrial practice has not generally included the reuse of the waste in the manufacturing process.

- **Tax Credit for Investments in Property or Equipment Used to Collect or Process Reclaimable Materials**. (15-32-602 through 604, MCA) An individual, corporation, partnership, or small business corporation may receive a tax credit for investments in depreciable property used primarily to collect or process reclaimable material or to manufacture a product from reclaimed material according to the following schedule:
  - 25% of the cost of the property on the first $250,000 invested;
  - 15% of the cost of the property on the next $250,000 invested; and
  - 5% of the cost of the property on the next $500,000 invested.

  The credit may not be claimed for investments in depreciable property in excess of $1 million, an investment in property used to produce energy from reclaimed material, or an industrial waste generated by the person claiming the tax credit unless:

- the person generating the waste historically has disposed of the waste onsite or in a licensed landfill; and
- standard industrial practice has not generally included the reuse of the waste in the manufacturing process.

- **Deduction for Purchase of Montana-Produced Organic Fertilizer** (15-32-303, MCA) Taxpayers may deduct expenditures for organic fertilizer, such as compost, that is produced in Montana and used in Montana. The deduction is allowed if the expenditure was not otherwise deducted in computing taxable income. The deduction is in addition to all other deductions from adjusted gross individual income allowed in computing taxable income under Title 15, chapter 30, MCA, or from gross corporate income allowed in computing net income under Title 15, chapter 31, part 1, MCA.

A Snapshot: Western States Recycling

Wyoming

Recycling Rate: Wyoming pegs its recycling rate at about 5.1% for commodities, including aluminum and newspaper. That number is bumped up to about 12% if other types of reuse like composting and waste tires are included.[35]

Legislative Action: The 2006 Wyoming Legislature provided $1.3 million to help local government entities prepare Integrated Solid Waste plans. The final plans were due to Wyoming's Department of Environmental Quality by July 2009. Each plan addresses a 20-year period. While the state doesn't have a specific recycling goal, several of the Integrated Solid Waste plans proposed by local governments set a 30% diversion goal, marked by 2% annual growth. The plans also examine the potential costs of lining future landfill sites or hauling trash to other locations. The recycling goals will be increasingly incentivized as local governments review those potential costs.

Incentives: Wyoming, like Montana, struggles with recycling largely because of the distance to markets. There are currently no tax incentives for the recycling industry.

Colorado

Recycling Rate: In 2007 the state of Colorado reported a 16.6% recycling rate for municipal recycling. The total diversion rate, which includes diversion of construction and demolition waste, bumps that rate up to 28.5%. The state also has taken several steps in the last 2 years to bolster its recycling efforts.

Legislative Action: The Colorado "Climate Action Plan" calls for a 75% reduction in state waste by 2020, and in an effort to reach that goal, the 2007 Colorado Legislature approved the Recycling Resources Economic Opportunity Act.[36] The Act implemented new landfill surcharges, which went into effect in July 2007, in order to fund a recycling grant program. The additional surcharges fund implementation projects that promote economic development through recycling. Projects designed to implement source reduction, recycling, beneficial use/re-use, anaerobic digestion, or composting are all eligible for grant funds. The additional surcharge, a 10-cent tipping fee, has generated about $2.5 million. A tipping fee is a charge levied on a given quantity of waste received

[35] Information provided by Craig McOmie, Wyoming recycling coordinator, June 2009.

[36] House Bill 07-1288.

at a waste processing facility. Of the total, about $1.8 million has been awarded in grants and $600,000 has been used for a rebate program. The rebate program directs money back to Colorado's large recyclers, who are paying the most due to the surcharge. A Pollution Prevention Advisory Board administers the grants.[37] To date, the program has been a success. During the first grant cycle, the department received 60 applications. That number of applicants has increased to 110. The grant program sunsets in 2010; however, Colorado's Department of Public Health and Environment, Pollution Prevention Program, indicated efforts are under way to continue the program.[38] In 2008 Colorado completed a "Roadmap for moving recycling and diversion forward in Colorado: Strategies, recommendations, and implications." The report identifies gaps in the state's recycling efforts and recommends funding mechanisms and policy changes.[39]

Incentives: Colorado also offers a plastic recycling investment tax credit that is equal to 20% of the first $10,000 of net expenditures to third parties for rent, wages, supplies, consumable tools, equipment, test inventory, and utilities made for new plastic recycling technology in Colorado. The credit is available to Colorado residents only.[40]

Idaho

Recycling Rate: Idaho does not require facilities to track their recycling rates, and the state does not maintain recycling rates.[41]

Incentives: Recycling incentives include a property tax exemption for qualified equipment utilizing postconsumer waste or postindustrial waste used to manufacture products.[42] Idaho also offers a tax credit for 20% of the cost of equipment used in manufacturing products that consist of at least 90% postconsumer waste. The credit is limited to no more than $30,000 in a single tax year, and unused portions may be carried forward up to 7 years. It is nonrefundable.[43]

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[37] http://www.cdphe.state.co.us/el/p2_program/ppab.html.

[38] Information provided by Patrick Hamel, Colorado sustainability coordinator, June 2009.

[39] http://www.cdphe.state.co.us/el/p2_program/grantreports/sow1finalreport.pdf.

[40] 39-22-114.5, Colorado Revised Statutes.

[41] Information provided by Dean Ehlert, Idaho Department of Environmental Quality, solid waste program coordinator, June 2009.

[42] 63-602CC, Idaho Code.

[43] 63-3029D, Idaho Code.

Washington

Recycling Rate: Washington has been collecting recycling data since 1986 through the Solid Waste and Financial Assistance Program's annual Recycling Survey and annual reports from recycling facilities. The Department of Ecology tracks about 30 recycled materials to calculate the municipal solid waste recycling rate. In 2007, the rate was calculated to be about 43%.[44] A plan called "Beyond Waste", issued first in November 2004, is the state's long-term strategy to eliminate most wastes and the use of toxic substances in 30 years. The plan consists of five initiative areas —industrial wastes, moderate-risk waste, organics, green building, and measuring progress. A 2007 study in Washington also provided a comprehensive estimate of statewide costs and revenues from solid waste management activities and services. The study identifies gaps and limitations in existing revenue and expenditure data.[45]

Legislative Action: For the last three decades, the Washington State Legislature has explored recycling laws and incentives, establishing in state law everything from a recycling database and hotline to recycled paper goals. The Washington State Legislature in 1969 enacted a Solid Waste Management Act that placed responsibility for waste management in the hands of local government.[46] In 1989 the Waste Not Washington Act was passed, establishing waste reduction and source-separated recycling as fundamental goals for the state. A recycling goal of 50% diversion by 1995 was established. In 2002, the Legislature renewed the 50% recycling goal to be reached by 2007. The Washington Legislature continues to be active in the area of recycling legislation. The 2006 Legislature approved an extensive e-waste program. The 2007 Legislature approved House Bill No. 2056 requiring vendors to provide recycling services at official gatherings and sports facilities located in communities where there are established curbside or other recycling services and programs.[47]

Incentives: There are a wide variety of recycling incentives in Washington. Those incentives range from grant and loan programs to variations in permitting and revenue-sharing arrangements for varying types of entities. The Department of Ecology administers a Coordinated Prevention Grant program that helps local government develop, enforce, and implement solid waste management plans. The grant program is funded by the Model Toxics Control Act.[48] Motor vehicles are exempt from rate regulation when transporting recovered materials from collection to reprocessing

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[44] http://www.ecy.wa.gov/programs/swfa/solidwastedata/recyclin.asp.

[45] http://www.ecy.wa.gov/beyondwaste/BWDOCS_consultantStudy.pdf.

[46] Chapter 70.95, Revised Codes of Washington.

[47] 70.93.093, Revised Codes of Washington.

[48] 70.105D.070, Revised Codes of Washington.

facilities and manufacturers. Various permitting and reporting requirements for recyclers are also established.[49] A "Pay as You Throw" program is also regulated into the local solid waste rate structures and is regulated by the Washington Utilities and Transportation Commission.

[49] 70.95.430, Revised Codes of Washington.

Funding Mechanisms

Solid Waste Fees

Solid waste management facilities in Montana are regulated by the Solid Waste Management Act and the administrative rules promulgated under the Act. DEQ's Solid Waste Program oversees the implementation of the Act. The program licenses, regulates, and provides compliance assistance to the solid waste management facilities in the state. In 1993 the program received approval and program authority to adopt and implement the federal EPA RCRA Subtitle D regulations into the solid waste administrative rules. The federal regulations provided nationwide standards for the siting, design, and operation of municipal solid waste, or Class II landfills in Montana.

In the early 1990s, the Montana Legislature approved a series of bills that dealt with solid waste management and fees in Montana. The 1991 Legislature authorized license application, renewal, and license transfer fees to pay for solid waste programs. A solid waste management system must be licensed by the DEQ's solid waste program. The annual license renewal fees range from $480 to $4,200 depending on the type and size of the facility. In addition to the annual license renewal fees, each facility is required to pay 40 cents per ton of solid waste disposed of or incinerated per year.[50] A list of the different solid waste facilities is included in **Table 2**.

Table 2: Solid Waste Facilities in Montana *Source: Montana DEQ*

Number of tipping fee paying solid waste management facilities in Montana	
Classification	**Number**
Class II Major	11
Class II Intermediate	13
Class II Minor	9
Major Transfer Station	5
Minor Transfer Station	5
Large Composters	5
Major Soil Treatment Facility	4
Class III Major	16
Class III Minor	38
Class IV Major	1
Class IV Minor	1

[50] Administrative Rules of Montana, 17.50.411.

During the 2009 fiscal year, the fees are expected to generate $713,726 for the state. Of that total, operating and personnel expenses are projected at $592,971. Operating expenses also include about $80,000 per biennium that is paid through the Montana Association of Counties for training programs for local solid waste managers and operators. Of the fees, $135,658 is transferred to the DEQ's Planning, Prevention, and Assistance division, which includes the state's waste reduction and recycling program. About $39,131 of the total is transferred to the DEQ's attorney pool.

The base solid waste annual, renewal, and transfer fees were last increased in 2005. The tonnage fee was also increased from 31 cents to 40 cents per ton at that time. The increase was vetted through the Solid Waste Advisory Committee and then approved by the Board of Environmental Review. The above-mentioned fees have allowed the solid waste program to maintain a consistent funding source for operating and personnel expenses. The program also received $123,000 in general fund appropriation to cover program administration.

When contemplating recycling and solid waste costs, the costs of a landfill also must be reviewed. The information included is based on the development, design, construction, collection, digging, and engineering costs for a new landfill. All new landfills must comply with EPA regulations. The average cost for a Class II landfill is:

- Fully lined (artificial liner): $580,000 — $635,000 per acre
- Clay liner only construction: $250,000 — $255,000 per acre
- No migration landfill: $155,000 — $175,000 per acre

The DEQ estimates that if the costs are amortized over a landfill's lifetime, landfill costs are about $4 to $10/ton of trash that is buried. If one anticipates recycling costs based on space saved at a landfill, diverted waste saves $4 to $10/ton of trash that is not buried, plus transportation costs. (Example: 100 tons of cardboard diverted = $400 to $1,000 saved in landfill costs.)

Monitoring costs also must be considered at a landfill. Monitoring must be done to detect any contaminants entering ground water because of leachate produced at landfills. Ground water testing and methane monitoring are required. Communities that contract for such monitoring, pay about $20,000 to $40,000 a year. Wells must be sampled, and sampling must be done twice a year.

The 2006 IWMP recommends implementation of full-cost accounting and reporting at landfills. "Local waste managers should set garbage disposal fees based on a full-cost accounting method. It differs from the common current practice in which fees are largely based on operating costs only. It requires local governments or private landfill operators to estimate future costs and set up reserves."[51]

[51] "Integrated Waste Management Plan (IWMP) 2006", Montana DEQ, Air, Energy and Pollution Prevention Bureau, September 2005, page 40.

Additional General Fund

The DEQ's Energy Prevention and Pollution Bureau is responsible for increasing recycling at the state level. General fund revenues for the bureau in fiscal year 2009 were $146,000, with roughly $90,000 focused on supporting the Integrated Waste Management Act and $56,000 for supporting general recycling activities, such as the issues outlined in S.J. 28.

The 2007 Legislature approved House Bill No. 555, which also directed additional funding toward recycling. The bill provided $16,500 for electronics recycling education. The department is required to implement a statewide household hazardous waste public education program, as noted earlier in this report. The electronic waste recycling education program was included in those duties.

Additional Fees — Curbside Pickup

Bozeman initiated the first municipal curbside pickup program in Montana. The program started December 1, 2008. For $10 a month, city residents who are solid waste customers can have recyclables picked up once a week. The city collects paper, plastics 1 through 7, tin, aluminum, and cardboard. Businesses also can participate but are required to separate recyclables and can acquire larger boxes at an additional cost. A recycling truck, which the city purchased for about $200,000, collects the 18-gallon buckets. The operator sets the bucket on a rack, where it is separated and placed into one of four compartments in the truck. The recyclables are taken to Four Corners Recycling in Belgrade. "The key to recycling in the state of Montana is having a processor within 30 miles," said Steven Johnson, superintendent of Bozeman's Solid Waste Division.[52] "If you don't have a processor within 30 miles, it doesn't make sense."

Bozeman estimated that it needed 800 customers to break even on the curbside recycling endeavor. The city, as of late June 2009, had 771 customers and had 800 customers by August. "People respond to opportunity and access more than laws and mandates," Johnson said. The city paid for the truck using solid waste funds that had accrued because the city operated a landfill. The landfill, which closed June 30, 2009, generated excess revenue.

The city of Helena offers a limited curbside pickup program, allowing residents to pick up "blue bags" and collect aluminum, steel, newspapers, and magazines. The city picks up the bags on the first Monday of the month.

There are a number of private recycling firms in Montana that offer curbside recycling pickup programs — primarily in larger communities. Earth First Aid Recycling in Billings, for example, charges a setup fee of $35 and $11.50 a month to residents. Service is

[52]Information provided by Steven Johnson, June 2009.

provided twice monthly in conjunction with a resident's regular garbage pickup schedule. Paper, plastic, aluminum and steel cans, and corrugated cardboard are collected. Missoula Valley Recycling offers curbside pickup for $12 a month. Paper, cardboard, aluminum and steel cans, and various plastics are accepted.

Pay as You Throw

Pay as You Throw (PAYT) is the concept of treating household trash the same way utilities treat electricity or gas consumption. Residents pay for solid waste based on the amount each resident throws away. The idea is to recycle more and generate less waste. Typically, a resident is charged based on each bag or can of trash that is thrown away.[53] In 2006, there were 14 PAYT communities in Montana, representing about 5% of all the communities in the state, according to the EPA.

"Ultimately, PAYT can help reduce the burden on the disposal system and lead to more efficient resource use, reduced environmental burden, and lower long-run solid waste system management costs. The programs enhance community recycling and waste reduction programs."[54] There are different types of PAYT programs noted in **Table 3**.

In 1991, Bozeman implemented a PAYT program — the first in Montana. Initially Bozeman used a "tag and bag" system where residents put tags on bags of garbage that were collected. Tags were sold for 20-pound or 30-pound bags and were tracked. Items that didn't fit into bags were tagged based on estimated weight. Bozeman now offers residents totes of 35, 65, or 100 gallon for waste disposal. Those who have a 35-gallon tote can choose from weekly or monthly pickup, with fees scaled accordingly.[55]

The Lincoln Refuse District container site is another example of a community that put the PAYT system to work. In the early 1990s, new EPA rules for waste disposal left Lincoln with no option but to close its 30-year-old landfill. A container site operated by an outside contractor was selected, and a computerized system was developed to operate at the site.[56] Residents haul their own waste to the site, where waste is separated by type. Those who use the site have a card that is scanned when they visit the site. The volume of the waste is also estimated and entered into a computer. The amount of waste taken to the site by each cardholder is totaled annually, and corresponding dollar amounts are sent to the county assessor and added to tax bills. A cardholder then pays only for the amount of waste disposed of during the year.

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[53] http://www.epa.gov/waste/conserve/tools/payt/index.htm.

[54] "Pay as you throw (PAYT) in the US: 2006 Update and Analyses", EPA Office of Solid Waste and Skumatz Economic Research Associates, Inc., December 2006, page 8.

[55] http://www.deq.state.mt.us/recycle/PAYT/BozemanPayt.asp.

[56] "Pay a$ you Throw . . . works for Lincoln," Montana DEQ, April 1998.

"One benefit of the system is that it encourages recycling. A rural recycling cooperative placed containers in Lincoln to collect aluminum and steel cans and newspapers."

Those living in the Scratch Gravel Solid Waste District in Helena pay an annual assessment on their tax bill for disposal of solid waste at the City of Helena Transfer Station. They pay only for the solid waste they dispose of, unlike other county residents who receive a permit and can dispose of up to 1.5 tons annually without paying an additional fee.

Table 3: PAYT Programs

PAYT Programs	
Program	**Description**
Variable or Subscribed Can	Customers select the number or size of a container for their standard disposal amount. Rates are set according to size and rate of pickup.
Bag Program	Customers purchase bags imprinted with a certain logo, such as a city or hauler. The bag cost incorporates the cost of collection, transportation, and disposal of the waste in the bag.
Tag or Sticker Program	Almost identical to the bag program, except instead of using a special bag, a tag is fixed to the waste that the customer wants disposed. Tags are usually good for 30-gallon increments, similar to the bag program.
Hybrid System	Instead of receiving unlimited collection for a monthly fee or annual assessment, the customer gets a smaller, limited volume of service for a set fee. Disposal of anything extra is only available using a program like the tag or bag system. This serves as an incentive for large disposers to reduce if the fee-based volume is set appropriately.
Weight-based System	This is called a "garbage by the pound" system and uses truck-based scales to weigh garbage containers and waste. On-board computers record waste per household, and customers are billed on that basis. This system is only used in one U.S. community.

Source: U.S. EPA

Grants

During the 2007-08 interim, the EQC discussed creating a recycling and waste reduction grant act, similar to the Colorado grant program discussed above, to create more markets for recycled materials.
Grants would have been used to assist in purchasing equipment, promoting the expansion of waste reduction and recycling businesses, researching and demonstrating how waste reduction and recycling can be applied to Montana markets, assisting in market development activities that develop local uses for recycled materials, and conducting educational activities.

Two alternative funding mechanisms were reviewed to provide about $440,000 for the program. The first funding mechanism was a fee of 35 cents per ton on solid waste. The

second funding mechanism would have allocated 1.2% of the coal severance tax revenue to fund the program.

With the downturn in the economy, the EQC ultimately agreed not to pursue this concept during the 2009 Legislative Session.

Loans

The EQC has explored the concept of a recycling loan program and pursued House Bill No. 35 during the 2009 Legislative Session. The bill proposed to create a loan program to assist political subdivisions of the state, including local and tribal governments, and private entities in developing recycling technologies and equipment at local landfills.

The bill created a $1 million recycling equipment revolving loan account to the credit of the DEQ. The money was a one-time transfer from the junk vehicle disposal fund into the new account. Loans of up to $50,000 could have been offered to assist in the purchase of equipment and machinery. The bill died.

Extended Producer Responsibility (EPR)

States and local governments are implementing a growing number of waste reduction programs that require producers to integrate "cradle to grave" expenses into the product cost. This is an issue that is discussed in greater depth in the e-waste portion of this report. An EPR program means that designers, suppliers, manufacturers, distributors, retailers, consumers, recyclers, and disposers take responsibility for the environmental and economic impacts of a product. Montana has some EPR programs.

- **Mercury-Added Thermostat Collection Act** (75-10-1501, MCA) Senate Bill No. 424, approved by the 2009 Legislature, requires thermostat manufacturers to create a take-back program to reduce mercury pollution caused by improper disposal of thermostats. The program launched in 2010. After January 1, 2010, thermostats that contain mercury may not be offered for sale in Montana.
- **Department of Agriculture and DEQ** work with producers to collect and recycle unused pesticides. The DEQ works with national associations that operate a voluntary take-back program for plastic pesticide containers.
- **The Rechargeable Battery Recycling Corporation** provides free recycling and partners with retailers, like Radio Shack, to place drop-off bins in their stores.
- **Electronics manufacturers** have created take-back programs that are operational in Montana.

Other Funding Sources

The 2007-08 EQC also reviewed a proposal to increase the allocation to the Montana Manufacturing Extension Center from $200,000 to $300,000 (through extension of the coal severance tax allocation). The draft required that 35% ($105,000) of the Montana Manufacturing Extension Center funding be used in collaboration with the DEQ to encourage manufacturers and commercial business owners to recycle. The bill died, and ultimately the allocation of coal severance taxes was extended through June 2019, with the current $200,000 going to the Montana Manufacturing Extension Center. At the direction of the EQC, staff followed up with the Montana Manufacturing Extension Center and inquired about their interest in working with DEQ on recycling. The Center's response is included in **Appendix E**.

Stimulus

The federal American Recovery and Reinvestment Act of 2009 included money to assist recycling efforts in Montana. The DEQ's State Energy Program awarded about $300,000 in recycling infrastructure grants. Local governments, nonprofit organizations, and private entities applied for grants to develop the recycling infrastructure in Montana and achieve greater recycling rates. Applicants had to show that they would increase tonnage recycled and show a measurable reduction in energy used for the manufacturing of goods. The DEQ received 44 applications for a total of about $1 million in requests. The DEQ awarded grants to 19 applicants. The awards are listed in **Table 4**. In the next interim, the EQC would like to learn more about how communities used the recycling infrastructure grants. The EQC believes it would be useful to learn more about how the grant money increased tonnage recycled and reduced energy used in the manufacturing of goods. This information would provide legislators with valuable data on the usefulness of these types of grant programs when considering future proposals.

Table 4: ARRA Recycling Grants

Recycling Infrastructure Grants		
Applicant	**Amount**	**Explanation**
Lincoln County Department of Environmental Health	$25,000	Recycling trailers to be placed in Libby and Troy.
Palindrome Products — Missoula	$25,000	A densifier to process recycled plastic.
Flathead County Solid Waste District	$25,000	Compactor for cardboard collected at Columbia Falls site.
Lake County Transfer Station	$24,867	Three compartmentalized roll-off bins to be placed in St. Ignatius, Ronan, and Polson areas.

Recycling Infrastructure Grants		
Applicant	**Amount**	**Explanation**
Granite County	$24,590	Two balers for county collection sites.
City of Polson	$22,380	Communitywide collection bins. A trailer to haul material to recycler.
Earth First Aid — Billings	$21,000	Roll-off bins for collection from rural areas.
City of Shelby	$18,900	Recycling trailer, collection bins for schools, hospitals, employment hubs, and educational campaign.
Powder River County	$16,340	Baler and collection bins.
Home ReSource — Missoula	$16,156	Equipment to prepare items for reuse. (Only construction and demolition waste applicant.)
City of Bozeman	$14,117	School districtwide recycling program. A professional video developed as a training tool.
Lincoln Solid Waste District	$14,000	Baler, concrete pad, and shed cover. No glass crusher.
Augusta Solid Waste District	$14,000	Baler, concrete pad, and shed cover. No glass crusher.
City of Colstrip	$13,775	Baler, collection bins, and educational campaign.
Broadwater County	$12,500	Roll-off bins for collection of cardboard.
Broadwater County Development Corporation	$12,500	A cardboard baler.
Associated Students of Montana State University	$4,660.59	Recycling bins to be used at special events including sporting events and concerts.
Hill County	$3,200	Recycling bins for office paper.
Headwaters Cooperative Recycling	$3,150	Crane scale and floor scales so cooperative can work on a hub system with Lincoln and Augusta solid waste districts.

Rural Recycling Challenges

Recycling in rural communities can often be an uphill effort. Montana's rural nature is one of the greatest challenges in advancing recycling efforts across the state. Obstacles include distance to recycling centers, lack of economies of scale, and lack of funding. Numerous efforts are moving forward to give the residents of smaller communities the opportunity to recycle common household items. The DEQ addressed the EQC in September of 2009 and discussed efforts to promote rural recycling opportunities. The presentation is included in **Appendix F**.

A Case Study: Eureka, MT

Eureka is located in the Tobacco Valley about 65 miles from Kalispell. The 2000 Census listed the population at 1,017. In late 2007 a handful of residents initiated a program that evolved into the nonprofit, volunteer effort "Recycle Eureka" to encourage recycling in the small community — a community that is about 70 miles from the nearest recycling center.[57] Recycle Eureka illustrates the ups and downs experienced by one rural Montana community in developing a successful recycling program.

Shortly after forming, in January 2008, Recycle Eureka connected with the DEQ. The two entities started researching options and reasons recycling programs hadn't worked in the past in the Tobacco Valley. They found the top three challenges for rural recycling to be:

- Lack of funding
- Market
- Reliance on volunteers

"The public perception in our area was that recycling efforts didn't work and were at best only embarked on by a bunch of tree-hugging, left-wing liberals who didn't have good business judgment," said Carole Tapp, who led the volunteer effort in Eureka.[58] "So we attempted to learn from history and vowed not to repeat it. And even though we were a nonprofit organization, we approached Recycle Eureka with a strictly business and marketing mind set."

Recycle Eureka started an outreach program by contacting the local newspapers, school board, and civic organizations and developing a website. The group worked closely with the school district, involving local students, and also launched an e-waste program in the spring of 2008 to raise money and awareness.

[57] http://www.recycleeureka.com/.

[58] Waste Not Montana Conference, Billings, May 2009.

Initially volunteers looked at purchasing a 30-yard roll-off container that would be hauled to Kalispell or Libby and emptied twice a month. However, the container would have come at a projected annual cost of $12,000 and, based on estimated recycling efforts, would have generated only about $2,600 annually. Volunteers were faced with finding a way to triple the amount recycled in the community for each shipment in order to have a self-sustaining program. The group also investigated purchasing a vertical baler (equipment to bale recyclables) and found it would be cost-prohibitive. "I was trying to bring a city recycling mentality to a remote, rural community, and it just didn't work, mainly due to geography, being a border town, and having a sparse population," Tapp said.[59]

Figure 6: Supersacks
Photo courtesy of Carole Tapp.

Volunteers turned their focus to working with the post office in Eureka to initiate a campaign to stop junk mail at the source. Flyers were circulated in the community showing people how to register online and stop junk mail. The DEQ also suggested the Eureka volunteers start out with quarterly recycling drives and assisted the group in acquiring "supersacks" or lightweight, large, easily transportable containers for the drive. In August 2008, the first recycling drive resulted in the collection of plastic, paper, cardboard, aluminum, tin, and e-waste. Recyclables were separated and loaded into the supersacks and hauled to Kalispell — with the exception of cardboard. The cardboard had to be broken down and separately baled, a time- consuming process according to volunteers.

Figure 7: Cardboard recycling.
Photo courtesy of Carole Tapp.

Eureka, however, had caught the recycling bug by that time. The post office initiated a program to recycle junk mail and newspaper left at the office. The school district formed a recycling committee to address paper recycling efforts. Recycle Eureka started planning for its next quarterly recycling drive.

The group also learned that Stein's Family Foods in Eureka was building a new store and planned to acquire a vertical baler to

[59] Waste Not Montana Conference, Billings, May 2009.

handle its cardboard waste. Lincoln County officials agreed to donate two used bins that would be set behind the new store and open for cardboard collection. As of mid-2009, Stein's had recycled 103,000 pounds of cardboard since December 2008.
Recycle Eureka continues its efforts to improve recycling opportunities and spread the word about recycling. Volunteers have a strategy for meeting the three challenges noted above:

- Lack of funding
  - applying for multiple grants
- Market
  - tracking current efforts to determine their effectiveness
- Volunteer effort
  - working with the county to establish a permanent drop location

Hard Times: Flathead County, MT

During the last 12 years, Flathead County has made a profit only twice while operating its recycling operation. Those were good years, when commodities were up. That, however, doesn't mean that recycling is a losing endeavor in Flathead County.
For the last 12 years, the program has continued to grow every year. The county, in late 2008, took over recycling bins previously operated by the city of Kalispell and has stepped in in other areas of the county because Evergreen Disposal is no longer providing recycling services.

In 2009, the county expected to collect 2.3 million pounds of recyclables, compared to 1.9 million pounds in 2008 and 1.3 million pounds in 2007. The financial picture, however, doesn't match up. The county expected to lose $110,000 in 2009, compared to $33,761 in 2008 and $1,580 in 2007. While recycling doesn't pencil out financially, the county continues because there is a public demand and because it also saves space in the public landfill, said Public Works Director Dave Prunty.

"In a pure profit and loss scenario, our expenses are more than our revenues," Prunty said. "But our program continues to grow each and every year. Our board of directors firmly believes that the district has an obligation to provide a service for recycling to our ratepayers."[60]

The county contracts with Valley Recycling, a private recycler, in order to place recycle bins at various collection sites. Valley Recycling charges a rental fee on the bins and charges for hauling, processing, and marketing the materials. The county gets the revenue from the recyclables that are sold.

Recycling efforts are largely focused on cardboard, newspaper, aluminum, and a few other items. Glass is not recycled, simply because there is no nearby market for it.

[60] Information provided by Dave Prunty, August 2009.

There are no bottling plants in or near Montana, which are the most common purchasers of crushed glass. Recycling glass in Montana often means costly out-of-state treks. Prunty also notes that glass is something that when crushed takes up relatively little landfill space.

"We have commodities that have a greater value that take up far more space," he said. "Let's focus on that."

In June 2009, however, because of declining commodity prices, the county lost $11,241 in its recycling efforts. During that time period, the county collected 229,223 pounds of recycled material, generating $7,530 in revenue. The costs to haul and handle the materials, along with the site maintenance and bin rentals, totaled $18,469.[61]

Prunty said in the future, he is hopeful that the program will become more cost-effective. And overall, the losses aren't a burden to ratepayers — in budgeting, the program is not expected to be profitable. The loss also factors out to be less than 2% of operational expenses.

Flathead County's landfill has an estimated 45 to 50 years' worth of space remaining, depending on the amount of trash generated in the expanding county. The estimates are based on a 2% to 4% growth rate. Prunty notes that at one time the county had 16% growth in 1 year and most recently felt a 15% contraction.

Flathead County, however, isn't the only one in the recycling business in the area. There are private recyclers like Valley Recycling, which recycles about 8 million pounds a year according to manager Bob Morrow. They collect cardboard, mixed paper, some plastics, aluminum cans, and nonferrous metals. Most of the material is taken to markets on the west coast. Morrow said hauling costs are the most expensive aspect of the process. Higher gas prices and tanking commodities have taken their toll in the last year.

"It's mostly a loss," he said. "We don't make a lot of money, but we do it as a service."[62]

There are also at least two curbside recycling entities in Flathead County. New World Recycling started offering the service 7 years ago, when owner Cory Cullen used a $5,000 loan to begin business. Cullen charges $10 a month for residential curbside pickup and $15 a month for pickup that includes glass. He initially would drive glass to Idaho, where it was used in a road reconstruction project. He later built his own glass crusher. With a $25,000 loan, Cullen purchased a glass pulverizer. He averages 400,

[61] "County recycling program losing money," *Daily InterLake*, August 2009.

[62] Information provided by Bob Morrow, August 2009.

32-gallon garbage cans a month — an estimated 0.5% to 1% of the glass in the valley.[63] In July 2009, he collected 647 garbage cans of glass. The markets for glass cullet and glass aggregate are slowly growing. Cullen is working to connect with a concrete business owner to use cullet to make countertops.

A "Freecycle Flathead" website also is maintained in Flathead County, allowing, among other things, residents to post information about items they wish to "recycle" or get rid of. The site is open to all county residents and is not a charity or online shopping service. It serves as a type of information resource for those looking to give an item a second life (reuse) or find a used item. The site has more than 1,400 users.

[63] "Shattering obstacles to glass recycling," *Flathead Beacon*, April 2008.

Markets and Conclusion

In 2007 recycling markets were riding high, but in lockstep with the global recession that hit in 2008 and 2009, markets tanked. As the economy plummeted, prices plummeted by as much as 80% for some recyclables like cardboard and plastic jugs. Cardboard that had sold for $100 a ton was worth only $25 a ton. Aluminum cans that were 55 cents a pound dropped to 17 cents a pound. In late 2009, Montana aluminum prices were about 30 cents a pound and cardboard was at $60 a ton. When the industry takes a hit because of poor prices, local governments that operate recycling services also feel the pinch. "One reason prices slid so rapidly this time is that demand from China, the biggest export market for recyclables from the U.S., quickly dried up as the global economy slowed," according to the DEQ.

When consumer demand for new homes, cars, and other goods declines, so does the need for steel and fiber — which in many cases come from recycled scrap, paper, and other materials. In a declining economy, recyclers face a greater challenge in finding buyers for their goods. "The well-documented problems in the auto and housing industries have helped push aluminum inventories to a 14-year high of around 2 million metric tons, according to one report."[64]

Figure 8: The only opportunity for residents of Helena to recycle plastic bottles is through collection drives held the first weekend of every other month. Student Advocates for Valuing the Environment Foundation (S.A.V.E.), a Helena based non-profit, organizes the plastics drive. Photo by Sonja Nowakowski, EQC Staff.

According to many in the recycling industry, markets are starting to come back. Metal prices are rebounding. The "cash-for-clunkers" program, for example, generated a number of automobiles that were shredded by recyclers. Plastic prices remain low, however; those prices are generally tied to gas prices.

While recycling is often associated with local volunteers and grassroots efforts, it's also intrinsically tied to the global economy. The EQC's study came at a time when a downturn in the world economy added to existing recycling challenges. Bad economic times, however, are not expected to

[64] http://www.recyclingtoday.com/Article.aspx?article_id=21645

undermine the public's commitment to recycling. Local programs are expected to continue their efforts with the confidence that markets will rebound in the future.

Appendix A

61st Legislature SJ00028

SENATE JOINT RESOLUTION NO. 28
INTRODUCED BY J. PETERSON, LASLOVICH, ZINKE, BRUEGGEMAN, HENDRICK

A JOINT RESOLUTION OF THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA REQUESTING AN INTERIM STUDY TO EVALUATE METHODS FOR INCREASING RECYCLING AND SOLID WASTE RECOVERY WITHIN THE STATE OF MONTANA.

WHEREAS, increased recycling rates will provide substantial economic and environmental benefits to Montanans; and

WHEREAS, recycling is a value-added manufacturing process that provides jobs for Montanans; and

WHEREAS, recycling reduces energy consumption associated with the manufacturing of products from raw materials and reduces landfill usage by diverting solid waste; and

WHEREAS, rural areas have a need for infrastructure support to increase recycling; and

WHEREAS, electronic waste and household hazardous waste present unique recycling challenges that may require additional programs; and

WHEREAS, the Montana Integrated Waste Management Act proposes increasing Montana solid waste recycling rates to 19% by 2011 and 22% by 2015 using a variety of methods, including source reduction, reuse, recycling, and composting.

NOW, THEREFORE, BE IT RESOLVED BY THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA:

That the Legislative Council be requested to designate an appropriate interim committee, pursuant to section 5-5-217, MCA, or direct sufficient staff resources to:

(1) evaluate and propose potential methods for increasing the recycling rates in the state of Montana;

(2) analyze methods to promote market development of recycled materials;

(3) analyze options to address rural recycling challenges;

(4) propose programs to address electronic and household hazardous waste; and

(5) evaluate funding alternatives.

BE IT FURTHER RESOLVED, that if the study is assigned to staff, any findings or conclusions be presented to and reviewed by an appropriate committee designated by the Legislative Council.

BE IT FURTHER RESOLVED, that all aspects of the study, including presentation and review requirements, be concluded prior to September 15, 2010.

BE IT FURTHER RESOLVED, that the final results of the study, including any findings, conclusions, comments, or recommendations of the appropriate committee, be reported to the 62nd Legislature.

- END -

Appendix B

Recycling Work Plan Tasks

Council action: The EQC allocated .20 FTE for this topic. For more information on this topic, contact Sonja Nowakowski: (406) 444-3078, snowakowski@mt.gov.

x 1. Review legislative history of Montana recycling incentives, rates, and law.

Who: EQC staff, DEQ staff
Time line: September 2009 meeting

x 2. Overview of recycling funding alternatives, incentives, and role of states in promoting recycling in other Western states.

Who: EQC staff
Time line: September 2009 meeting

x 3. Discussion of rural recycling challenges.

Who: EQC members, staff, stakeholders
Time line: September 2009 meeting

x 4. Panel discussion from stakeholders.

Who: Private recyclers, local governments, nonprofits.
Time line: September 2009 meeting

x 5. Summary of e-waste efforts in Western states and efforts in Montana.

Who: EQC staff, DEQ staff
Time line: January 2010 meeting

x 6. EQC discussion and study direction.

Who: EQC members
Time line: January 2010 meeting

x 7. Summary and discussion of recycling markets.

Who: EQC staff, DEQ economist
Time line: March 2010 meeting

x 8. Presentation of preliminary report and development of recommendations and proposed legislation.

Who: EQC members, staff
Time line: March 2010 meeting

x 9. Review draft report, findings, recommendations, and any proposed legislation.

Who: EQC members, staff
Time line: May 2010 meeting

x 10. Review public comment on draft report and any proposed legislation.

Who: EQC members, staff
Time line: July 2010 meeting

x 11. Approval of final report and any findings, recommendations, or legislation.

Who: EQC members
Time line: July 2010 meeting

Appendix C

Feasibility Study Funding: Power from MSW

Proposal: Matching grants for feasibility studies for Biomass/Power/Recycling Businesses Using Municipal Solid Waste

I want to propose a legislative idea: to provide matching grants to local government/private investors to do feasibility studies pertaining to using municipal solid waste for power generation. Although the information we have received about the Envirocycler inspires this idea, the grants should not favor any particular technology.

As we have looked at recycling and at energy production from biomass, we keep seeing the same problems. With biomass, there are few opportunities to create a long term, reliable cost-effective stream of feedstock at sufficient quantities. Recycling presents similar challenges: transportation costs make it uneconomical to sort and ship our relatively low quantities of materials for processing into new manufactured goods.

Our one long-term, reliable and abundant potential feedstock already being transported to central locations is municipal solid waste, including wastewater treatment sludge. Using MSW as feedstock for energy production could have benefits such as:

- Production and sale of renewable electricity
- Reduction of land filling, with its attendant problems of pollution and permanent monitoring, and waste of usable materials (biomass, metals, plastics, glass)
- Increased stream of recyclables, including electronics and other material not suitable for incineration, such that recycling becomes more cost effective
- Reduced waste management costs for local government, perhaps even a profit as an investor or from selling the waste (aka fuel) to the power producer.
- Savings (or profits) might be used to reduce the currently prohibitive cost to consumers of keeping electronics out of the waste stream.
- Jobs, many permanent, in construction, operation, related recycling activities

The feasibility studies would have to look at:

- Life cycle issues of the waste stream from on-site waste production (home, business, waste-water plant) through transportation, energy production recycling-land filling, the usability/hazardous waste potential of the ash, all compared to costs of BAU;
- Integration of already-existing local recyclers into the overall waste-management plan;
- Ability to comply with state and federal environmental laws;
- Social considerations such as jobs, noise, view shed, public acceptance;
- Impacts on wildlife, other uses of the land, etc;
- A business plan;
- Other requirements???

Feasibility Study Funding: Power from MSW

Although each project would necessarily involve very local considerations, there are potential benefits to the state:

- Jobs and tax revenues
- Increased renewable energy supply
- New industries in power production, recycling and manufacturing
- Less land devoted to landfills
- Disposal option for excess fuels on state and private land

Things I don't know:

- Funding possibilities: might some current funding and granting source be used, or do we need some new creation?
- How much should a feasibility study and business plan cost?
- Are there other ways the state could encourage local governments and private investors to consider using MSW as a resource rather than a management problem?
- Other things that *you* know I don't know.

I think this could be included in either the recycling or biomass sections of our agenda. If the Council thinks this is worth consideration, I hope members will offer more details to improve the idea and to help the staff draft possible legislation.

Thanks for your time.

Mary E. Fitzpatrick
Billings

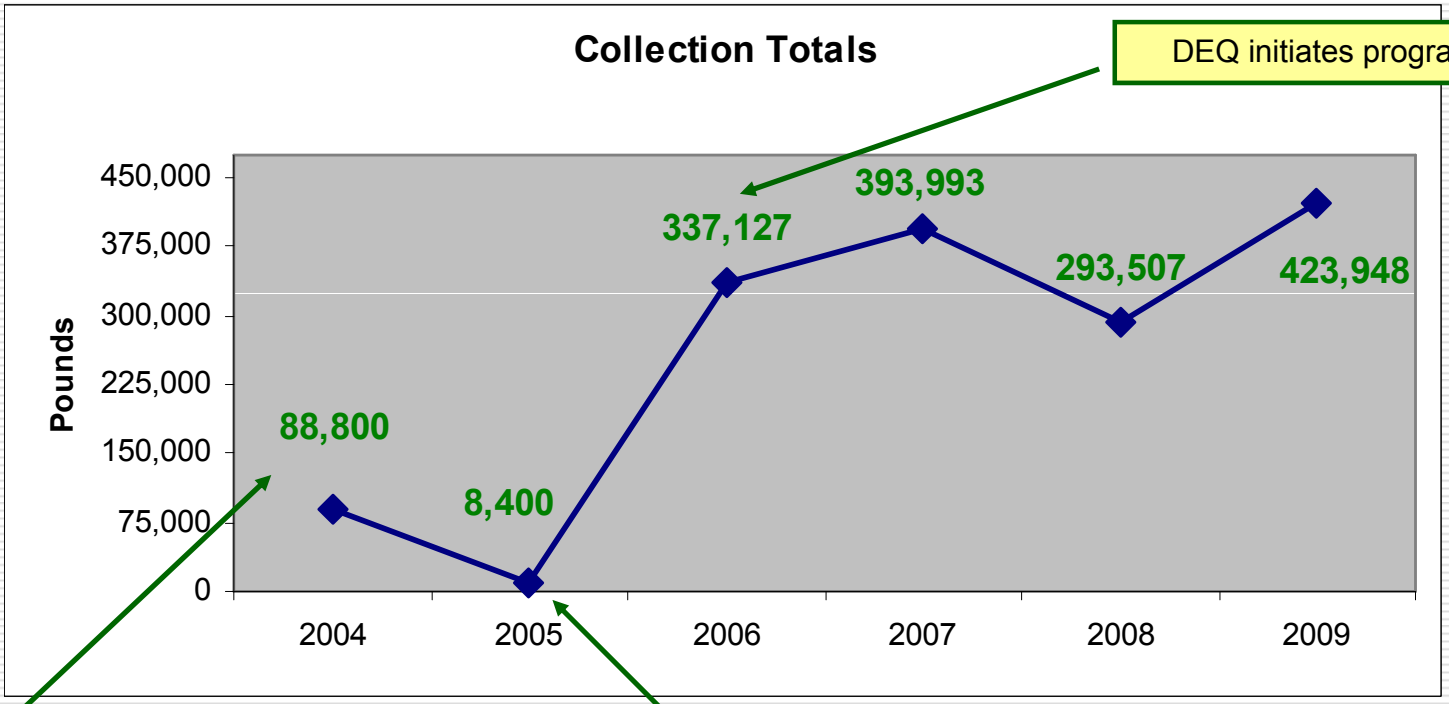
Montana Department of
ENVIRONMENTAL QUALITY

Recycling Electronics in Montana

Presented by Sandra Boggs,
Recycling and Marketing Development Specialist
www.recycle.mt.gov

Since 2004

Recycled over 1,545,775 pounds



Why Electronics?

- Valuable Materials (small amounts)
  - chromium
  - cadmium
  - mercury
  - beryllium
  - nickel
  - lead
  - zinc
  - gold
  - brominated flame retardants

- Protect land, water and air resources
- Save expensive landfill airspace
- Divert waste stream that is growing
- Take advantage of existing markets
- People want to recycle

Why DEQ?

- ☐ Protect land, water and air resources
- ☐ Save expensive landfill airspace
- ☐ Take advantage of existing markets
- ☐ Divert waste stream that is growing

- Americans own up to 24 electronic items per household. (CEA)
- EPA estimates 1.84M tons landfilled in 2007
- Almost half, or 976 million units, of all the products sold between 1980-2004 are still in use or reuse.
- EPA estimates only 10% - 15% are recycled each year

DEQ Assistance

- Relationships with Electronics Recyclers
- Financial support from manufacturers
- Assistance with education & outreach
  - Help directing public to data destruction resources
- Access to case studies and experienced community organizers
- Volunteer liability coverage
- On-the-ground assistance with event
- Initiate and support start-up of local e-scrap recycling

How did the 1st events happen?

Gallatin Co., 2004

- WQPD
- $10k Apple Grant
- Free Event
- Goal: 30k pounds
- Collected: 88,800 pounds!

34% over estimates!

Sidney, 2005

- USDA ARS, EPC
- No Grant
- Charged $0.40/Lb
- No specific goal
- Collected: 8,400 pounds!

DEQ-initiated, 2006

$1 - $15/item

- Whitefish
- Kalispell
- Missoula

Staples-Sponsored

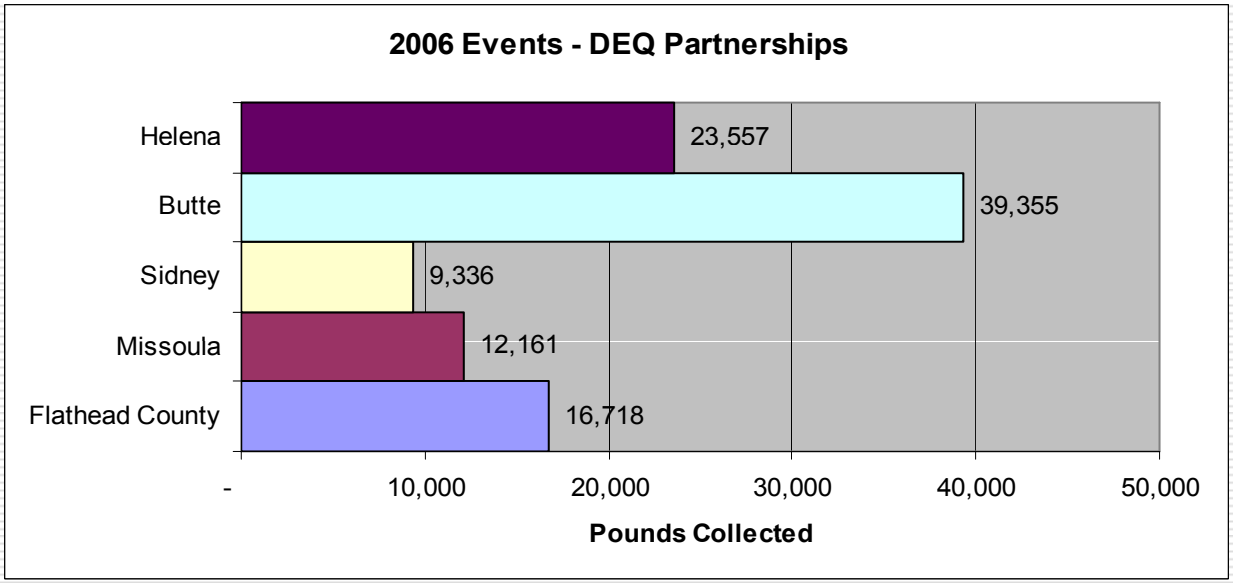
$10/item

- Butte
- Helena

Surveys (2006)

- Attitudes
- Preferences
- Willingness to Pay

2006 DEQ, EPA, Industry Partnerships



Since 2006

- Annual events continue
  - Collection Event Planning Guide
  - Free operational SW license
  - Promotional templates online (E-rase Your E-Waste, Sidney)
- Over 13 communities have held events
- Manufacturer Recycling Programs
- Retail Take-Back Programs
- Public Education & Outreach
  - $16,000 authorization and directive for education & promotion of electronics recycling
    - Television PSA & advertising piece
    - Support of local outreach & educational efforts

recycle.mt.gov

Education focuses on referring people to the DEQ website: recycle.mt.gov

- Learn about recycling
- Find calendar of annual collection events, other recycling events
- Find info on manufacturer and retail take-back programs.

2006 Surveys

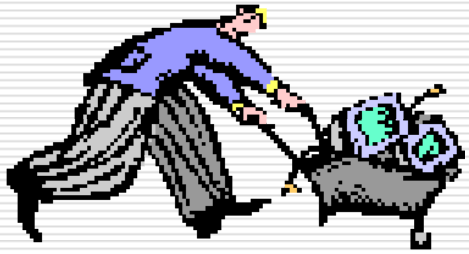
What do citizens want?

Recycling should be FREE, or

- Consumers / OEMs should share recycling costs
- No exporting
  - Even free events = would pay a fee for it
    - If such responsible recycling was promised.
- Convenience
  - Landfill, Transfer Station
  - Recycling Centers
  - Retailers

Public Recycling Options

- Annual Collection Events
- Electronics Recyclers
- Retail Take-Back Programs
- Manufacturer Recycling Programs
  - Online & Mail-in Programs
  - Drop-off Programs



How accessible is electronics recycling?

Annual Events

Pay-for-Service

- Per pound
- Per item

Subsidized Rates

- Price discounts
- Targeted items

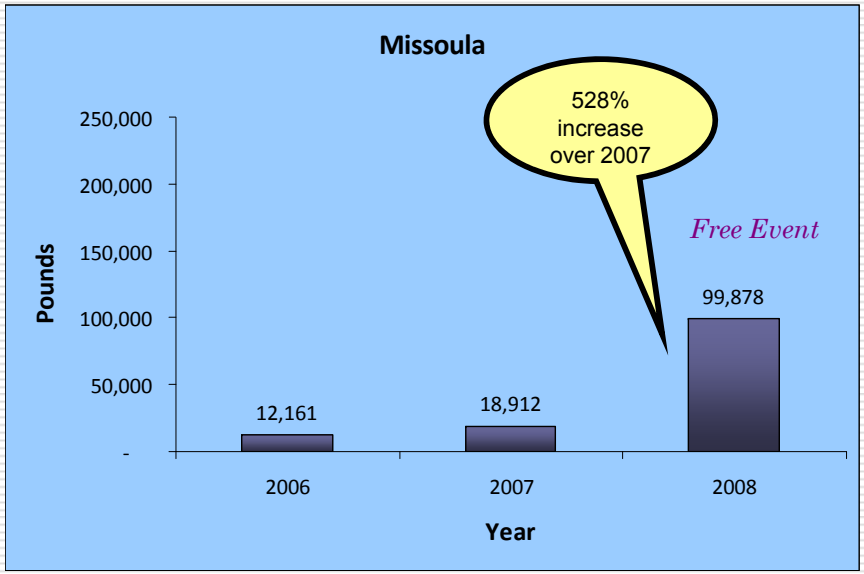
FREE

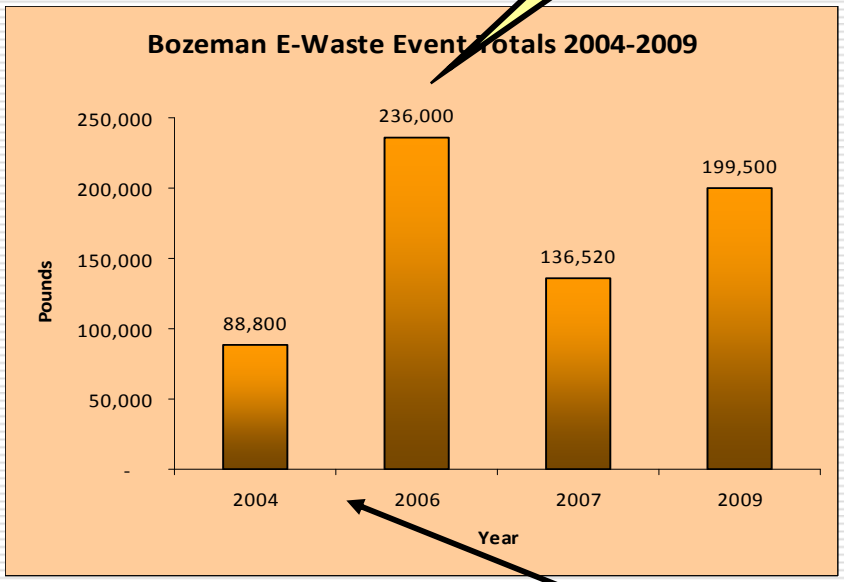
- Budget item
- Fundraising
- Sponsored

Potential fraud risks

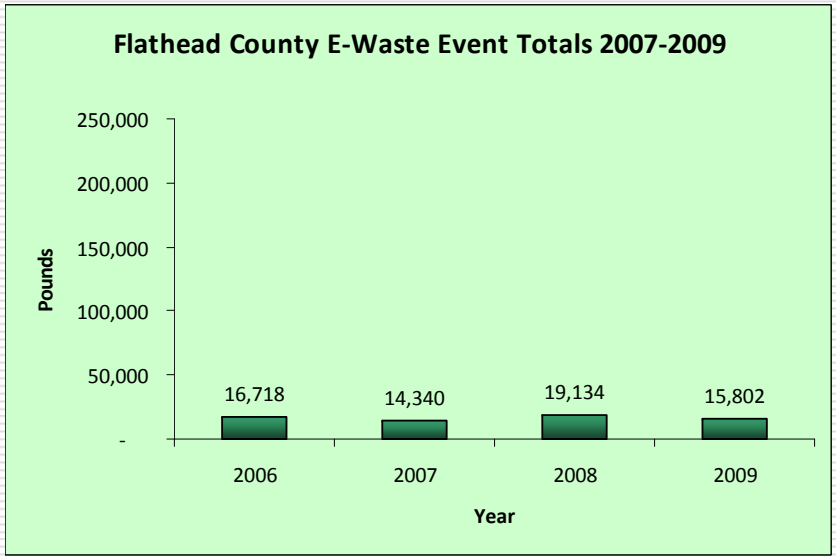
Recycling: Annual Events

Participation



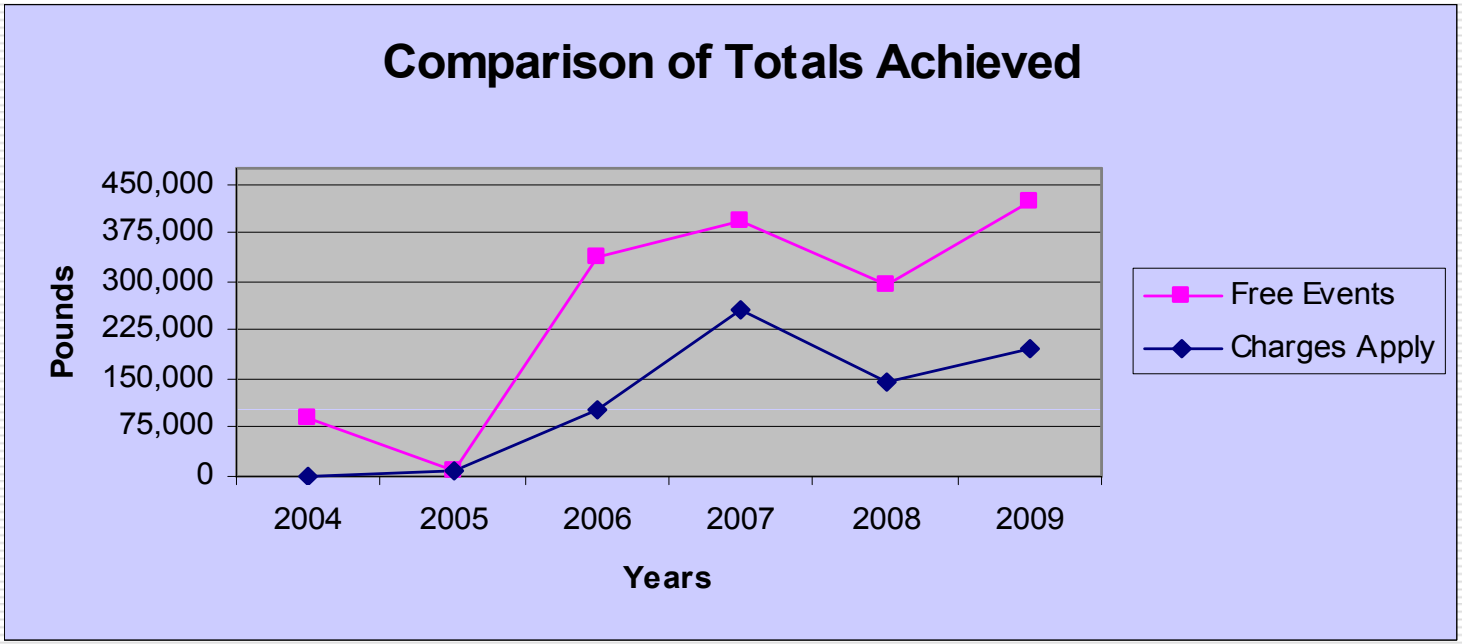


No event in 2005



Television Recycling

Collection Success



Next Look:

Electronic Recyclers in Montana

Electronic Recyclers in Montana

P.E.T.E.S. Palmer Electric

(Total ReClaim, Seattle)

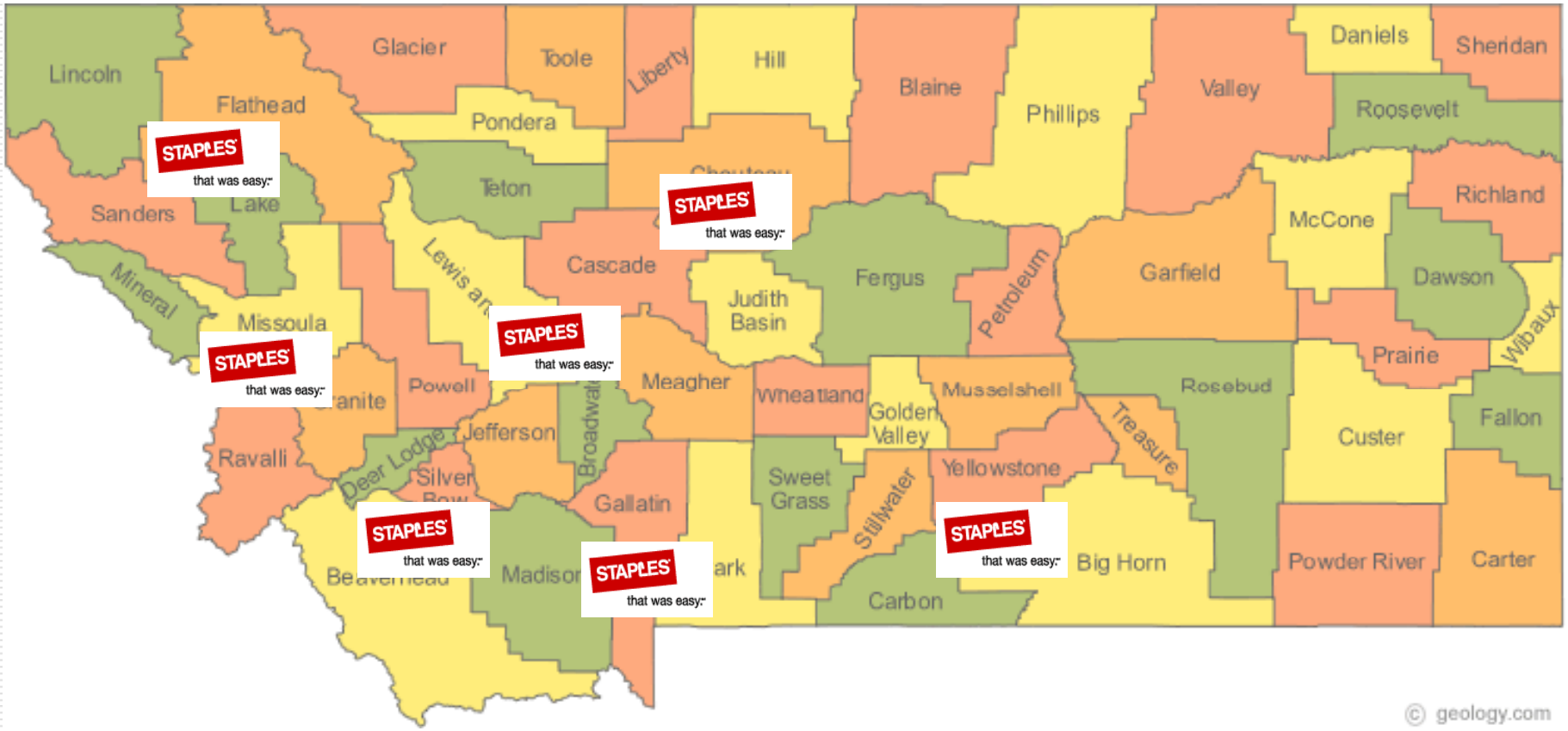
TATOOINE ELECTRONIC SYSTEMS

(Warehouse)

Retail Take-Back Programs

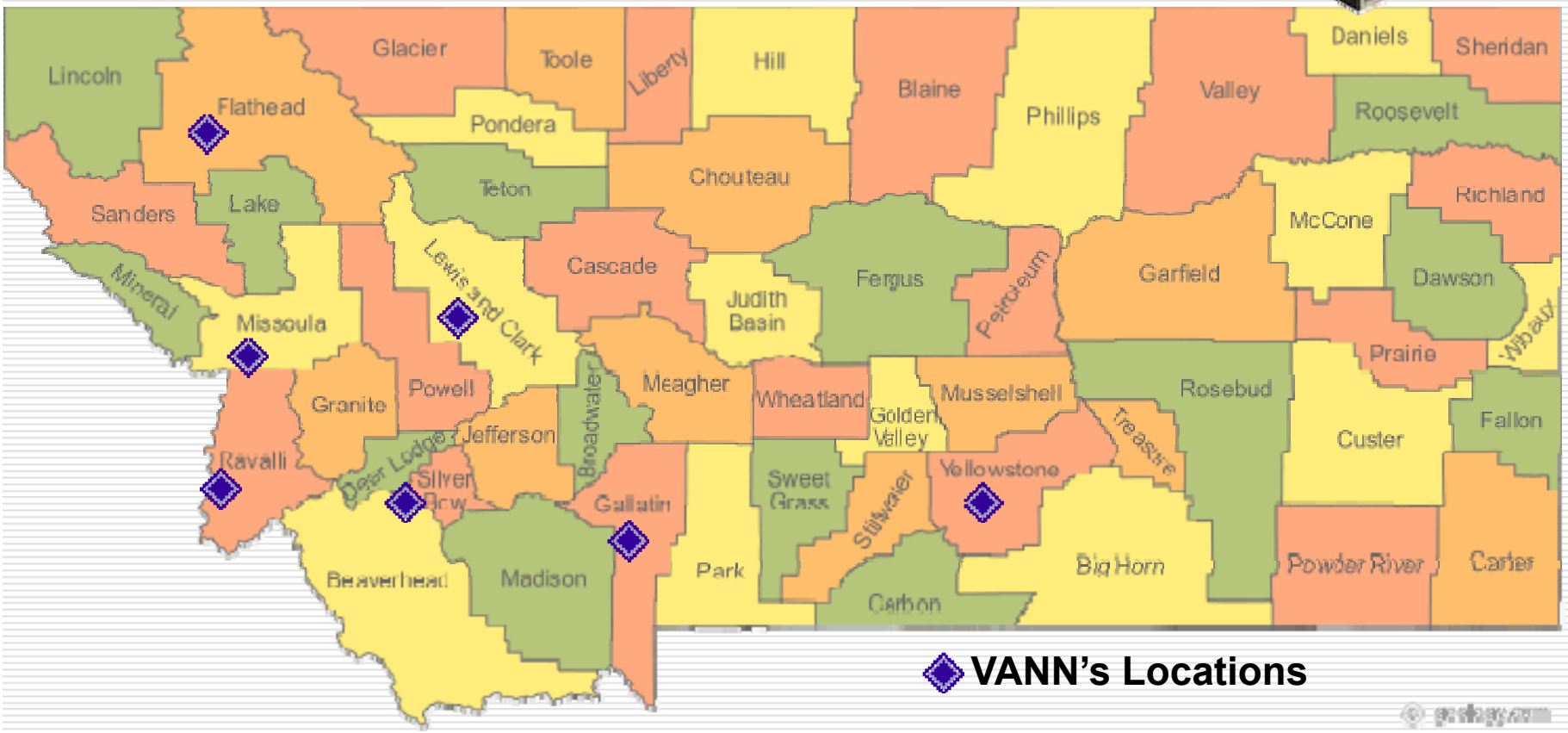
Staples

- Anything they sell
- Some items free (cellphones, chargers, PDAs)
- $10 per unit fee (printers, Desktop, copier, and more)
- No TVs or stereo equipment
- Dell-brand items FREE



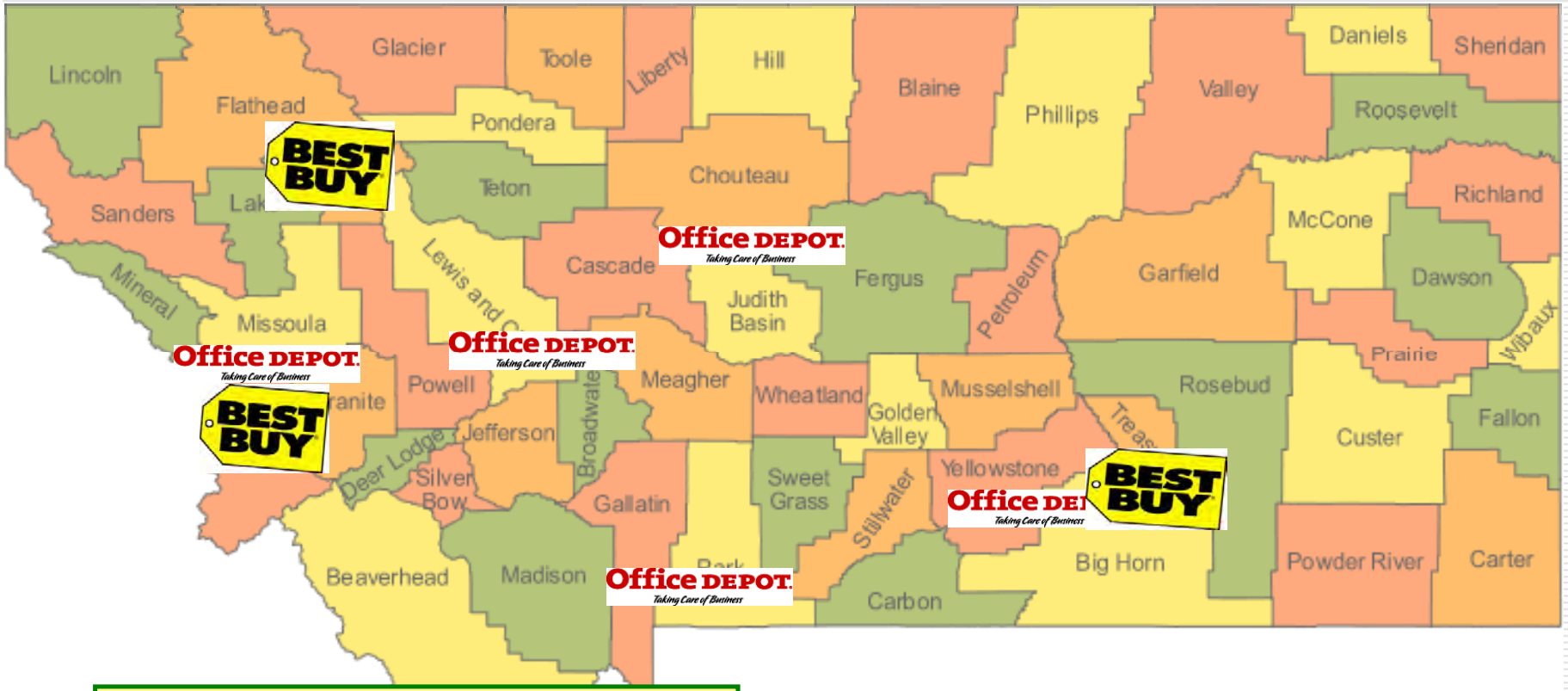
VANN's Recycling Program

- Partnership with Sony
- Small Electronics Only (any brand)
- No TVs; dropped off elsewhere for $$



◆ **VANN's Locations**

Office Depot and Best Buy



Office Depot

- Ask to purchase a recycling box: Small ($5), Medium ($10), Large ($15)
- Take home and fill
- Drop off at store

Best Buy

- Any brand; mostly free
- $10 for TVs up to 32”, monitors, laptops
- Get $10 Gift Card

Mail-in & Online Programs

Apple

- Free IF you buy a new Apple
- Lots of restrictions
- iPods, iPhones are FREE

HP

- Buys items back if still valuable (any brand, free shipping)
- HP & Compaq products always free
- Other products at no value: you pay shipping, free recycling

Dell

- Free drop-off at Staples stores
- If mailing: Free shipping & recycling

Lenovo

- Very similar to HP program

Free Drop-off Programs

MRM Recycling Program

(Electronic Manufacturers Recycling Management Company)

- ☐ Panasonic
- ☐ Sharp
- ☐ Toshiba
- ☐ Mitsubishi
- ☐ Vizio

Samsung

(WalMart brands too!)

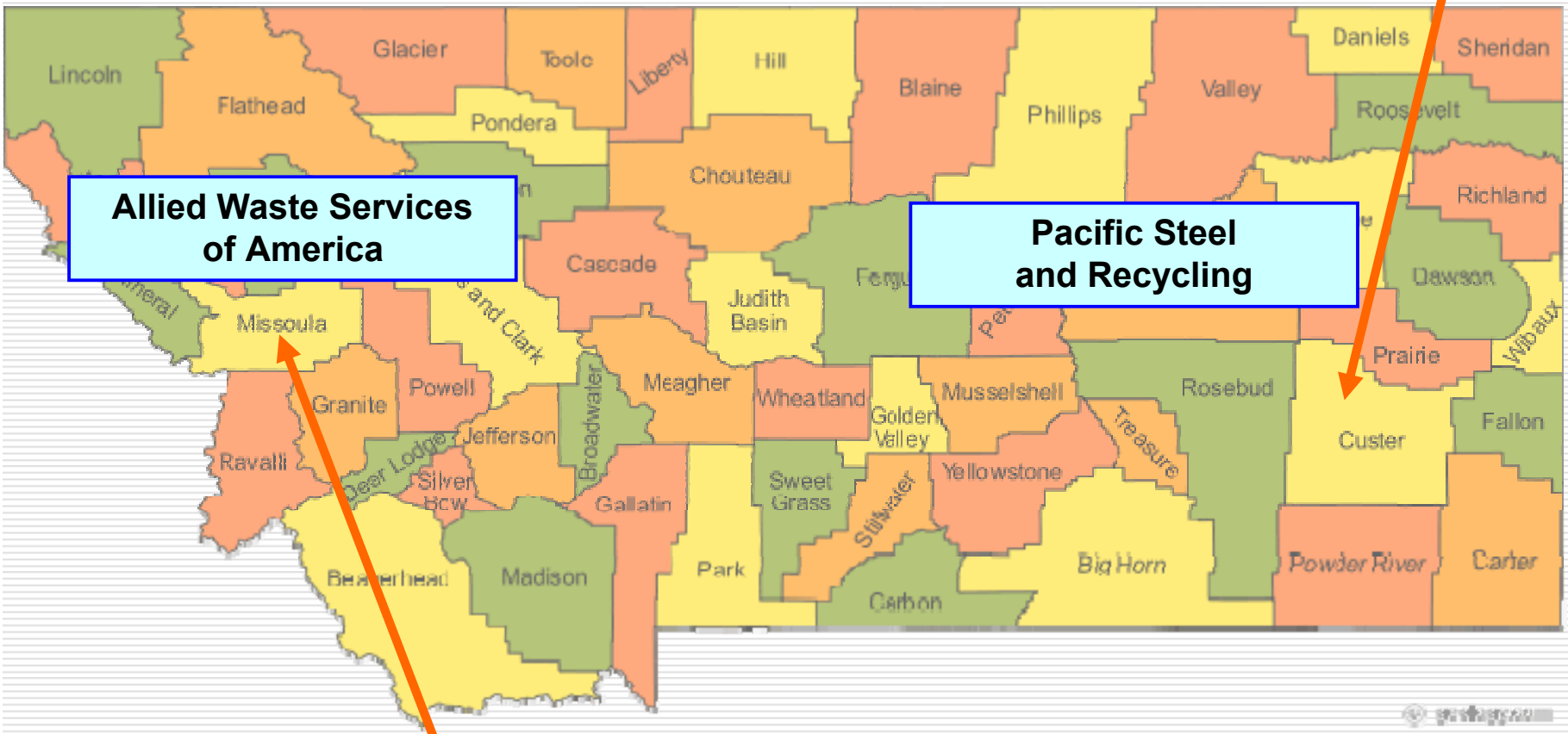
Partners with recycling companies

SONY

Partners with Retailers

Dell

Montana Locations



Allied Waste Services of America

Pacific Steel and Recycling

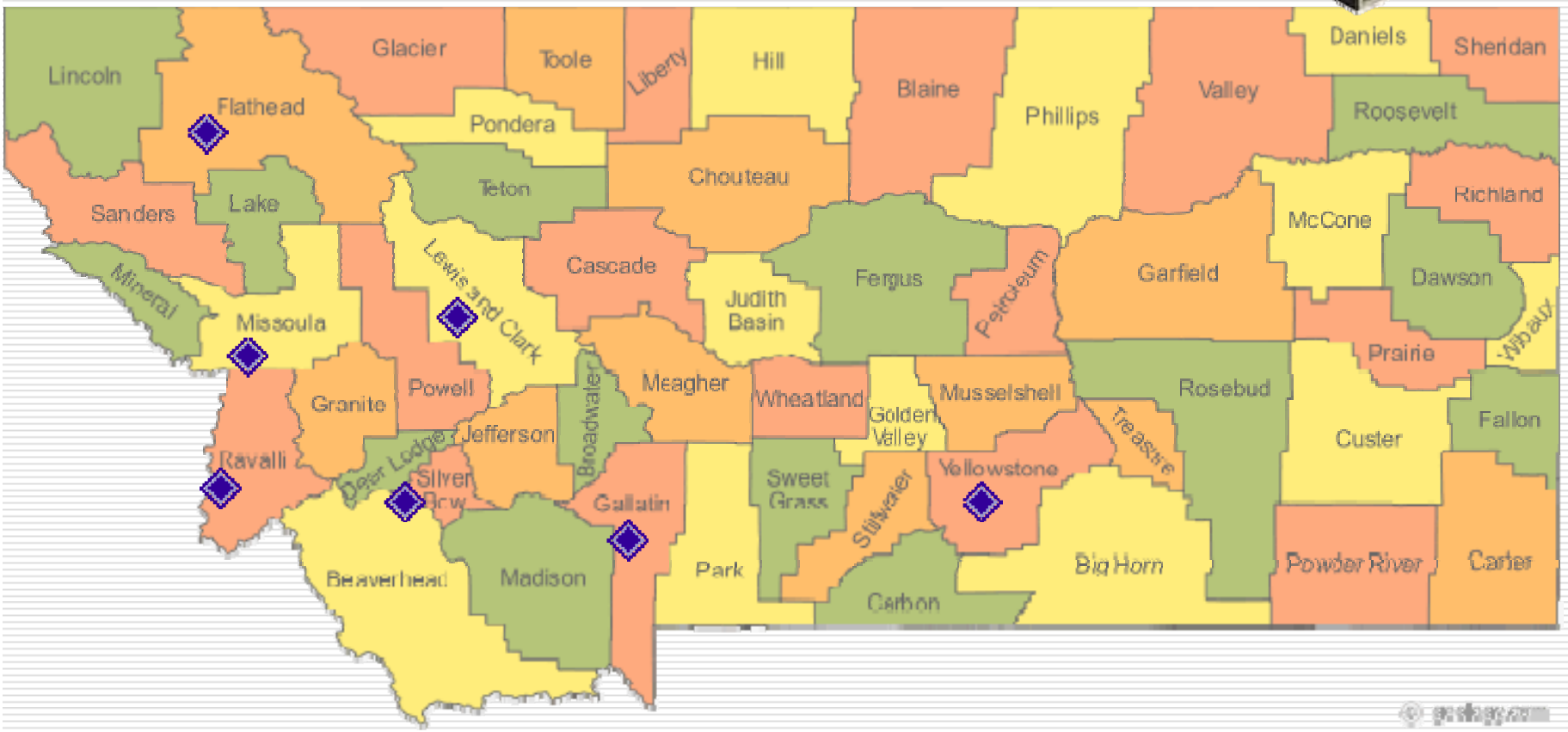
MRM Recycling Program

- Samsung
  - One drop-off location: Miles City
  - 2 U-Hauls (Helena & Missoula)

- MRM Recycling Program
  - Allied Waste in Missoula
  - 1 U-Haul in Helena

SONY Free Recycling

- Partnership with Vann's =
- Small Electronics Only
- No TVs; dropped off elsewhere for $$



How accessible is electronics recycling?

Review:

- Electronics Recycler
  - 2 locations
- Annual Events
  - Community partners/support is essential
  - DEQ will continue
  - Recyclers don't like them
- Retail Programs
  - Located in bigger communities
  - Some free
  - Some charge
- Manufacturer Programs
  - Online & Mail-in
  - Sometimes free
  - Sometimes charges apply
  - Some are in retail stores
  - Some are at a recycling center
  - Often limited or size restrictions
  - No advertising or education
  - Limited signage in stores
  - Often employee education is lacking

The public suggested:

- Recycling should be FREE, or
- Consumers / Manufacturers should SHARE recycling costs
- Convenient
  - Landfill, Transfer Stations
  - Recycling Centers
  - Retailers
- No Exporting

From the 2006 Surveys

Convenient? Accessible?

Comments Received:

"This is confusing – just tell me where to take it."

"Why can't I just drop it off somewhere? I don't have Internet."

"Why can't this be simple? I recycled my cell phone for free and it was easy."

"Will my computer go overseas? I don't want some kid recycling this, especially if I'm paying this much."

"Well, they sure make it difficult, don't they?"

The result of so many diverse programs is a hodge-podge of recycling options, sometimes free, often not.

There are a confusing number of websites and programs to understand and participate in.

A member of the public:

- Must be motivated!
- Must be internet savvy
- Must know the brand (when calling me, most don't recall the brand name of their items)

Often must be willing to:

- Travel to a drop-off location,
  - Pay a recycling fee (Sometimes),
- Package for shipping,
  - Pay for shipping (Sometimes)
- Hold items until annual events.

Motivated recyclers are discouraged

Department of Environmental Quality

Staples Check Presentation, Butte Schools, 2006

Accomplishments

- First Rocky Mountain state to partner EPA's Plug-in to E-Cycling program.
- First state in our region to engage manufacturers.
- Started as a pilot project; quickly grew to include more communities; much larger program.
- Majority of communities participating have continued with annual events; some looking at permanent programs.
- Advocate for rural access to any federal recycling legislation
- Survey work quoted by EPA regarding public wish for no exporting.

Measuring Electronics Recycling

- Don't know actual volume recycled
  - No required reporting
  - In-state recyclers
  - Out-of-state recyclers
  - Manufacturers
  - Retail Stores
- EPA estimates only 10-15% of electronics are recycled each year
- Federal 'study' legislation introduced
  - Meanwhile 20 states have enacted their own e-scrap recycling laws

Thank You

recycle.mt.gov

Sandra Boggs

Recycling and Marketing Development Specialist
Montana Department of Environmental Quality

406-841-5217

sboggs@mt.gov

Appendix E

Nowakowski, Sonja

From: Holland, Steve [sholland@coe.montana.edu]
Sent: Tuesday, March 16, 2010 10:56 PM
To: Nowakowski, Sonja
Subject: RE: EQC Follow-up

Sonja,

I was out of town all of last week… sorry for the delay responding.

I have serious concerns about MMEC doing anything in the regulatory arena. It would erode our ability to provide unbiased technical assistance, which is what we are chartered to do.

We are currently working with DEQ on several waste reduction fronts… especially energy. We readily work with them on educational and other non-regulatory projects.

Another concern, if I recall correctly, was that the bill required us to dedicate a percentage of the effort toward this effort. That could reduce the state match we have available that we need for Federal funds. The result would be a reduction in total funds we have and a reduction in the services we were chartered to provide.

I'd be happy to talk more about how we can work directly with DEQ and other state agencies. Please let me know if I can be of assistance.

Steve
Montana Manufacturing Extension Center

From: Nowakowski, Sonja [mailto:snowakowski@mt.gov]
Sent: Monday, March 08, 2010 12:42 PM
To: Holland, Steve
Subject: EQC Follow-up

Director Holland,

My name is Sonja Nowakowski, and I staff the Environmental Quality Council (EQC). During the EQC's 2007-08 Climate Change study, the EQC brought forward draft legislation (House Bill No. 22) to provide additional funding to the Montana Manufacturing Extension Center and require a portion of that funding be used in collaboration with the DEQ to promote recycling. As the EQC worked on the legislation, you raised concerns about working with a regulatory agency such as DEQ and measuring results based on the bill.

This interim, the EQC is working on a study dedicated to recycling, as required by Senate Joint Resolution 28. At the EQC's March 4-5 meeting, Representative Dickenson asked that the EQC again contemplate asking the Montana Manufacturing Extension Center to work with the DEQ to promote recycling efforts. Representative Dickenson asked if you would have the same concerns as you did about HB 22 last interim. She asked that I visit with you about the proposal and report back to the EQC.

When you have an opportunity, could you let me know if you continue to have concerns about a potential proposal that would be similar to HB 22 (as contemplated by the 2009 Legislature). Feel free to call me any time, if you have additional questions about the EQC's recycling study.

I look forward to hearing back from you.

Thanks,
Sonja Nowakowski

Sonja Nowakowski

Research Analyst
Montana Legislative Services Division
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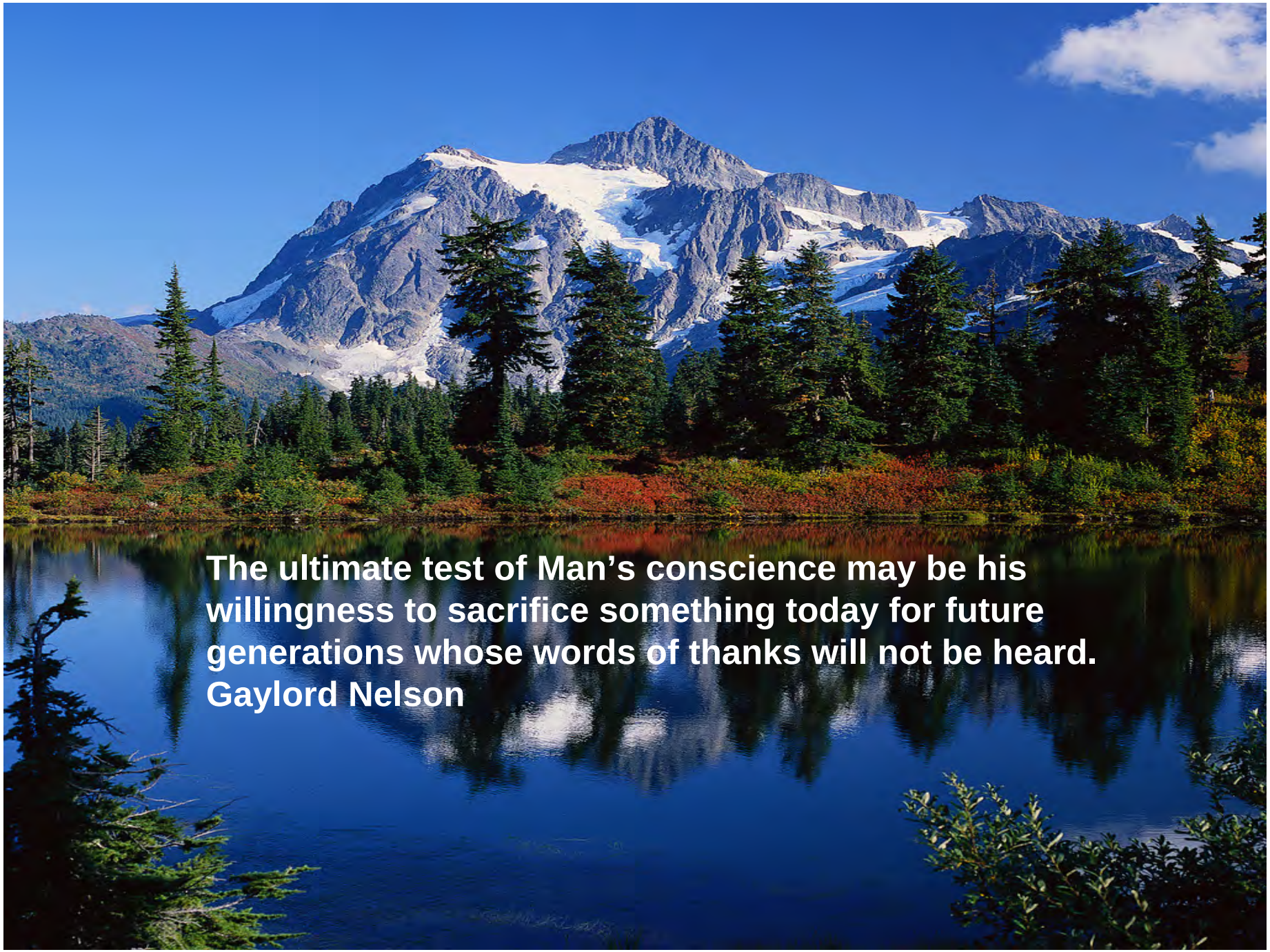
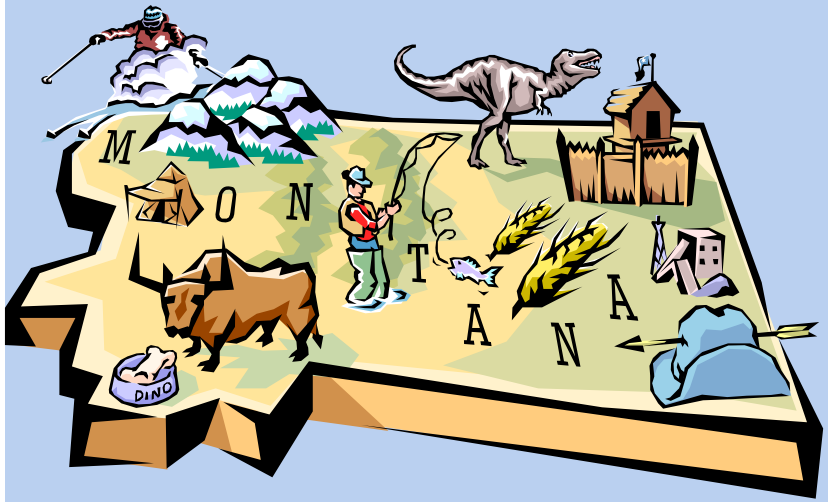

The ultimate test of Man's conscience may be his willingness to sacrifice something today for future generations whose words of thanks will not be heard.
Gaylord Nelson


Montana
Rural Recycling
www.bigskyfishing.com

Introduction

Across the country, local and state governments are faced with the challenge of meeting recycling goals, reducing solid waste tonnage and minimizing costs.

Adding to this challenge is implementing recycling in rural areas. Solving rural recycling issues is not an easy solution and is only a small part of a larger problem that local and state governments are faced with regarding recycling as a whole.



Montana
Is
A typical "rural" state, by definition

Rural Areas are designated as having population densities less than 999 persons per square mile and greater than 1 person per square mile.

Montana is the fourth largest state averaging 147,000 square miles with a population of 967,440 people. We have 56 counties and 22 of those have less then 5,000 people. We have an average of 6.2 people per square mile.

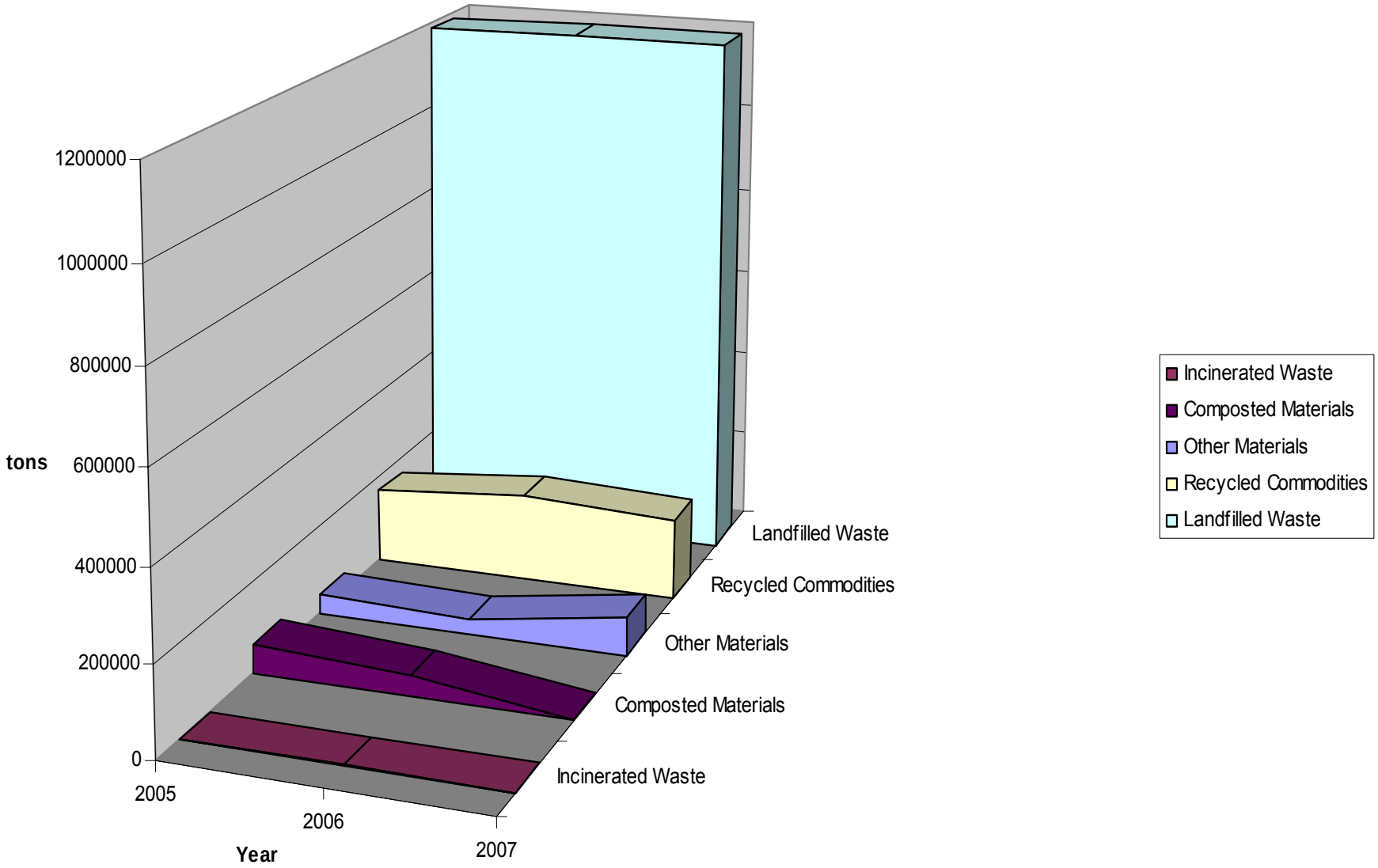
Hence the old saying we have more cattle than people!

Rural areas have solid waste management problems just as urban areas do.

Rural communities are striving alongside their urban counter parts to meet recycling and reduction goals.

Montana has a current waste reduction goal of 19% by 2011

Trends in Waste Generation, Recovery, and Disposal



These recycling and reduction goals are important because many communities are trying to offset the cost of climbing solid waste fees and preserving valuable landfill space.

Landfill expansion is expensive!
The average cell expansion for a landfill cost around 2 million dollars, and many of our rural communities will have huge burdens trying to meet these costs.

Recycling can be a solution

View recycling costs as part of the entire municipal solid waste (MSW) management strategy.

For example, a recycling program should be considered a viable method for **reducing overall disposal costs**

Disposal Costs

Example:

Landfill cost to dispose one ton garbage

Average tipping fee $27.00

Landfill airspace per ton $7/$10 dollars

Average $37.00 to dispose

In 2007, Montanans generated

1,455,595 tons

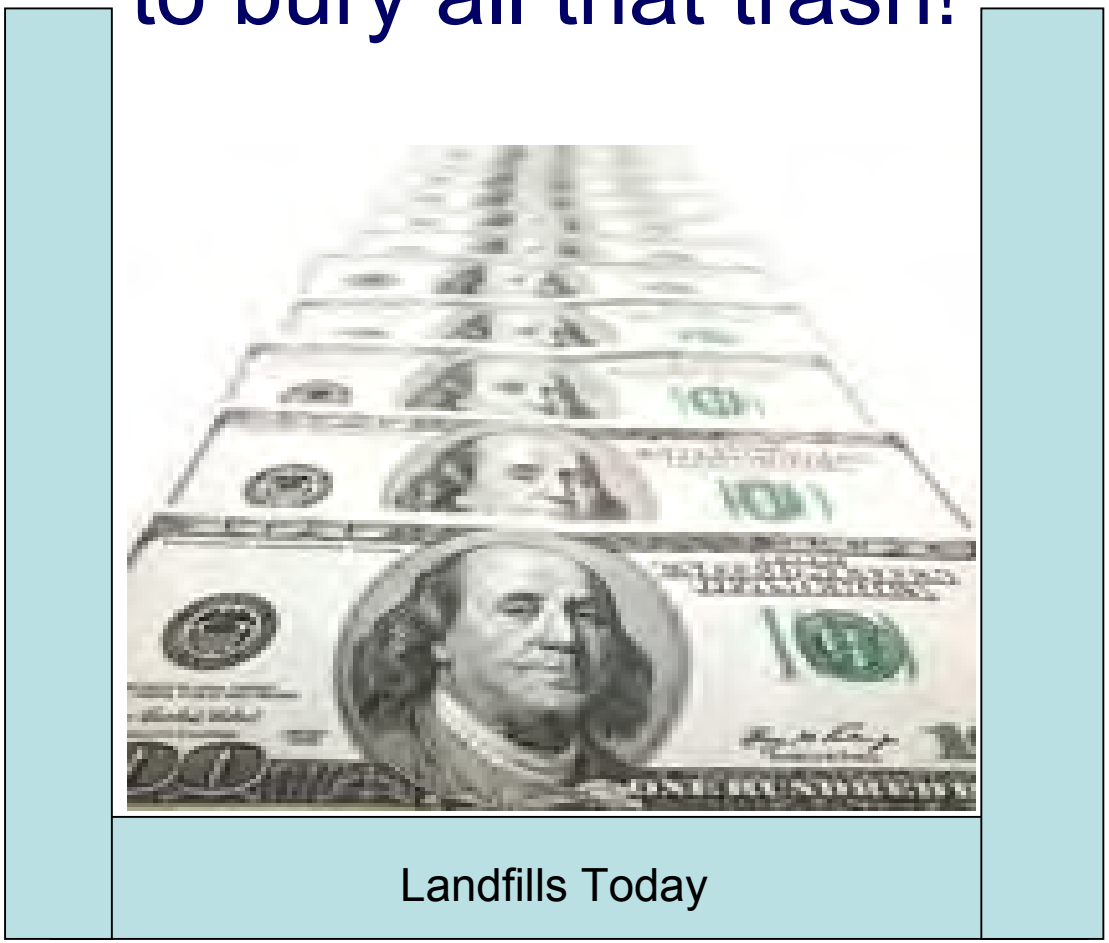
of trash

Landfills Today

At $7/ton it cost:

$10,189,165

to bury all that trash!



Landfill space is valued at

$4 - 10/ton

182,064 tons were recycled in 2007

$1,274,448 of landfill space was saved by recycling in 2007 (At $7/ton)

Recycling Means:

- Income Generated from Sales
- Landfill Cost Savings

Rural Landfill Example:

- Licensed as Intermediate (5,000 – 25,000 tons/year)
- Only recycles aluminum cans at Landfill
- Far from Markets
- Landfill space valued at $7/ton

Aluminum Recycling

$600/ton -Today's market prices ($0.30/Lb)

30 tons x $600 = $18,000 from sales of Al cans

\+ 210 Landfill space savings

$18,210 total value of Al Cans to landfill

\- 1,050 Back-haul cost to market (1.4 trucks w/22 ton max.)

$17,160 Net value to Landfill (annually)

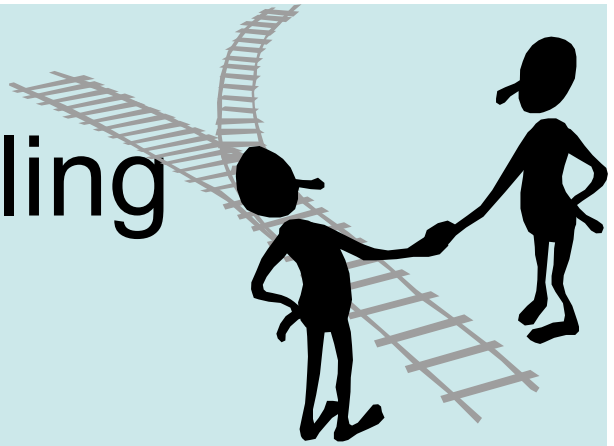

Rural Landfill Example:
Cardboard Recycling
$ 60/ton -Today's market prices ($0.03/Lb)
120 tons x $60 = $7,200 from sales
+ $840 Landfill space savings
$8,040 total value of Cardboard
- $4,500 Back-haul cost to market
(6 trucks w/22 ton max.)
$3,540 Net value to Landfill (annually)

How Markets Affect Recycling Commodities

Reminder

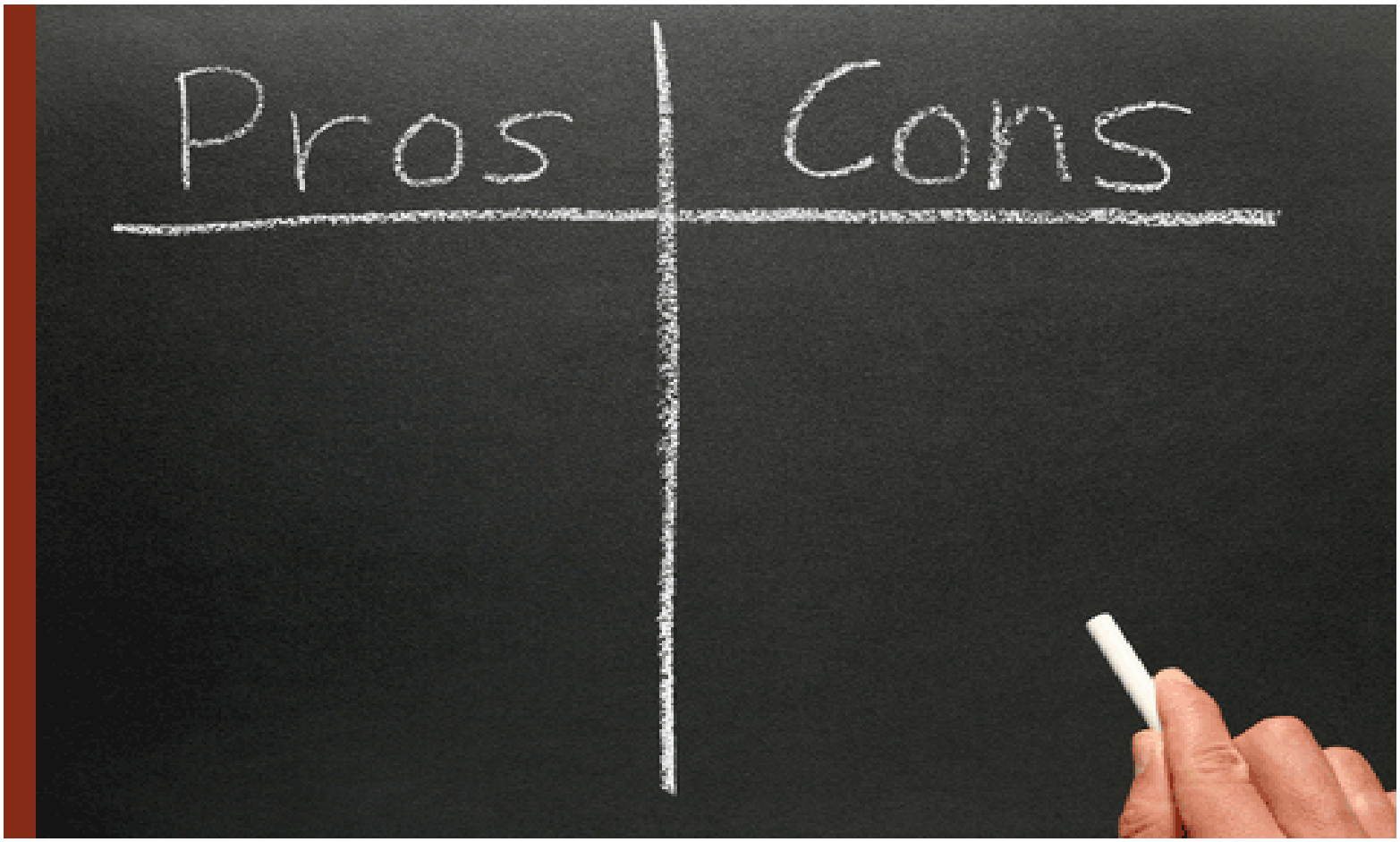
Collecting & Stockpiling recyclables does Not mean the market will be developed

Markets & Recycling



- The scrap market in general, is closely tied to economic conditions because demand for some recyclables tracks closely with markets for new products.
  - Cardboard, for instance, turns into the boxes that package electronics. Rubber goes to shoe soles, Metal is made into auto parts.
- Recycling is a **cyclical industry** that has seen price swings before. The industry follows consumer spending trends.

- One reason prices slid so rapidly this time is that demand from China, the biggest export market for recyclables for the U.S., quickly dried up as the global economy slowed.



Of
Rural Recycling

Rural Recycling Efforts can be Hampered by

- Low population, tax base, limited local government budgets and personnel, low-density housing and limited commercial development.
- Some of these areas are faced with solid waste volumes that fluctuate due to seasonal residents or tourists.
- Accumulating enough processed materials

Strengths

That assist rural communities in developing and operating recycling programs

Rural residents have a strong sense of community

A HISTORY

OF

VOLUNTEERING

Creative & Thrifty approaches to Solid Waste management

Each **County**, **City** and **Town** is unique:
There is no one right way to recycle

There is one commonality each of them must have to make recycling successful

Similar?

Preparing
recyclables
For transport

Transportation in Montana will always be
A major factor

Understanding transportation & requirements for loads is a key to pricing and markets.

Transportation on the average runs $1.80 a mile. Maximizing your load is very important to get full value of the trip.

Example: To ship a full truck (22 tons) of baled paper to Spokane (310 miles) would cost on the average about $550.00 in shipping. The paper would bring $25.00 a ton or $550.00 in revenue. Landfilling this product at $27.00 a ton you pay $594.00.

A regional recycling approach will help to overcome the challenges facing individual rural governments

- Increased volumes of recyclables, will open marketing opportunities and increases revenues.
- Shared costs for equipment, personnel, processing, transportation, marketing, facility capital and operating costs.
- Regional economic stimulus from new collection and processing jobs

Montana's Successes

Montana Department of
ENVIRONMENTAL QUALITY

Small overview of Accomplishments

- 866 tons of electronics
- Over 100 tons of Ag plastic
- 610 lbs of mercury containing materials
- 5,960 lbs from the chemical school clean out program
- Numerous National awards for accomplishments

20 X 10 Montana Leading by Example

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT KIT

Recycle Eureka

Lead by Example mt.gov Sustainable Government

REDUCE BUSINESS JUNK MAIL

APPENDIX E

Montana Licensed Landfills and Locations

Licensed Montana Solid Waste Facilities as of December 28, 2010

License #	City	Facility
373	Anaconda	ANACONDA DEER LODGE CO CLASS III LANDFILL
459	Ashland	ASHLAND MAINTENACE STOCKPILE SITE
396	Augusta	AUGUSTA SOLID WASTE MANAGEMENT DIST
328	Baker	CORAL CREEK LANDFILL
431	Belgrade	THORNTON CLASS III LANDFILL
462	Belgrade	BELGRADE STOCKPILE SITE
477	Belgrade	AMALTHEIA ORGANIC DAIRY, LLC
445	Big Timber	CITY OF BIG TIMBER
113	Billings	CITY OF BILLINGS LANDFILL
452	Billings	TATOOINE ELECTRONICS (RECYCLER)
486	Billings	ALLIED WASTE SERVICES - BILLINGS RECYCLING CENTER
508	Billings	YELLOWSTONE E-WASTE SOLUTIONS INC
356	Bonner	STIMSON WEST RIVERSIDE CLASS III LANDFILL
368	Boulder	JEFFERSON CO CLASS III LANDFILL BOULDER
96	Bozeman	CITY OF BOZEMAN LANDFILL
482	Bozeman	FOUR CORNERS RECYCLING LLC
505	Bozeman	BOZEMAN TREE SERVICE
338	Broadus	POWDER RIVER COUNTY LANDFILL
330	Butte	BUTTE SILVER BOW ROCKER LANDFILL
358	Butte	STERICYCLE
184	Chester	TOWN OF CHESTER LANDFILL
323	Choteau	CHOTEAU CLASS III LANDFILL
496	Choteau	REIDING COMPOST
460	Clearwater	CLEARWATER MAINTENANCE FACILITY
381	Clinton	CLARK FORK COMPOST & RECLAMATION
470	Clyde Park	JOE LAUDON
334	Columbia Falls	FH STOLTZE LAND & LUMBER CO
366	Columbia Falls	PLUM CREEK COLUMBIA FALLS EAST
367	Columbia Falls	PLUM CREEK COLUMBIA FALLS NORTH
461	Columbus	COLUMBUS MAINTENANCE FACILITY

License #	City	Facility
398	Columbus	STILLWATER COUNTY TRANSFER STATION
507	Columbus	TOWN OF COLUMBUS SMALL COMPOST OPERATION
325	Conrad	CONRAD ROLL OFF SITE
314	Conrad	NORTHERN MT JOINT REFUSE DISP DIST
378	Culbertson	TOWN OF CULBERTSON CLASS III LANDFILL
324	Cut Bank	CUT BANK ROLL OFF SITE
22	Deer Lodge	DEER LODGE DISPOSAL DISTRICT
306	Dillon	DILLON LANDFILL
353	Drummond	LOWER FLINT CREEK VALLEY SOLID WASTE SITE
497	Drummond	GRANITE COUNTY SOLID WASTE DISTRICT CARCASS COMPO
383	Dutton	TETON CO REF DISP DIST #1 DUTTON
369	Ekalaka	TOWN OF EKALAKA CLASS III LANDFILL
379	Ennis	MADISON CO CLASS III LANDFILL ENNIS
354	Eureka	TOWN OF EUREKA LANDFILL
225	Floweree	HIGH PLAINS SANITARY LANDFILL SITE 1
182	Forsyth	CITY OF FORSYTH TRANSFER STATION
372	Forsyth	ROSEBUD COUNTY CLASS II LANDFILL
294	Fortine	PLUM CREEK FORTINE CLASS IIIM LANDFILL
295	Glasgow	VALLEY COUNTY REFUSE DIST #1 CLASS II LANDFILL
4	Glendive	CITY OF GLENDIVE SANITARY LANDFILL
414	Great Falls	SHUMAKER CLASS IV LANDFILL
439	Great Falls	RANCH LANDFILL
454	Great Falls	UNITED MATERIALS-SMALL COMPOST OPERATION
466	Great Falls	BOWMANS STOCKPILE SITE
345	Great Falls	MONTANA SAND & GRAVEL
387	Great Falls	MISSOURI RIVER GRAVEL PLANT
404	Great Falls	SOIL REMEDIATION SERVICES
475	Great Falls	GREAT FALLS YARD WASTE RECYCLING FACILITY
484	Great Falls	CITY RECYCLING CENTER
495	Great Falls	MONTANA AIR NATIONAL GUARD
348	Hardin	CITY OF HARDIN CLASS II LANDFILL
389	Havre	UNIFIED DISPOSAL DIST LANDFILL

License #	City	Facility
392	Havre	CITY OF HAVRE BURN SITE
471	Havre	MDT HAVRE
490	Havre	UNIFIED DISPOSAL DISTRICT - NEW CLASS II
360	Helena	LEWIS AND CLARK COUNTY SOLID WASTE MANAGEMENT FA
320	Helena	CITY OF HELENA SOLID WASTE TRANSFER STATION
413	Jordan	JORDAN CLASS IV LANDFILL & BURN SITE
18	Kalispell	FLATHEAD COUNTY SOLID WASTE DISTRICT
438	Kalispell	WOOD WASTE DISPOSAL
451	Kalispell	CITY OF KALISPELL-SMALL COMPOST OPERATION
185	Kalispell	RASMUSSEN TIRE SITE
331	Kalispell	MONTANA LOG HOMES
401	Kevin	NORTH TOOLE COUNTY LANDFARM
394	Laurel	TIRES FOR RECLAMATION
382	Laurel	MONTANA RAIL LINK INC LAUREL
418	Lewistown	FERGUS COUNTY REGIONAL TRANSFER STATION
500	Lewistown	CENTURY COMPANIES, INC
08	Libby	CRYSTAL LAKE CLASS III LANDFILL
99	Libby	LIBBY CLASS II LANDFILL
361	Libby	LIBBY CLASS III LANDFILL
458	Lincoln	ALICE CREEK STOCKPILE SITE
397	Lincoln	LINCOLN COUNTY SOLID WASTE DISTRICT
13	Livingston	PARK CO SOLID WASTE DIST
195	Livingston	PARK COUNTY TRANSFER STATION
426	Livingston	CITY OF LIVINGSTON SMALL COMPOST OPERATION
476	Livingston	CITY OF LIVINGSTON TRANSFER STATION
483	Livingston	COUNTERPOINT INC
493	Livingston	CITY OF LIVINGSTON SMALL COMPOST SITE
501	Lodge Grass	YELLOW MULE A-1 LANDFARM
410	Lonepine	ENVIRO-TIRE INC
349	Malta	CITY OF MALTA LANDFILL
409	Manhattan	TOWN OF MANHATTAN CLASS III LANDFILL
432	Manhattan	EARTH SYSTEMS ORGANIC COMPOST

License #	City	Facility
158	Manhattan	GALLATIN COUNTY LANDFILL - LOGAN
227	Miles City	CUSTER COUNTY LANDFILL 1
116	Missoula	ALLIED WASTE SYSTEMS OF MONTANA-MISSOULA
421	Missoula	MONTANA RESOURCE & RECOVERY CENTER
463	Missoula	DE SMET MAINTENANCE STOCKPILE
346	Missoula	EKO COMPOST INC
359	Missoula	SMURFIT-STONE CONTAINER ENTERPRISES INC
487	Missoula	ALLIED WASTE SERVICES - MISSOULA RECYCLING CENTER
488	Missoula	PALMER ELECTRIC TECHNOLOGY ENERGY SERVICES INC
506	Missoula	AXMEN RECYCLING
510	Missoula	DM INTERNATIONAL
296	Montana City	VALLEYVIEW LANDFILL
342	Olney	GLACIER GOLD LLC
393	Pablo	PLUM CREEK PABLO CLASS III LANDFILL
415	Philipsburg	PHILIPSBURG CLASS III BURN SITE
407	Plains	PLAINS CLASS III BURN SITE
17	Plentywood	SHERIDAN COUNTY LANDFILL
36	Polson	LAKE CO LANDFILL
437	Polson	LAKE COUNTY TRANSFER STATION
329	Polson	LAKE CO CLASS III LANDFILL
390	Polson	TIRE DEPOT RESOURCE RECOVERY FACILITY CLASS III LANDFI
374	Polson	PLANET MANAGEMENT SYSTEMS INC
384	Power	TETON CO REFUSE DISP DIST #1 POWER
509	Pray	AJM INCORPORATED ONE-TIME LANDFARM
499	Red Lodge	RED LODGE ALES BREWING COMPANY
327	Roundup	MUSSELSHELL CO REFUSE DIST BURN SITE
406	Sand Coulee	SHUMAKER LANDFARM
299	Scobey	DANIELS CO SOLID WASTE LANDFILL
412	Seeley Lake	SEELEY LAKE CLASS III LANDFILL & BURN SITE
371	Seeley Lake	PYRAMID MOUNTAIN LUMBER INC LANDFILL
83	Shelby	CITY OF SHELBY LANDFILL
357	Sidney	SIDNEY SUGARS INCORPORATED

License #	City	Facility
376	Sidney	RICHLAND COUNTY CLASS II LANDFILL
480	Sunburst	SUNBURST RESTORATION PROJECT LANDFARM
316	Terry	TERRY CLASS III BURN SITE & LANDFILL
467	Thompson Falls	THOMPSON FALLS MAINTENANCE SHOP
347	Thompson Falls	SANDERS CO TRANSFER STATION
351	Townsend	BROADWATER TRANSFER STATION & CLASS III LANDFILL
388	Trout Creek	TROUT CREEK CLASS III LANDFILL
337	Troy	TROY CLASS III SOLID WASTE LANDFILL
380	Twin Bridges	MADISON CO CLASS III LANDFILL TWIN BRIDGES
455	Victor	VICTOR STOCKPILE SITE
305	Victor	VICTOR TRANSFER STATION
436	West Yellowstone	W YELLOWSTONE COMPOSTING FACILITY
312	White Sulphur Springs	MEAGHER CO SOLID WASTE TRANSFER STATION
315	White Sulphur Springs	MEAGHER COUNTY SW TRANSFER STATION
485	Whitefish	NORTH VALLEY REFUSE & RECYCLING
370	Whitehall	JEFFERSON CO CLASS III LANDFILL WHITEHALL FACILITY
364	Wibaux	WIBAUX COUNTY CLASS III LANDFILL
3	Wolf Point	WOLF POINT CITY LANDFILL
453	Wolf Point	CITY OF WOLF POINT CLASS II LANDFILL

APPENDIX F: MONTANA COMMUNITY RECYCLING RESOURCES

Montana citizens continue to exhibit interest in recycling more and more items through local recycling programs. Some communities now have grassroots organizations of committed individuals working directly to increase recycling services. These citizen groups may offer education, special collection events, volunteer to staff recycling drop-off programs, or apply for grants in order to win or purchase recycling equipment for their community programs. These groups provide valuable services and in some cases, may provide the only opportunities for recycling in that area. In the past, this publication provided information on recycling resources in each community when available. This edition, in response to wider acceptance of electronic resources, does not attempt to list all organizations and contacts present in Montana at the time of publication. The Department of Environmental Quality places municipal recycling guides on the Internet, and updates the pages frequently to contain current information.

A small list of state resources and established recycling operations are listed here, but for community-specific information, readers are directed to enter their zip code on the www.Earth911.org website. Earth911.org is a national database that provides recycling information based upon zip codes. The database contains information on basic recycling services, and allows for a local coordinator to update the database with information specific to each community. The DEQ is a statewide coordinator and encourages the development of local coordinators responsible for providing the Earth911.org database with updates and accurate information. Contact local waste management facilities for resources and information as well.

Statewide Resources

Earth911.org: Enter zip code for local recycling information; www.Earth911.org.

Montana DEQ: Find recycling guides for Montana municipalities; www.recycle.mt.gov;

Recycle Montana: Statewide nonprofit supporting recycling; P.O. Box 1360, Helena, 461-9106, www.recyclemontana.org.

The S.A.V.E. Foundation: Statewide nonprofit supporting recycling; P.O. Box 1481, Helena, www.savemobile.org

Partial list of Montana Recyclers:

A & S Metals, 2100 Meadowlark Lane, Butte, 406-494-1661.

Pacific Steel & Recycling, Headquarters, 1624 12th Avenue North, Great Falls, MT 800-332-9930; Located throughout the state: Billings, Butte, Bozeman, Glasgow, Great Falls, Havre, Helena, Kalispell, Lewistown, Missoula, Miles City and Sidney, MT.

Republic Services (formerly Allied Waste Services), Headquarters, 3207 West Broadway, Missoula, 549-2718; With locations in Bozeman and Billings, MT.

Steel, Etc, P.O. Box 1279, Great Falls, 406-761-4848

Valley Recycling, 1410 Hwy 2 West, Kalispell, 406-257-1739

Yellowstone E-Waste Solutions, 15 N. 15th St, Billings; 406-861-4920; yellowstoneewaste.com

APPENDIX G: MONTANA LICENSED COMPOSTING FACILITIES AND LOCATIONS

Local Government Compost Facilities In Montana - 2010

COUNTY	CITY	FACILITY	MATERIALS ACCEPTED
Broadwater	Townsend	Broadwater Transfer Station & Class III	yard waste
Cascade	Great falls	Great Falls Yard Waste Recycling Facility	yard waste and wood chips
Custer	Miles city	Miles City Area Solid Waste Disposal District	yard waste
Daniels	Scobey	Daniels Co Landfill	yard waste
Dawson	Glendive	Glendive Landfill	yard waste
Deer lodge	Anaconda	Anaconda-Deer Lodge Co Class III Landfill	yard waste
Fallon	Baker	Coral Creek Landfill	yard waste
Flathead	Kalispell	Flathead Co Solid Waste	yard waste
Granite	Philipsburg	Lower Flint Creek Valley Solid Waste Site	yard and barnyard waste
Granite	Philipsburg	Philipsburg Class III Burn Site	yard waste
Lewis & Clark	Lincoln	Lincoln Ref Dist Class III Burn & Compost	yard waste
Lewis & Clark ****	Helena	L & C Co. Class II Landfill (Big Butte Bio-Logic Compost)	bio-solids, sawdust and yard waste
Lincoln	Libby	Libby Class II Landfill	yard waste
Park	Livingston	City of Livingston Yard Waste	yard waste
Phillips	Malta	City of Malta Class II Landfill	yard waste
Prairie	Terry	Terry class III Burn Site & Compost Site	yard waste
Roosevelt	Culbertson	Town of Culbertson Class III Landfill	yard waste
Roosevelt	Wolf Point	Wolf Point City Landfill	yard waste

Silver Bow ****	Butte	Butte-Silver Bow Government (Big-Butte Bio-Logic Compost)	yard waste, bio-solids, sawdust
Wibaux	Wibaux	Wibaux County Class III Landfill	yard waste
Yellowstone	Billings	City of Billings Landfill	yard waste

Private Compost Programs

****Bio-logic Compost, Produced by Big Butte Compost on-site at local government facilities, as identified.
105 N. Broadway Suite A, Butte, MT 59701, 782-0190

Clark Fork Compost and Reclamation, Inc., 11357 Rustic Rd, Clinton MT, 59825, 207-8403

Earth Systems Compost, 550 Cedar Hills Rd, Whitehall, 582-0660

EKO-Kompost, Inc., 3700 Compost Road, Missoula, 59801, 721-1423

Glacier Gold LLC, 255 Good Creek Road, Olney, 59927, 881-3033

West Yellowstone West Yellowstone, 59758, 582-3192

APPENDIX H: ADDITIONAL INFORMATION RESOURCES

General

STATE CONTACTS:

Alternative Energy Resource Organization
432 North Last Chance Gulch, Helena, MT 59601, 406-443-7272

Headwaters Cooperative Recycling, PO Box 1020, Boulder, MT 59632
406-461-5601

Montana Audubon Council, P.O. Box 595, Helena, MT 59624-0595
406-443-3949, http://www.mtaudubon.org/

Montana Environmental Organizations

University of Montana provides a list of non-profit environmental groups at:
http://www2.umt.edu/asum/envirolaw/mtenvirolinks.htm

Montana State University
Montana Pollution Prevention Program
This program is part of MSU extension services and provides information and assistance to small businesses and citizens throughout the state. 406-994-3451 / (888) MSU-MTP2; http://www.mtp2.org

Peaks to Prairies
A pollution prevention network in EPA Region 8l, which includes Montana.
http://www.peakstoprairies.org/

National Center for Appropriate Technology
Serves economically disadvantaged people by providing information and access to appropriate technologies that can help improve their lives. NCAT projects have ranged from low-tech to high-tech, addressing complex issues of housing, economics, and environmental quality. Weatherizing houses, training farmers, monitoring energy use, demonstrating renewable energy technology, testing new products and providing information on building construction are just a few of the many ways that NCAT has contributed to fostering healthy communities and a better quality of life for everyone. 3040 Continental Drive, Butte, MT 59701, 406-494-4572, 1-800-ASK-NCAT; http://www.ncat.org

Northern Plains Resource Council, 2401 Montana Ave.,Suite 200,
Billings, MT 59101, 406-248-1154; http://www.northernplains.org/

Rocky Mountain Recycling, 1909 Wyoming St., Missoula, MT 59801;
406-273-2013

ADDITIONAL RESOURCES:

Earthday Network
An international collection of resources for Earth Day activities.
http://www.earthday.net

Envirolink
A large collection of online resources.
http://www.envirolink.org

Environmental Defense Fund
Environmental Defense is a leading national nonprofit organization representing more than 400,000 members. Since 1967, we have linked science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems.
http://www.environmentaldefense.org/

Environmental Protection Agency
The Wastewise Program is a free, voluntary, EPA program through which organizations eliminate costly municipal solid waste and select industrial wastes, benefiting their bottom line and the environment. WasteWise is a flexible program that allows partners to design their own waste reduction programs tailored to their needs. www.epa.gov/wastewise

Global Recycling Network
Global Recycling Network is an electronic information exchange that specializes in the trade of recyclables reclaimed in Municipal Solid Waste (MSW) streams, as well as the marketing of eco-friendly products.
http://www.grn.com/

Midwest Recycling Association
Midwest Recycling Association (MRA) coordinates marketing, consulting and educational services, 228 Keller Avenue North, Amergy, WI 54001.
715-268-4374 http://www.midwestrecycling.com/

National Recycling Coalition
A national recycling organization that provides resources and promotes recycling issues across the country.
http://www.nrc-recycle.org

Natural Resources Defense Council
NRDC is the nation's most effective environmental action organization. We use law, science and the support of more than 1 million members and online activists to protect the planet's wildlife and wild places and to ensure a safe and healthy environment for all living things. http://www.nrdc.org/

Washington State Recycling Association
WSRA is a trade association that provides leadership in recycling education and advancements throughout the Northwest region. The WSRA serves a diverse membership of over 700 people with a unified focus on expanding commercial and residential recycling rates, promoting new recycling markets, and increasing the demand for and use of recycled materials in all aspects of modern day society.
http://www.wsra.net/

Midwest Assistance Program (MAP), P.O. Box 81, New Prague, MN 56071, (800) 822-2981.
Includes: Iowa, Minnesota, Missouri, Montana, Nebraska, The Dakotas, and Wyoming. Distributes Solid Waste Management Training Modules for Local Government. The four modules cover recycling, yard waste, composting, landfill management, waste reduction and water issues.

Western States Contracting Alliance (WSCA)
The primary purpose of WSCA is to establish the means by which participating states may join together in cooperative multi-State contracting in order to achieve cost-effective and efficient acquisition of quality products and services. Membership consists of the principal procurement official that heads the state central procurement organization, or designee for that state, from the states of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Minnesota, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington and Wyoming. All governmental entities within WSCA states are welcome to use the approved agreements as well as authorized governmental entities in non-WSCA states. Everyone benefits from cumulative volume discounts. Department of General Administration, Office of State Procurement 216 General Administration Building, AX-22 / Olympia, WA 98504-0622, 206-753-0900. Montana Contact: Jeanne Wolf, Department of Administration 406-444-7210
http://www.purchasing.utah.gov/wsca/wscawelcome.html

Asset Waste Management and Recycling, Inc
Asset Waste Management and Recycling is a worldwide recycling company, which recycles computer, electronic parts and components, phones of all kinds including cell phones, paper and more.800-557-0726
http://www.assetwmr.com/

Environmental Protection Agency, Office of Solid Wastes (OSW)
Ben Bents, 303-312-6435, Denver, CO http://www.epa.gov/epaoswer/osw/
Stephanie Wallace, Solid Wastes and Brown Fields Coordinator
406-457-5018, Helena, MT Wallace.Stephanie@epa.gov

Solid & Hazardous Waste Education Center (SHWEC)
A cooperative extension of the University of Wisconsin. http://www.uwex.edu/shwec

LOCAL GOVERNMENT CONTACTS:

Montana Association of Counties
Gordon Morris
2715 Skyway Dr
Helena, MT 59601
406-442-5209
http://www.discoveringmontana.com/maco

Montana League of Cities and Towns
Alec Hansen
League of Cities and Towns
208 North Montana Avenue
Helena, MT 59601
406-442-8768
http://www.mlct.org/

MAGAZINES

BioCycle: Journal of Waste Recycling
A magazine on composting and organics recycling.
http://www.jgpress.com/

MSW Management: The Journal for Municipal Solid Waste Professionals
A magazine written for professionals working in the solid waste management industry. Our readers are those who plan, site, build, engineer, maintain, monitor and operate private or public-sector solid waste landfills, solid waste and recycling collection and disposal systems, composting operations, yard waste processing operations, incinerators, and all other operations and facilities that are used to manage our solid wastes.
http://www.forester.net/mw_about.html

Recycling Today
Focused on the business of recycling, *Recycling Today* magazine provides the most comprehensive market coverage for scrap commodity markets, legislative and regulatory issues, as well as business and technical information necessary for effective management in complex markets. Our editorial coverage is combined with circulation reaching scrap dealers and processors, material recovery facilities (MRFs) and recycling centers, automobile recyclers and demolition contractors.
http://www.recyclingtoday.com/

Resource Recovery Report
Newsletter that covers news related to waste management, recycling, composting, and resource recovery.
No website

Resource Recycling: North America's Recycling Journal
Resource Recycling has published industry periodicals for more than 22 years. The company's namesake and flagship product, *Resource Recycling*, is the favored magazine of the recycling and composting industry. Two monthly newsletters, *E-Scrap News* and *Plastics Recycling Update* , offer authoritative, insightful market-oriented information, sent first-class for timely analyses. Currently, the company also offers three comprehensive resources of recycling information, the *Scrap Plastics Markets Directory* , *Directory of the North American Electronics Recycling Industry* and the *Directory of Key Recycling Contacts*. The company also hosts an annual electronics recycling conference, *E-Scrap, North American Electronics Recycling Conference*
P.O. Box 42270
Portland, OR 97242-0270
503- 233-1305
503-233-1356 (fax)
www.resource-recycling.com

Waste Age
This magazine serves private contracting firms, governmental entities, consulting engineers, industrial plants, retailing firms, and hospitals, as well as equipment dealers, distributors, manufacturers and other allied to the field. Every issue is devoted to bringing industry professionals the most comprehensive and up-to-date news and information.
http://www.wasteage.com/