
# City of Livingston & Park County Montana
# Solid Waste Management Plan

**September 2006**

**Prepared By:**

**Zia Engineering & Environmental Consultants, LLC**

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# Montana
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## BACKGROUND

In April 2005, the solid waste incinerator operated by Park county was removed from service due to non-compliance with federal air emission standards. Considering the age of the incinerator, bringing it into compliance was neither economically nor operationally feasible. On November 2, 2005, the City of Livingston, Town of Clyde Park and Park County entered into a temporary inter-local agreement allowing the County to handle and dispose solid waste collected by the City.

The County constructed and operated a transfer station to handle solid waste collected by the city at curb side and at green box locations by the county. For disposal of solid waste the county entered into a 5–year contract with Environcon, Inc. Under this contract Envirocon is responsible for the transport of compacted (compacted at the Transfer Station by the County) solid waste in specially designed 12-ton capacity rail transport containers (called bottles) to an out-of-county Municipal Solid Waste (MSW) landfill for disposal.

The unlined Class II landfill operated by Park County cannot accept MSW due to a court decree arising from the 1981 **Sundling v. Park County** (Appendix A) case. Thus, the current arrangement of solid waste handling and disposal is viewed by the City and County as a temporary response to a difficult situation created after the shut down of the incinerator.

Earlier in 2006, the inter-local sub-committee prudently decided to undertake a comprehensive review of the area's solid waste management and seek long term reliable solution to its solid waste collection, handling and disposal needs. Zia Engineering & Environmental Consultants, LLC (Zia) was selected to prepare a solid waste management plan for the City of Livingston and Park County. Zia was retained to objectively evaluate options and make recommendations. Professionals from Zia spent considerable time visiting facilities throughout Park County, meeting with elected and appointed officials of Park County and the City of Livingston, attending public meetings and forums to seek feedback from the public at large. After careful and comprehensive review, Zia developed the **"City of Livingston & Park County Montana, Solid Waste Management Plan".**

## OBJECTIVES

The objectives of this plan are:

- Provide a road map for 20-year collection, waste diversion and recycling, handling, transportation and disposal of solid waste in Park County

- Evaluate alternative scenarios for solid waste disposal from an economic, technical, reliability and regulatory compliance stand point
- Evaluate best management practices and make recommendations for improving service, reducing operational complexity and cost of solid waste handling and disposal
- Evaluate the merits and feasibility of joint solid waste management within Park County, City of Livingston and Clyde Park

## SOLID WASTE PLAN GUIDING PRINCIPLES

The 20-year solid waste plan for Park County is formulated on the following guiding principles:

### Coordination

The solid waste management plan can only succeed if there is full and complete cooperation and a spirit of accommodation between the elected bodies of the City of Livingston and Park County.

### Local Control

The plan must be designed to retain control by the governing boards of the two entities regarding setting of policy, capital expenditure and rates for the MSW services. Joint governance of solid waste management should be under the direction of a body that has equitable and fair representation from both the City and County Commissions. Advisory boards, or committees should have equitable and fair representation from residents of the City of Livingston, Town of Clyde Park and the County.

### Efficiency

The plan must efficiently utilize all assets and resources available within the City and the County.

### Reliability

The plan must seek methods and processes that will reliably provide solid waste handling and disposal for the planning horizon of 20 years.

### Flexibility

The plan must select processes, methods and management structure that are flexible and able to comply with changing environmental, demographic, economic and regulatory conditions during the planning period.

### Regulatory Consistency and Stability

Federal and state regulations are always changing and this impacts local government operations relative to solid waste management.

### Fairness in Cost Sharing

The plan must strive to provide equitable cost sharing between all entities within the joint solid waste management structure.

### Support Waste Reduction / Recycling

The plan must provide for adequate incentive for waste reduction and recycling.

### Public Awareness and Education

Public awareness and education will be an integral part of a successful plan.

### Addressing Local Needs is Paramount

The plan must provide an economic and technical baseline, strictly based on local requirements and solid waste generated within Park County. Solid waste from other jurisdictions for possible improvement in economic viability should not be included in formulating plan recommendations.

The solid waste plan presented herein uses the above guiding principles in evaluating various alternatives and in making recommendations.

## SOLID WASTE MANAGEMENT ORGANIZATION STRUCTURE

Based on conservative estimates of population growth in the planning area, it is estimated that at the end of the 20-year planning period approximately 18,000 tons of solid waste will be generated annually in the incorporated and unincorporated areas of Park County.

This volume is considered a modest solid waste generation when compared to other urban and rural areas of the country. Therefore, the capital, operations and maintenance costs of any solid waste facility in Park County will be spread over a relatively small quantity of solid waste. This results in a higher cost per ton of solid waste management as compared to other facilities in Montana.

Due to these facts, the management and administration of solid waste operations in the City of Livingston and Park County should be integrated to maximize the use of available resources and assets, and to optimize on the economies of scale created by combining waste streams within Park County. A fragmented approach to solid waste management by the City and County will further deteriorate the economics of solid waste handling and disposal.

### Creation of a Joint Solid Waste Authority

Integration of solid waste management in Livingston and Park County can best be achieved by creation of a joint solid waste management entity. Montana Department of Environmental Quality (DEQ) staff has pointed out that several joint solid waste management entities in Montana exist with contractual agreements that may serve as models for Park County. The organizational structure of this joint authority must be consistent with Montana Statute and should be created by the unequivocal approval of the Park County Board of County Commissioners, the City Commission of Livingston and Town Council of Clyde Park.

The need for establishing a joint authority is so compelling that the Solid Waste Management Plan limits the evaluation of various scenarios for solid waste handling and disposal to integrated systems, whereby waste streams of the City and County are combined and treated as one. The plan makes the assumption that full cooperation and coordination between the entities will exist for managing solid waste in the area.

## WASTE REDUCTION AND RECYCLING

Once a joint authority is in place a diversion goal and associated time frame for achieving the goals should be established. Establishing such goals expresses a commitment to waste reduction and recycling and provides a common purpose for all sectors of the community. Some examples of the initiatives that can be taken by the joint authority are

- Increase Headwaters Cooperative Recycling Drop-off Centers
- Residential Recyclables Collection Services within the City of Livingston Solid Waste Collection Service Area (the collection service area is recommended in the plan for expansion into areas at the fringes of the municipal limits of Livingston)
- Commercial Glass Recycling- Pulverizing and re-use in various applications
- Relocation and Expansion of City's Composting Operations for wider acceptance within Park County for recycling yard wastes (green waste)
- Construction of a Material Recovery Facility (MRF) for limited processing of recyclables, aggregation and storage for transportation to markets

## SOLID WASTE MANAGEMENT SCENARIOS

The plan evaluates the feasibility of four (4) feasible solid waste management scenarios. Formulation of these scenarios followed the guiding principles discussed above. These scenarios are based on the premise that the City of Livingston,

Clyde Park and Park County will form a joint authority and consolidate operations in order to make the operations more efficient and cost effective in the long term. "Planning level" estimates of cost are provided for each of the selected scenarios. (for comparison purpose only).

**Scenario A – Curbside and Green Box Collection and Incineration of Combined Waste**

Under this scenario solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the greater County area will continue to be collected at green box locations. All City and County solid wastes, except construction and demolition debris wastes, will be transported to a new incineration facility consisting of two (2) - 48 Tons Per Day modular incinerators. Construction and demolition waste will continue to be disposed at the existing Park County landfill.

This scenario is estimated to be the highest capital and operating cost alternative among the four scenarios. Approximately $5.9M initial capital investment will be required and the owning and operating cost over the 20-year planning period will translate to a cost of solid waste disposal cost of about $125/Ton

**Scenario B - Curbside and Green Box Collection and Rail Haul to Out of County Landfill for Disposal**

This scenario replicates the existing transfer and disposal methods being used by Park County since 2005. Under this scenario solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the greater County area will continue to be collected at green box locations. All City and County solid wastes, except construction and demolition debris, will be transported to the existing Transfer Station facility. At the Transfer Station, solid waste will be compacted and loaded into bottles, placed on rail cars and hauled away to Valley View (or some other landfill at about the same distance from Livingston) by a private contractor. Construction and demolition waste will continue to be disposed at the existing Park County landfill.

Since Park County already has most of the infrastructure in place, this scenario requires the least capital investment. The owning and operating cost of this scenario (excluding the capital investment already made by Park County in existing infrastructure) translates to solid waste disposal cost of about $91/Ton.

**Scenario C - Curbside and Green Box Collection and Truck Haul to Out of County Landfill for Disposal**

Under this scenario Solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the greater County area will continue to be collected at green box locations. All City and County solid wastes including commercial wastes, except construction and demolition debris, will be transported to the Transfer Station facility. From the Transfer Station, 22-ton capacity (about 100 CY, 50 ft long) trailers and trucks will carry solid waste to a landfill within 120 miles from Livingston, for disposal. Construction and demolition waste will continue to be disposed at the existing Park County landfill.

This alternative requires approximately $1.2M capital investment in reconfiguration and re-construction of the transfer station and acquisition of two (2) long haul 22-Ton capacity trailer-trucks. The annual ownership and operating cost of this scenario translates to solid waste disposal cost of about $93/Ton.

**Scenario D - Curbside and Green Box Collection and Disposal in a New Park County Landfill**

Under this scenario solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the greater County area will continue to be collected at green box locations. All City and County solid wastes, except construction and demolition debris, will be transported to the modified Transfer Station facility. Under this scenario 22-ton capacity long haul trucks owned (to be acquired) by the County will be used to transport solid waste to a new Park County Landfill preferably located within 20 miles from Livingston. Construction and demolition waste will continue to be disposed at the existing Park County landfill.

This scenario requires initial capital investment of approximately $2.5M and the annual owning and operating cost translates to about $91/Ton for solid waste disposal.

## EXISTING PARK COUNTY LANDFILL

The existing Park County landfill is a Montana DEQ permitted Class II landfill. This permit does allow disposal of MSW in this ideally located landfill. However, use of this landfill for MSW disposal is prohibited under the 1981 court decree (**Sudling v. Park County**) (Appendix A). Therefore, this landfill was not considered as one of the disposal scenarios. If through negotiations and under legal guidance, the court decree can be revisited, this landfill can provide one of the most economical options for solid waste disposal. Use of this landfill may reduce the cost of solid waste disposal to below $50/Ton.

## RISKS

All solid waste management scenarios have some risk. The process of selecting a solid waste management scenario must consider risks associated with the respective scenario. For the solid waste disposal scenarios considered in this Plan, risks were divided in three categories – high, moderate and low. Risks are classified as follows:

- Regulatory Risk – if regulations are subject to frequent and drastic changes it presents a risk in implementing and operating a facility in compliance with the regulations.
- Implementation Risk- Some solid waste scenarios discussed above present implementation risk associated with uncertainty in permitting the facility. For example air emissions standards and ash disposal from a MSW incinerator cannot be determined until a detailed permit application is submitted and approved by DEQ and EPA. Furthermore, operating permit for an incinerator is not granted until initial operation and testing of the facility. Thus, in spite of a major capital investment operation of the incinerator and regulatory burden placed upon the facility remains unknown.
- Operating Risk- Potential of a sudden termination of service, major road or rail road accident, inclement weather etc. present operating risks
- Life Cycle Cost Risk- Due to regulatory and permitting uncertainties, lack of reliable historical cost information and unforeseen operations and maintenance costs add life cycle cost risk to solid waster disposal scenarios

As a quick guide the table on the following page summarizes risks associated with the various scenarios.

### Risk Analysis of Solid Waste Disposal Scenarios

| Risk | Scenario A | Scenario B | Scenario C | Scenario D |
|---|---|---|---|---|
| **Regulatory Risk** | High | Low | Low | Moderate |
| **Implementation Risk** | High | Low | Low | Moderate |
| **Operating Risk** | Moderate | Moderate | High | Low |
| **Life Cycle Cost Risk** | High | Moderate | Moderate | Low |

## RANKING OF SCENARIOS

By allocating weighted scoring of the relevant factors affecting the selection of a solid waste management scenario, the four scenarios were ranked. The ranking matrix is shown in Table 10.2-A below. Note that Scenario D (new Park County landfill) is the top ranking alternative. This top ranking is greatly reinforced if the existing Park County landfill can be opened to MSW.

### Evaluation and Ranking of Alternative Scenarios

| CRITERIA | Scenario A | | Scenario B | | Scenario C | | Scenario D | |
|---|---|---|---|---|---|---|---|---|
| | a | b | a | b | a | b | a | b |
| Capital Outlay (2) | 1 | 2 | 5 | 10 | 3 | 6 | 3 | 6 |
| Cost per Ton (3) | 1 | 3 | 5 | 15 | 5 | 15 | 5 | 15 |
| Reliability (3) | 4 | 12 | 1 | 3 | 4 | 12 | 5 | 15 |
| Regulatory Burden (3) | 3 | 9 | 5 | 15 | 5 | 15 | 3 | 9 |
| Operating Flexibility (2) | 3 | 6 | 2 | 4 | 3 | 6 | 5 | 10 |
| Cost Reduction with Added Waste (1) | 3 | 3 | 1 | 1 | 1 | 1 | 5 | 5 |
| Ease of Implementation (2) | 2 | 4 | 5 | 10 | 4 | 8 | 3 | 6 |
| **Total Score** | **41** | | **58** | | **63** | | **66** | |
| **Ranking** | **4** | | **3** | | **2** | | **1** | |

NOTES:
1. Numbers in parenthesis are weights given to the respective criteria
2. Scoring of each scenario is based on a score of 1-5; 1 is least desirable and 5 is most desirable
3. Column “a” – Score; column “b” – Weighted Score

## Recommendations

The following recommendations are offered to the Board of County Commissioners of Park County and the City Council of the City of Livingston:

1. Complete Current Five – Year Envirocon Contract and continue rail haul to Valley View landfill under the current contract.
2. City of Livingston and Park County are well advised to quickly proceed in the formation of a joint authority.
3. The Authority should contract with the City of Livingston to provide curbside collection of solid waste in the county areas adjoining the municipal boundaries.

4. The Authority should evaluate merits and economics of operating 17 green box sites and consider consolidation of some sites.
5 Green box sites should be refurbished with compactors and bottle filling arrangements so that the rail haul bottles can be filled and transported directly to rail cars (similar to the operations at Cooke City). 24-hour access to green box sites should be re-evaluated and possibly curtailed so that the sites can be economically manned during operating hours.
6 The following modifications should be made in the operations of the Green Box Sites to make them easier and more efficient to manage while offering a higher level of service. Modifications could include the following:
    - Established days and hours of operation.
    - Elimination of small "green box" dumpsters.
    - Use of roll – off containers and / or compaction units for trash storage as at Cooke City.
    - Partially or fully enclosed building that can be locked.
    - Larger containers for recyclables that are simple to maintain, don't overflow, and don't need to be emptied so frequently.
7. Multiple solid waste committees should be consolidated into one advisory committee that reports to the joint authority. This new advisory committee should have a diverse representation and must be represent the entire community of Park County.
8. Consider setting up Central Recycling and Reuse Center
9. Consider adoption of solid waste diversion goals and timelines
10. A small incinerator facility to handle MSW at Cooke City should be considered as an alternative to hauling solid waste through Yellow Stone National Park during inclement weather. Air emission requirements for a small incinerator facility may be exempted making such a facility economically feasible.
11. Court decree of 1981 **(Sundling v. Park County**) (Appendix A) restricting disposal of MSW in the existing permitted Park County Class II landfill should be re-visited and re-negotiated for gaining concessions.

# 1 Introduction

## 1.1 Background

Park County owned and operated a Class II Municipal Solid Waste (MSW) landfill in the early eighties. Under a 1981 court order (**Sundling v. Park County**) (see Appendix A), Park County was prohibited from disposing of MSW in this landfill. More specifically, the restriction on disposal of MSW in the landfill stemmed from nuisance caused by migration of debris such as paper and plastics wind-blown from the landfill upon the plaintiff's (Raymond R. Sundling) property. In response to the court order and to mitigate the wind-blown debris nuisance, Park County constructed a MSW incinerator in 1982. This incinerator was operated until 2005. In April, 2005 the incinerator was taken out of service because it was not in compliance with federal air emission standards. The County had determined it was not economically and operationally feasible to bring the facility into compliance. Historically, the County had problems keeping the incinerator under regulatory compliance. The County was cited on many occasions by the Montana Department of Environmental Quality (DEQ) and on March 26, 1996 a court decree (**State of Montana Department of Health and Environmental Science v. Park County**) (see Appendix B) was entered, stipulating adherence to certain operational parameters for the incinerator and a civil penalty of Ten Thousand Dollars ($10,000) was levied against the county.

The unlined landfill operated by the County is not allowed to accept all types of MSW as a result of the 1981 **Sundling v. Park County** court order. In an effort to find an interim solution to solid waste disposal, the County established a transfer station at the incinerator site and engaged a private contractor (Envirocon, Inc.) to transport municipal solid waste by rail to the privately owned and operated Valley View Landfill. Valley View Landfill is located in Jefferson County on Highway 518 between East Helena and Montana City. Under this arrangement the cost to the County for transport and disposal of trash is currently about $38 per ton. This fee will increase with time per the escalation provisions of the contract between the County and Envirocon.

The City of Livingston has historically provided refuse collection service to residential and commercial generators in the City. City trucks hauled waste to the incinerator for disposal under a contractual agreement with the County. Subsequent to the closure of the incinerator, the City and County negotiated a temporary Inter – Local Agreement wherein, the City has contracted with the County for disposal of its refuse through the transfer station at the rate of $55 per ton. The agreement took effect on November 2, 2005.

The City and County view the current approach to solid waste management, summarized above, as a temporary response to difficult circumstances undertaken out of necessity, and not as the result of a full investigation of alternative strategies for handling refuse from the City and County unincorporated areas. The City and County have taken two important steps toward developing and implementing a long – term strategy:

(1) These entities have joined together with the Town of Clyde Park to form a Joint Inter – Local Solid Waste Subcommittee for discussion and examination of alternative strategies. The term of this sub-committee has expired and is currently not active.

(2) City of Livingston and Park County jointly contracted with Zia Engineering & Environmental Consultants, LLC (Zia) for the preparation of this Solid Waste Management Plan to provide recommendations regarding such strategies.

Based on recommendations provided by Zia, the City and County will be evaluating the potential for formation of an entity that will implement, administer, and manage solid waste programs / policies for both the City and County on a county-wide basis.

## 1.2 Purpose

The purpose of this Plan is to systematically review options and determine priorities / directions for both the City of Livingston and Park County regarding solid waste management operations, programs and policies. The Plan describes current and recommended methods, arrangements, and facilities for:

- Waste reduction,
- Materials recycling,
- Refuse collection,
- Transportation, processing, and disposal of waste,
- Organization and administration of solid waste operations, programs and policies.
- Regulatory Impacts

The data, information, analysis, conclusions and recommendations in the Plan encompass the planning period from 2005 to 2025.

## 1.3 Methodology and Process

The starting point for this Plan is the concept of the solid waste management system. The solid waste management system for Livingston / Park County is composed of various elements or components that have their separate roles and responsibilities but also interact with each other to create overall characteristics and results. The system – wide perspective seeks to examine each major system element while also analyzing their mutual, cumulative interactions and impacts. The major system components are:

| **Operations** | **Programs** | **Policy** |
|---|---|---|
| Refuse collection | Waste prevention / reduction | Management / administration |
| Refuse handling | Materials recovery / recycling | Regulatory impacts |
| Refuse transport | Organizational structure | |
| Refuse disposal | | |

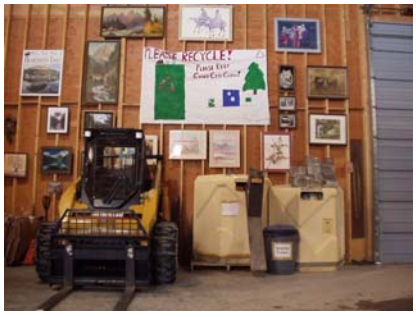
This plan examines the following relevant questions:

*Do the operations of the various system components reflect a comprehensive approach and direction that is consistent or are there pieces that are in conflict with one another?*

*Is there a common agenda the system was designed to implement, or different purposes that are competing for resources?*

### *Operations*

### *Programs*




### *Policy*

This framework allows evaluation of alternative functions, roles, and responsibilities for the operational components from the viewpoint of how they impact inter – relationships between those components and the system as a whole. In proposing changes to the present solid waste management methods it is important to be aware of what the likely results will be and who will be most significantly impacted. The issue is one of equity that is, trying to achieve a balanced distribution of the impacts rather than having them concentrated disproportionately on one portion of the community or group of stakeholders.

## 1.4 Public Participation

Professionals from Zia spent considerable time meeting with elected officials, staff of the City and County, and attended several public meetings and forums to collect data and seek feedback at the onset of this solid waste management plan. Analysis and recommendations contained in this plan will be presented by staff of Zia at various public meetings throughout the County. At these meetings Zia staff will be available to respond to questions from the public.

# 2 Relevant Local Conditions

## 2.1 Waste Groups and Types of Disposal Facilities

According to Administrative Rule of Montana 17.50.503, "Solid wastes are grouped based on physical and chemical characteristics which determine the degree of care required in handling and disposal and the potential of the wastes for causing environmental degradation or public health hazards." Solid wastes in Montana are categorized into three groups as summarized in the table below.

**Table 2.1-A: Solid Waste Groups and Categories**

| Waste Group | Waste Category | Examples of Materials |
|---|---|---|
| Group II | Decomposable Wastes and Mixed Solid Wastes (excluding regulated hazardous wastes) | Municipal and Household Solid Wastes such as organic materials, paper, cardboard, glass, metal, plastics.<br><br>Commercial and Industrial Wastes such as packaging materials, liquid or solid industrial process wastes, crop residues, chemical fertilizers. |
| Group III | Wood Wastes and Non – Water Soluble Solids | Inert solid waste such as unpainted brick, dirt, rock, and concrete, industrial mineral wastes, untreated wood materials, and vehicle tires. |
| Group IV | Construction and Demolition Wastes | Construction or demolition wastes and asphalt (excluding regulated hazardous wastes). |

These waste groups are disposed in the proper corresponding waste facilities according to Administrative Rule of Montana 17.50.504, as follows:

> "Disposal facilities are classified according to their respective abilities to handle various types of solid waste. Systems of acceptable disposal may entail containment of waste with assured protection against leachate migration or may take advantage of natural treatment processes such as evaporation, chemical and microbiological degradation, filtration, adsorption, and attenuation. Solid waste management facilities may involve ponds, pits, lagoons, land spreading areas, impoundments, or landfills. Although facilities are broadly classified as to the solid waste groups they may accept, specific restrictions may be placed on individual disposal units or disposal areas. As an example, many Class II landfills may not be acceptable places for the disposal of Group II liquids or sludges. Such restrictions, if any are warranted, shall be specified on the solid waste management system license."

The three types of disposal facilities are summarized in the table below.

## Table 2.1-B: Types of Disposal Facilities

| Facility Class | Type(s) of Refuse Accepted | Exceptions |
|---|---|---|
| Class II | Group II, Group III, Group IV (does not include regulated hazardous wastes) | Some Class II landfills will be unable to accept certain types of refuse as specified by the specific solid waste management system license. |
| Class III | Group III only | No exceptions |
| Class IV | Group III or Group IV | Conditionally exempt small quantity generator hazardous waste that is generated as a part of a construction or demolition project and that cannot be removed from the construction and demolition waste may be included in waste disposed of in Class IV units. |

The table below shows the correlation between the waste groups and disposal facility types:

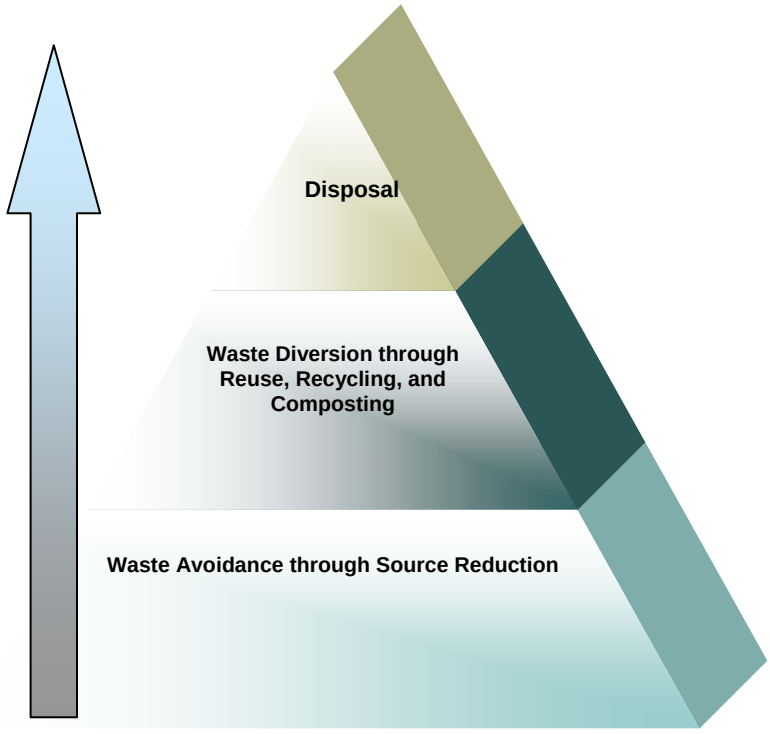
## Table 2.1-C: Correlation Between Waste Groups and Disposal Facility Types

| Waste Group | Waste Category | Examples of Materials | Disposal Facility |
|---|---|---|---|
| Group II | Decomposable Wastes and Mixed Solid Wastes (excluding regulated hazardous wastes) | Municipal and Household Solid Wastes such as organic materials, paper, cardboard, glass, metal, plastics.<br><br>Commercial and Industrial Wastes such as packaging materials, liquid or solid industrial process wastes, crop residues, chemical fertilizers. | Class II |
| Group III | Wood Wastes and Non – Water Soluble Solids | Inert solid waste such as unpainted brick, dirt, rock, and concrete, industrial mineral wastes, untreated wood materials, and vehicle tires. | Class II Class III Class IV |
| Group IV | Construction and Demolition Wastes | Construction or demolition wastes and asphalt (does not include regulated hazardous wastes). | Class II Class IV |

## 2.2 Solid Waste Management Policies and Priorities

Montana has adopted the "Reduce, Reuse, and Recycle" approach in waste management according to the State's Integrated Waste Management Plan (IWMP, Final Draft, 2006).

### Figure 2.2-1: Hierarchies of Waste Management Priorities




Furthermore, it is understood Montana has established goals for decreasing and diverting the amount of solid waste that is generated statewide through source reduction, reuse, recycling, and composting measures and programs. The target waste reduction / diversion rates and timeframes are:

- 17 % by 2008
- 19 % by 2011
- 22 % by 2015

In particular, the IWMP asserts (page 75) "The State of Montana will regulate solid waste incineration and enforce laws to protect the public health and welfare of Montana citizens. Source reduction, reuse, composting, and recycling of materials will be encouraged as a preferred alternative to incineration of solid waste."

## 2.3 Physical, Geographic, and Geological Characteristics

### Geography

Park County encompasses approximately 2,666 sq mi located in the southern portion of the state. The region is drained by the Yellowstone and Shields Rivers and borders Yellowstone National Park on the south. Farm land within the County produce many different types of crops including wheat, barley, oats, hay, vegetables. Other types of industries include cattle, sheep, hogs, horses; dairying; lumber, marble and coal.

Park County is a product of the railroad. The Northern Pacific founded Livingston in 1882 and provided thousands of jobs. The branch line south to Yellowstone carried countless tourists throughout the years, as well as provided the local residents transportation to and from their ranches. To the north, the Shields Branch Line helped create the Towns of Wilsall and Clyde Park, and each year in the fall that same line carried the farmers' wheat and livestock off to market.

Cities and areas of interest are located throughout the County. Conical Peak is located within the Crazy Mountains in the northeastern portion of the County where mouth of the Shields River originates. The Gallatin National Forest is located on the western portion of the County extending to the southwestern corner. The Absaroka Beartooth Wilderness is located on the southern portion of the County extending to the southeast corner through the Beartooth Mountains where Granite Peak (elev. 12,799 ft), the highest point in Montana, is located. Cooke City and Gardiner are located in the southern portion of the County. Wilsall and Clyde Park are located in the northern portion of the County. Livingston is the county seat in Park County. It is here that the Rocky Mountains give way to the plains that stretch to the horizon, the Blue Ribbon trout streams turn and head to the Mississippi River and the Big Sky opens wide. Livingston, Montana is located in the central portion of the County where Interstate 90 and US Highway 89 converge and lies on the western banks of the Yellowstone River. Elevations near Livingston reach highs of approximately 6500 feet and lows of 4500 feet near the River. Slopes of the surrounding mountains vary from 0-70 percent. The spacious valleys and rugged mountains give residents and visitors room to breathe and enjoy an unfettered lifestyle in a scenic environment.

### Seismic Activity

Seismic activity has been observed in the Livingston area. According to the United States Geological Society (USGS), Montana is one of the most seismically active States in the Union. Montana's earthquake activity is concentrated mostly in the mountainous western third of the State which lies within a seismic zone that includes southeastern Idaho, western Wyoming and central Utah. Most of the strong earth quakes in Montana have occurred in this seismic zone, where the City of Livingston is located.

### Climate

The Continental Divide splits Montana in two distinct climatic regions. West of the Divide, the climate is influenced strongly by mild marine air from the Pacific Ocean, and in the east harsher continental patterns prevail.

Montana is also home to substantial dry spells which can be as striking as its extremes in hot and cold. Average rainfall for the western part of the state is 18 inches a year; 13 inches for the east. Average rainfall for Livingston is approximately 15.8 inches a year.

The average high temperature for Livingston over the warmer months (March through August) is approximately 68 degrees. Historically, the warmest months are July and August. By the time September rolls around, the weather takes a slight change with cooler and wetter conditions prevailing. Weather doesn't usually get severe until the end of November with roads staying clear until that point.

Winter cold is the greatest weather concern in Montana. The average low temperature for Livingston over the colder months (September through February) is approximately 26 degrees. Roads can be hazardous if snow-covered, and incremental melting leaves small, invisible patches of black ice on the road.

**Soils**

Based on the large land area that the County encompasses, the soil types were focused on the Livingston area. Approximately eight different mixtures of soil types were identified in the area, which make up over 75% of the total soil constituents. These types are identified as Ethridge-Urbanland-Kremlin-Yamacall complex (5%), Beaverell cobbly-Beavwan complex (10%), Glendive-McCabe-Ryell complex (10%), Ethridge-Kremlin-Yamacall complex (5%), Whitecow extremely gravelly-Windham/very cobbly-Kiev-Windham stony complex (15%), Ethridge-Tanna-Tolbert complex (10%), Reedpoint-Tanna-Ethridge complex (15%), Bacbuster-Sawicki-Corbly complex (5%).

The Glendive series consists of very deep, moderately well or well drained soils that formed in stratified loamy calcareous alluvium. These soils are on flood plains and stream terraces. Slopes are 0 to 8 percent.

The Kremlin series consists of very deep, well drained soils that formed in alluvium from mixed rock sources, semiconsolidated sedimentary beds, or alluvium from glaciofluvial deposits. These soils are on alluvial fans, stream terraces, sedimentary plains, drainageways, and till plains. Slopes are 0 to 25 percent.

The Beaverell series consists of very deep, well drained soils that formed in alluvium or glacial outwash that is 10 to 20 inches deep over very gravelly loamy sand or very gravelly sand. These soils are on stream terraces, outwash terraces, kames, eskers and alluvial fans. Slopes are 0 to 35 percent.

The Ethridge series consists of very deep, well drained soils that formed in alluvium and glaciofluvial deposits from mixed rock sources, and/or in till and lacustrine deposits. These soils are on alluvial fans, stream terraces, drainageways, hills, sedimentary plains, lake plains, and till plains. Slopes are 0 to 35 percent.

The Tanna series consists of moderately deep, well drained soils that formed in residuum weathered from semiconsolidated shale, mudstone, or siltstone, or in glaciofluvial

deposits or alluvium over the bedrock. These soils are on alluvial fans, strath terraces, escarpments, sedimentary plains, till plains, and hills. Slopes are 0 to 45 percent.

The Yamacall series consists of very deep, well drained soils that formed in alluvium or colluvium derived from sedimentary rock. These soils are on alluvial fans, fan remnants, stream terraces, escarpments, drainageways, sedimentary plains, ridges and hills. Slopes are 0 to 45 percent.

The Bacbuster series consists of moderately deep, well drained soils that formed in interbedded sandstone and shale residuum. These soils are on sedimentary plains, hills and escarpments. Slopes are 2 to 45 percent.

The Reedpoint series consists of very shallow, well drained soils that formed in residuum or colluvium weathered from sandstone. These soils are on bedrock-floored plains, escarpments, hills and mountains. Slopes are 0 to 75 percent.

The Whitecow series consists of very deep, well drained soils that formed in alluvium and colluvium from limestone. These soils are on mountains, hills, and alluvial fans. Slopes are 0 to 80 percent.

Further information and research on the area's soil characteristics is available on the Natural Resources Conservation Service (NRCS) Web Soil Survey (http://www.mt.nrcs.usda.gov/soils/ ).

## 2.4 Demographic Information and Growth Rates

Solid waste management planning is based partly on future projections of the amount of material disposed, diverted, and generated, according to the definitions and equation for waste disposal, diversion and generation:

*Quantity of Waste Generated = Disposed Tons + Diverted Tons*

In order to project future quantities of material disposed, diverted, and generated (see Section 4), population estimates for the planning area must be developed using reasonable growth rate assumptions. This section explains the methodology used in deriving population projections for the City of Livingston, Unincorporated Park County (areas outside of Livingston but including Clyde Park), and the entire County for the period 2005 to 2025 (the 20 year planning timeframe of the Solid Waste Management Plan).

The population projections utilize U.S. Census Bureau data (http://factfinder.census.gov/home/saff/main.html?_lang=en) (Appendix C, 2000 Census Data for Livingston and Park County, Montana). For purposes of consistency, City of Livingston information for the year 2004 from the Census was assumed to be applicable to the base year of 2005. The 2005 population of Park County was reported by the U.S. Census as 15,968 while the population of the City of Livingston was 7,062.

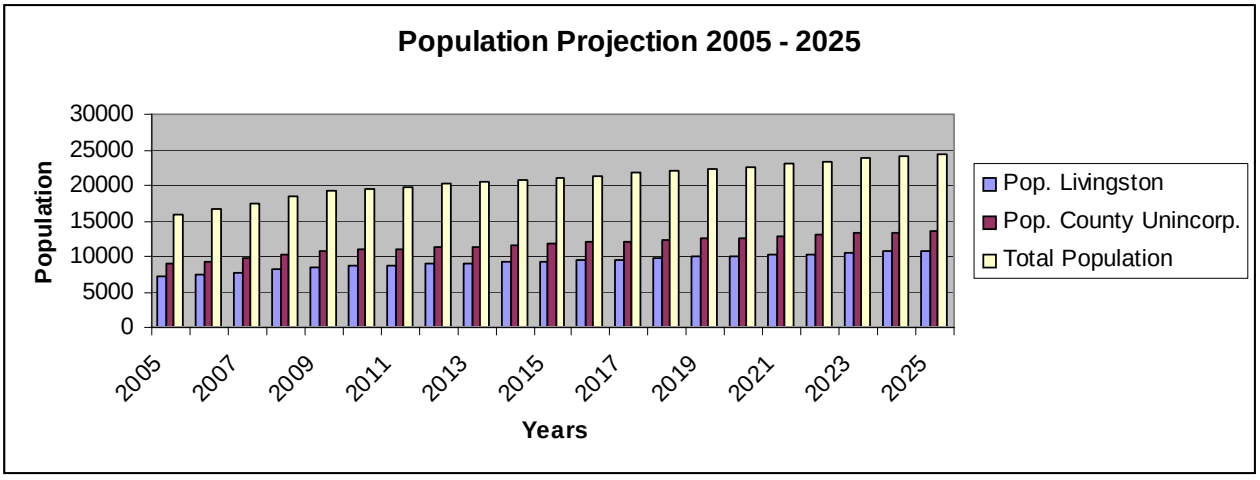
Separate growth rates were calculated for the City of Livingston and Unincorporated Park County. The baseline populations are therefore as follows:

| | |
|---|---|
| 2005 Total Park County Population | 15,968 |
| Subtract 2005 City of Livingston Population | -7,062 |
| 2005 Unincorporated Park County Population | 8,906 |

An annual population growth projection is calculated separately for the City of Livingston and Unincorporated Park County from the 2005 base year data through the year 2025. The annual calculations are then added together to create a projection for Total Park County Population each year.

Based on discussions with City and County representatives, a 4.8% growth rate was assumed for the first five years of the 20-year planning period. The remaining 15 years use a growth rate of 1.5% per year. The 1.5% growth rate is also applied to both the City and Unincorporated County. These growth rates take into consideration the population surge that is presently occurring in the City and County and is believed likely to continue for several years and then gradually slow down. The population projections are presented in Appendix D and a graphical representation is provided below.

## Figure 2.4-1 Population Projection




It is prudent in solid waste management strategy and facility development to plan conservatively, that is, to anticipate disposed waste quantities somewhat higher than the historical solid waste generation. To verify that the 4.8 % and 1.5 % growth rate figures are prudently conservative, these rates were compared to the actual growth rates experienced historically. Therefore, growth rates for 1990 to 2005 and then for the

more recent time span of 2000 to 2005 were calculated for comparison. These calculations were performed for both Livingston and the Unincorporated County.

Using U.S. Census information for 1990 and 2005 for the City of Livingston and Park County, annual growth rate was calculated. The calculation for the City of Livingston growth rate was determined as follows:

| | |
|---|---|
| Population of Livingston, 1990 | 6,700 |
| Population of Livingston, 2005 | 7,062 |

For the 15-year span between 1990 to 2005, growth rate per year, was computed based on the following equation:

| | | |
|---|---|---|
| a. | 6,700 x $\mathbf{(X)}^{15}$ = 7,062 | (1990 Livingston Pop. times Unknown growth rate over 15 years equals 2005 population) |
| b. | $\mathbf{(X)}^{15}$ = 1.054029851 | (Solve for **X**) |
| c. | **X** = 1.003514212 | (Growth Rate) |
| d. | (1.003514212 – 1) x 100 = **0.35%** | (Growth Rate minus 1 times 100 equals growth rate percentage) |

Solving for X produces an average growth rate of 0.35 % over the 15 year period from 1990 to 2005 in the City of Livingston.

Similar calculations were performed for Unincorporated Park County. The 1990 Unincorporated Park County data was extracted in the same manner as the 2005 data. The following calculation explains the data used:

| | |
|---|---|
| 1990 Park County Population | 14,562 |
| Subtract 1990 Livingston Population | -6,700 |
| Total 1990 Unincorp. County. Population | 7,862 |

The following calculation was then used to find the growth rate:

| | | | |
|---|---|---|---|
| a. | 1. | 7,862 x **(X)**$^{15}$ = 8,906 | (1990 Uninc. Cty. Pop. times Unknown growth rate over 15 years equals 2005 Uninc.Cty. Pop.) |
| b. | 2. | **(X)**$^{15}$ = 1.132790639 | (Solving for **X**) |
| c. | 3. | **X** = 1.008346922 | (Growth Rate) |
| d. | 4. | (1.008346922 – 1) x 100 = **0.83%** | (Growth Rate minus 1 times 100 equals growth rate percentage) |

Solving for X produces a 0.83 % average growth rate that was experienced annually from 1990 to 2005 for Unincorporated Park County.

For the period 2000 to 2005 a similar set of calculations were performed to yield the average annual population growth rates for the City and County unincorporated areas.

Using US Census information from 2000 and 2005 for the City of Livingston and Park County, annual growth rate was calculated. The calculation for the City of Livingston growth rate was determined as follows:

| | |
|---|---|
| Population of Livingston, 2000 | 6,850 |
| Population of Livingston, 2005 | 7,062 |

The difference between 2000 and 2005 is 5 years. To find a growth rate per year, the following equation was used:

| | | | |
|---|---|---|---|
| a. | 6,850 x **(X)**$^{5}$ = 7,062 | | (2000 Livingston Pop. times Unknown growth rate over 5 years equals 2005 population) |
| b. | **(X)**$^{5}$ = 1.030948905 | | (Solve for **X**) |
| c. | **X** = 1.006114547 | | (Growth Rate) |
| d. | (1.006114547 – 1) x 100 = **0.61%** | | (Growth Rate minus 1 times 100 equals growth rate percentage) |

Solving for X produces an average growth rate of 0.61 % that was experienced annually for the period of 2000 to 2005 in the City of Livingston.

The population of Unincorporated Park County was calculated similarly. The 2000 Unincorporated Park County data was extracted in the same manner as the 2005 data. The following calculation explains the data used:

| | |
|---|---|
| Park County Population, 2000 Census | 15,694 |
| Subtract Livingston Population, 2000 Census | -6,850 |
| Total 2000 Uninc. County Population | 8,844 |

The following calculation was then used to find the growth rate:

| | | |
|---|---|---|
| a. | 1. 8,844 x $\mathbf{(X)}^5$ = 8,906 | (2000 Park County Pop times Unknown growth rate over 5 years equals 2005 Park County Pop) |
| b. | 2. $\mathbf{(X)}^5$ = 1.007010403 | (Solving for **X**) |
| c. | 3. **X** = 1.001398165 | (Growth Rate) |
| d. | 4. (1.001398165 – 1) x 100 = **0.14%** | (Growth Rate minus 1 times 100 equals growth rate percentage) |

Solving for X produces an average 0.14 % growth rate that was experienced annually from 2000 to 2005 in Unincorporated Park County.

Average Annual Growth Rate of 4.8% for the period of 2005 to 2010 appears quite conservative when compared to historical growth rate as demonstrated above. However, this growth rate is consistent with Park County's 5-year Comprehensive Plan recently approved by the Board of County Commission. 1.5% average annual population growth for the 15 year planning period is also quite conservative. However, this growth rate may be realistic if the population indeed increases at the rate of 4.8% for the first 5 years of the planning period. As population increases, improved infrastructure in Livingston and Park County and enhanced commercial activity may promote migration to this pristine part of Montana. Thus, planning for solid waste generation based on such conservative population projection is prudent since it will yield solid waste infrastructure that will likely outlast the planning horizon of 20 years.

## 2.5 Political / Institutional Structures and Responsibilities

Park County is governed by a Board of County Commission consisting of three members. The County's Operations Director is responsible for County solid waste management operations including the operation of the Park County Landfill, the Park County Transfer Station, the Green Box Sites, and the contract with Envirocon, Inc. for rail transport and disposal of refuse. County employees conduct daily service and maintenance activities at the landfill, transfer station, and Green Box Sites.

The City of Livingston is governed by a City Commission consisting of five members. The City Manager is in charge of the various City departments and reports to the City Commission. Solid waste management operations within Livingston are the responsibility of the Public Works Director who reports to the City Manager. The City provides residential and commercial refuse pickup with its own vehicle fleet and employees. Trash is then taken to the County Transfer Station for transport and disposal.

## 2.6 Status of Landfill and Transfer Station Sites

The County has leased 1.8 acres for the existing waste transfer operation with another 1.5 acres available to lease for expansion of the Transfer Station and / or other solid waste management activities, including waste diversion.

The unlined Park County Landfill is licensed as a Class II landfill which means it can accept Group II, III, and IV waste materials (refer to Section 2.1). Approximately five out of the 14 acres at the landfill site are presently being used for disposal. For the current five acre footprint, it is expected that disposal can continue at the existing rate for about 24 more years to fill to the final planned contours which are 30 to 40 feet above the surrounding ground level.

According to information provided by the Montana DEQ, the Park County Landfill could take ash produced from the incineration of municipal solid waste under the terms of its operating license. Incinerator ash is considered a Group II waste and the landfill is licensed to dispose of materials in this category. However, there are other federal and state regulatory limitations on the disposal of incinerator ash that are discussed in subsequent sections of this plan.

There is an important limitation on the landfill's operation that should be emphasized, since it impacts the disposal options available to the County and City of Livingston. Due to the 1981 **Sundling v. Park County** Court decree (Appendix A), municipal solid waste from the residential and commercial sectors may not be disposed at the landfill. This is the material stream now handled by the transfer station. The types of materials acceptable at the landfill are bulky, over – sized items that do not readily decompose such as inert debris from construction / demolition projects. Section 3.2.2 discusses in greater detail the kinds of materials typically disposed at the landfill.

The court decree restricts Park County Landfill as an option for the County or City to dispose its MSW. However, the landfill is a valuable resource for the material stream it can accept because these are items that are heavy, hard to handle, difficult to compact, and therefore costly to transport in comparison to MSW. The viability of this resource should be protected and extended to the maximum extent feasible.

## 2.7 Regional Solid Waste Facilities

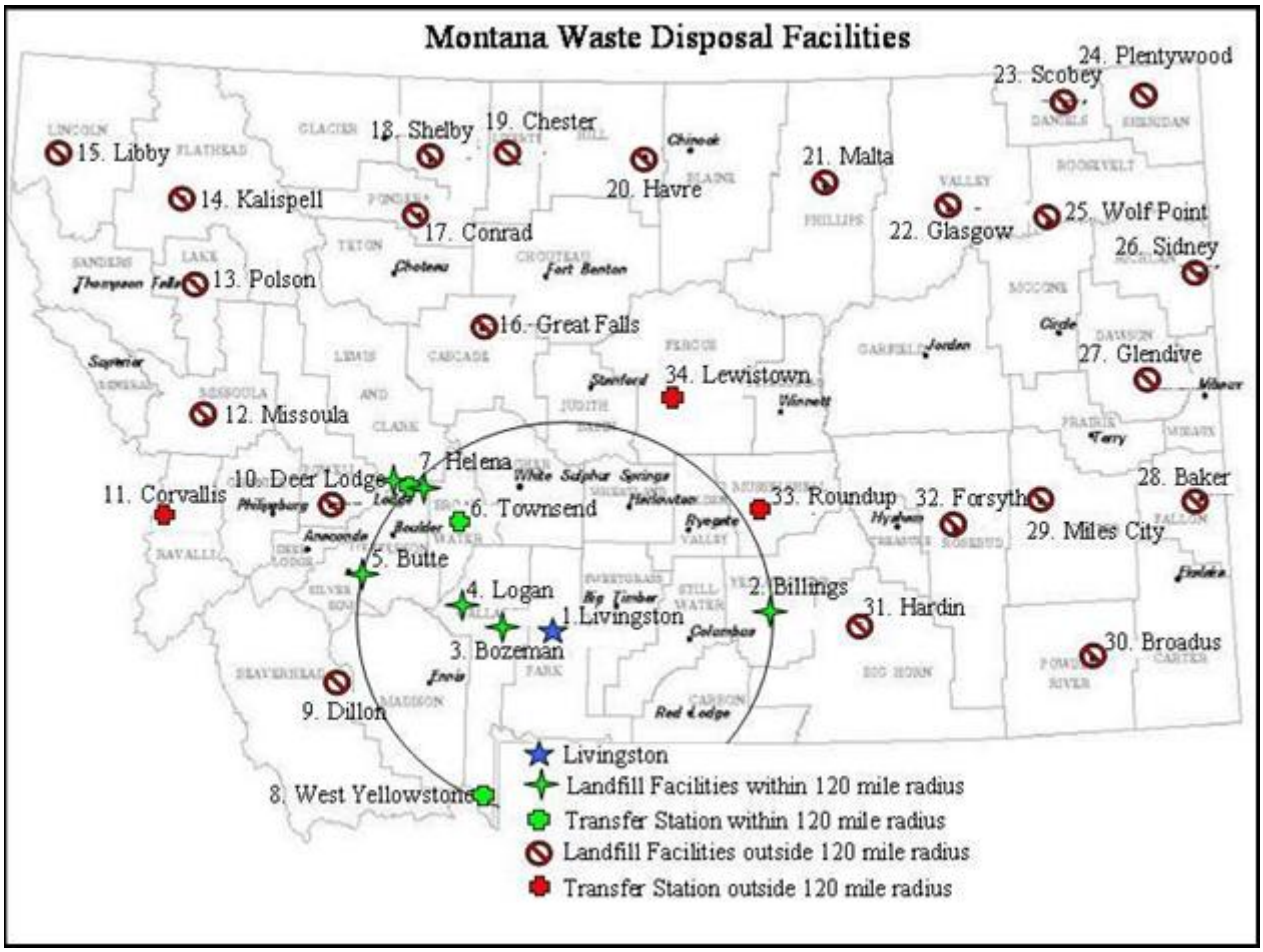
To assess disposal options available to the City and County, research was conducted into the location of transfer stations and landfills in Montana. The most currently available information on these facilities was provided by the Montana DEQ. Emphasis was placed on facilities within an approximate radius of 120 miles from Livingston (considered the rough geographical center of the County) to include the Valley View Landfill (where trash is now being hauled by rail) as well as other sites. A map of the Montana Waste Disposal Facilities is provided at the end of this section. An associated reference table of the facility locations is provided in Appendix E.

DEQ offered several comments concerning disposal options available to the City and County, as follows:

- The City of Billings Landfill in Yellowstone County will not accept any refuse from an area outside of adjacent counties. Park County does not share a border with Yellowstone County and therefore would be unable to utilize the City of Billings Landfill for disposal.
- The Bozeman City Landfill is scheduled to close in the near future and refuse from the City is going to be redirected to Logan Landfill, the Gallatin County landfill. Due to the increased refuse flow from Bozeman and a booming population, the Logan landfill might not be a realistic option.
- The tipping fee at the Butte / Silver Bow Landfill in Butte would be expensive relative to other options because of a lack of interest in accepting additional refuse from outside Silver Bow County.

- In the vicinity of Helena there is one transfer station operated by the City, the Lewis and Clark County Landfill, and the privately operated Valley View Landfill which Park County and the City of Livingston are currently utilizing for refuse disposal.
- The High Plains Sanitary Landfill Site 1 in Great Falls, approximately 150 miles to the north of Livingston, is actively seeking tonnage from outside the immediate area for the landfill and offers a reduced tipping charge to offset a potentially greater hauling fee.

## Figure 2.7-1: Montana Waste Disposal Facilities



# 3 Existing Solid Waste Management Practices

## 3.1 City of Livingston

### 3.1.1 Residential and Commercial Refuse Collection

The main features of the City's residential refuse collection service area are as follows:

- Residences are provided with one 96 – gallon trash cart.
- Fully automated trucks operated by one person are used for picking up and emptying residential carts on a weekly basis.
- Standard rate is $ 163.44 / year or $ 13.62 / month. There is an extra charge of $13.62/month for each additional cart used.
- The trucks are capable of weighing each cart that is emptied and keeping a record of those weights.
- Carts are placed either at curbside or in alleys for collection.

Trash from the commercial sector is placed in large, 300 – gallon plastic containers located outside. The containers are picked up and emptied by fully automated trucks that can weigh the containers. Refuse collection rates for commercial accounts vary according to the amount collected and the frequency of collection. Every 40 pounds of commercial garbage is charged at the rate of approximately $ 2.60; this equates to $130/Ton.

The City's Department of Public Works solid waste operation serves about 2,793 residential accounts and 342 commercial accounts. The solid waste program has an annual budget that varies between $420,000 and $460,000. The program is a self – supporting enterprise fund with rates covering expenditures and no supplemental support from the City's General Fund. According to the Public Works Department, it costs around $ 143/Ton for all services of the solid waste program operation including refuse collection, recycling, and composting. However, this excludes the $55/Ton paid to Park County for transfer, rail-haul and disposal. Thus, the total cost of solid waste management incurred by the City currently is approximately $198/Ton.

### 3.1.2 Waste Disposal

MSW collected by City crews is taken to the County – operated Transfer Station, compacted into specially designed rail-haul containers (called bottles), and transported by rail to the Valley View Landfill in Jefferson County approximately 120 miles from Livingston. The County charges the City $ 55/Ton for refuse transfer and disposal.

City residents may dispose of Group III or IV waste directly at the County – operated landfill for a fee of $ 75/Ton.

### 3.1.3 Composting Operation

From May to November the City provides separate collection of green or yard waste from residences on a weekly basis. The recovered material is directed to the City's composting operation located adjacent to the Public Works Yard. In the 2004 calendar year 141 tons of green waste was picked up while for calendar year 2005 this amount increased to 162 tons. The City is assessing the feasibility of adding sewage sludge and food waste to the yard waste composting operation. Some but not all residences have carts for storage of yard waste that are emptied with a fully automated truck. The City intends to have this approach implemented on a citywide basis.

Compost or soil amendment is used on City properties and will be made available to residents in the future when more compost is available. The composting operation is near a residential neighborhood and the operation itself is getting larger as more material is recovered. For these reasons it is likely the composting operation will have to be eventually moved.

### 3.1.4 Recycling Program

The City recovers about 15 tons of cardboard per month from commercial / institutional generators. There are about 15 to 20 dumpsters dedicated to cardboard recovery. The cardboard is collected using rear – loading packer trucks. The City was taking cardboard to the Transfer Station for baling. However, the amount of cardboard recovered by the City has increased and can no longer be handled at the Transfer Station due to various constraints including limited operating space, staffing at transfer station and the time it takes to prepare bales. The City now compacts the cardboard in the collection trucks and transports it directly to Pacific Steel in Bozeman.

The City set aside an area near the composting operation on land adjacent to the Public Works Yard for the accumulation, grinding, and crushing of asphalt and concrete. The crushed asphalt and concrete is reused by the City for public works projects.

The City is assessing the feasibility of recovering glass food and beverage containers and processing the material with a pulverizer. Pulverized glass has several potential applications such as for surfacing, drainage, or concrete aggregate, for bedding, and as backfill material. The City submitted a grant application to the State of Montana for purchase of a glass pulverizer. The spring, 2006 Informational Brochure from the Public Works Department notes the following:

> "The amount of glass produced by our local restaurants, bars and residences could be made into useful materials instead of ending up in a landfill. The pulverized glass has no sharp edges and is safe enough to be used for sanding material, bike paths, landscaping materials, and many other uses. The glass pulverizer would not only cut down on the amount of waste produced but would also decrease the amount of sand the City would need to purchase for construction projects."

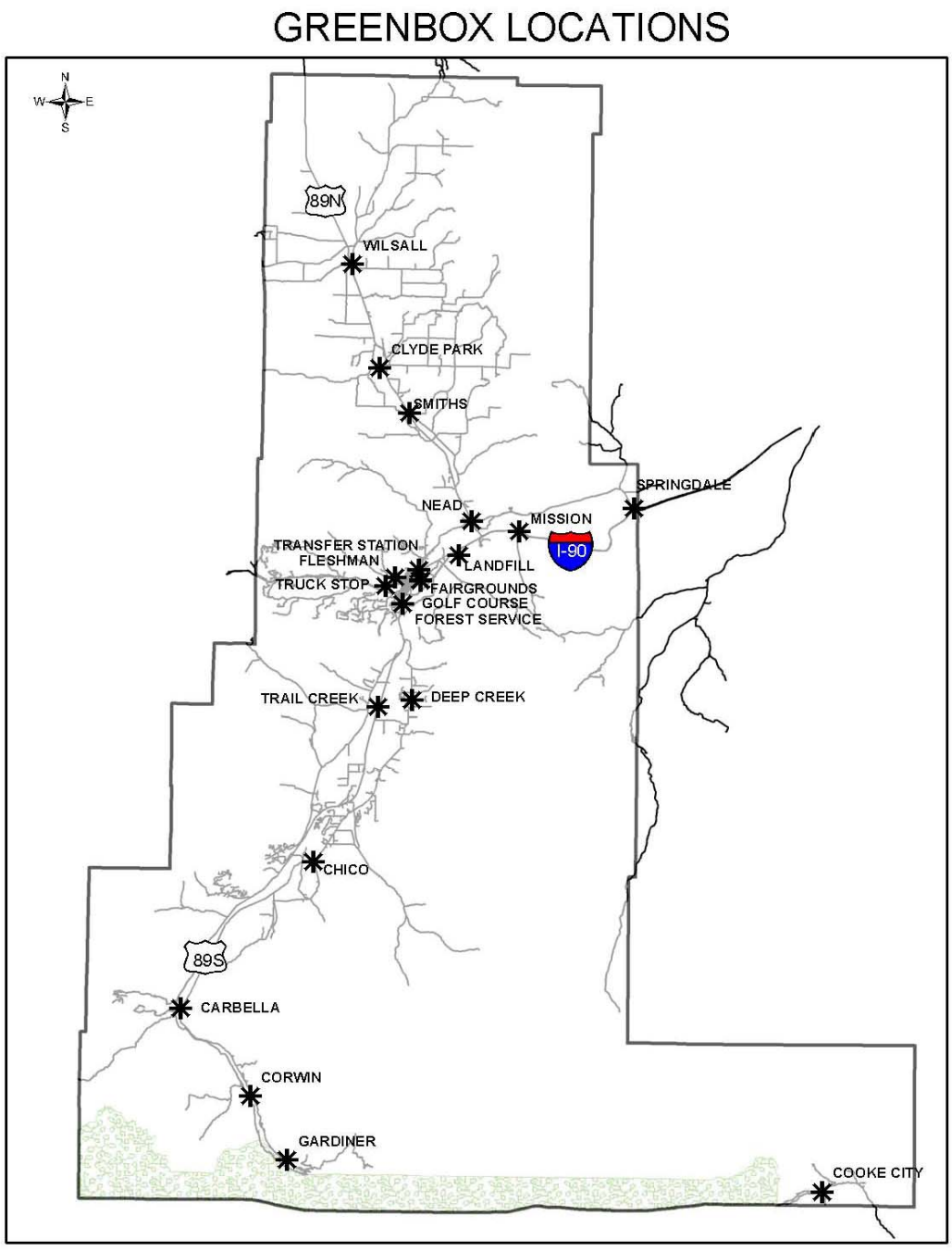
## 3.2 Park County

### 3.2.1 Green Box Sites

There is no refuse collection service for residences or businesses in the County unincorporated areas (including Clyde Park) outside the City of Livingston jurisdictional boundary. Instead there is a network of Green Box Sites or convenience centers for refuse disposal located throughout the County intended to serve the County unincorporated areas. The map in this section shows the convenience center locations as well as the Park County Transfer Station and Park County Landfill.

There are five full – time and two part – time attendants who rotate between the various (17) Green Box Sites. The Sites are supposed to be closed on Wednesday, Sundays, and Holidays. However, walk – through gates at the sites are always open, so in reality access is unrestricted. All the convenience centers have dumpsters or "green boxes" for disposal of household and commercial trash. Seven locations also have larger roll – off containers for larger bulky items such as construction / demolition waste, metal, wood, furniture, appliances (no Freon), mattresses, and carpet. These seven sites include Clyde Park, Wilsall, Springdale, Trail Creek, Chico, Gardiner, and Cooke City. There is also a roll – off container at the Transfer Station.

## Figure 3.2.1-1: Green Box /Convenience Center Locations




Created By the City of Livingston & Park County GIS Department, 2005
This DATA is neither a legally recorded map nor a survey and is not intended to be used as such. No representation is made that features presented accurately reflect true location or correct attribution. The City of Livingston and Park County assumes no liability for any errors or omissions herein. DATA layers are under continued development; therefore, the DATA is current only to the date of delivery.

A front – end loading refuse vehicle is used to empty the dumpsters' solid waste from the green box location and is trucked to the Transfer Station. Roll – off containers are hauled directly to the Park County Landfill.

The Cooke City convenience center is distinctly different than the other Green Box Sites. The facility at Cooke City is fully enclosed; has a compaction unit / container for regular residential / commercial trash and a roll – off for larger bulky items; bales recovered cardboard with a small downstroke baler; and serves as a community recycling depot.

### 3.2.2 Landfill

As discussed in Section 2.6, due to the 1981 **Sundling vs. Park County** Count Decree (Appendix A), municipal solid waste from the residential or commercial sectors may not be disposed at the Park County Landfill. However, as a Class II landfill the facility can accept other kinds of Group II, III, and IV wastes. Typical materials disposed at the landfill include construction / demolition debris, pallets, lumber, carpet, furniture, drywall, toilets, windows, doors, lamps, sheetrock, mattresses, and asphalt shingles.

**Table 3.2.2-A: Park County Landfill Tonnage***

| Month | County Charged Weight (1) | Weight Covered in Refuse Assessment (2) | City Weight (3) | Roll – Off Weight (4) | Total Weight Received |
|---|---|---|---|---|---|
| **July** | 125 | 66 | 65 | 116 | 372 |
| **August** | 136 | 72 | 168 | 145 | 521 |
| **Sept.** | 95 | 68 | 128 | 59 | 351 |
| **October** | 78 | 53 | 135 | 99 | 365 |
| **November** | 81 | 34 | 130 | 91 | 336 |

## Table 3.2.2-A: Park County Landfill Tonnage (cont.)

| Month | County Charged Weight (1) | Weight Covered in Refuse Assessment (2) | City Weight (3) | Roll – Off Weight (4) | Total Weight Received |
|---|---|---|---|---|---|
| **December** | 66 | 24 | 78 | 57 | 225 |
| **January** | 99 | 40 | 107 | 71 | 317 |
| **February** | 103 | 54 | 122 | 56 | 335 |
| **March** | 225 | 47 | 143 | 89 | 503 |
| **April** | 134 | 108 | 145 | 128 | 514 |
| **May** | 193 | 92 | 319 | 141 | 745 |
| **June** | 187 | 120 | 250 | 147 | 704 |
| **Yearly Total – Tons** | **1,522** | **776** | **1,790** | **1,200** | **5,288** |

* Period: July, 2005 – June, 2006

NOTES

(1) County Charged Weight – Waste brought in by contactors working in the County and County residents. Contractors are charged a rate of $75 per ton. County residents are charged a rate of $45 per ton.

(2) Covered in Refuse Assessment – Waste brought in by County residents is covered under annual household solid waste assessment.

(3**)** City – Waste brought in by City residents and contractors working within the City limits are charged a rate of $75 per ton.

(4) Roll–off Weight – Roll – offs received from Green Box Sites and the Transfer Station. There is no charge for the roll – offs as this weight is covered in the yearly refuse assessment.

### 3.2.3 Transfer Station

The Transfer Station operated by the County receives municipal solid waste from the County's Green Box Sites and the City's refuse collection operation. Garbage is unloaded inside the Transfer Station, compacted into bottles, and then transported to the adjacent rail yard to be loaded on to rail car. Bottles are then loaded on the rail cars to the Valley View Landfill near East Helena in Jefferson County. The compactor at the Transfer Station has a six cubic yard hopper and was purchased for approximately $35,000. There is also a compactor at the Cooke City convenience center with a four cubic yard hopper that was purchased for approximately $25,000.

Immediately adjacent to the area inside the Transfer Station where garbage is unloaded is a small downstroke baler used for baling recovered cardboard. Automobile batteries, anti – freeze, and motor oil are accepted at the Transfer Station for reuse / recycling. Recycling bins from Headwaters Cooperative Recycling for newspaper, glass containers, aluminum cans, and tin cans are situated near the entrance to the Transfer Station. There is also a roll – off container available to the public for disposal of larger bulky items.

**Table 3.2.3-A: Transfer Station Tonnage**
**July, 2005 – June, 2006**

| Month | County Weight (1) | Cooke City Weight | City Weight (2) | Total Shipped Weight |
|---|---|---|---|---|
| July | 609.29 | 38.52 | 507.33 | 1,155.14 |
| August | 577.16 | 29.16 | 520.06 | 1,126.38 |
| September | 498.93 | 31.67 | 468.09 | 998.69 |
| October | 489.54 | 8.50 | 418.36 | 916.40 |
| November | 422.29 | 8.12 | 438.31 | 868.72 |
| December | 418.47 | 15.65 | 419.35 | 853.47 |
| January | 384.28 | 17.55 | 418.14 | 819.97 |
| February | 327.60 | 8.57 | 349.40 | 685.57 |
| March | 387.67 | 16.27 | 439.64 | 843.58 |
| April | 410.29 | 8.66 | 434.94 | 853.89 |
| May | 495.96 | 17.96 | 525.98 | 1,039.90 |
| June | 570.67 | 29.91 | 526.89 | 1,127.47 |
| **Total Tons** | **5,592.15** | **230.54** | **5,466.49** | **11,289.18** |

NOTES

(1) County Weight excludes Cooke City Weight. Cooke City Weight is for compacted container loads only. Roll – off loads go directly to the landfill, are weighed there, and reflected in the landfill tonnage. For the Transfer Station tonnage, Cooke City Weight + County Weight = Total County Weight.

(2) City figures for July to October, 2005 are from the City's Public Works Department. During this period of time the City transported its own trash directly to Logan Landfill near Bozeman operated by Gallatin County. For purposes of this Plan, and to portray data for a 12 – month period, it has been assumed this tonnage would have been taken to the Transfer Station.

### 3.2.4 Refuse Transport and Disposal

There are 21 specially designed containers (bottles) for refuse to be transported by railroad to the privately operated Valley View Landfill in Jefferson County. The containers hold approximately 10 to 12 tons of compacted trash. Fifteen were purchased by the County at a cost of about $11,200 each while six were provided by Envirocon, Inc., the rail haul / disposal contractor. Containers are shipped by rail five days per week. Five containers fit on one rail car.

### 3.2.5 Recycling

An area has been set aside at the Landfill for recovery of scrap metals including appliances. A contractor (AP&R, LLC from Butte) typically comes to the Landfill usually twice per year to remove the material for recycling (see Section 4.3). A small number of Green Box Sites such as Clyde Park and Wilsall, along with the Transfer Station, have recycling bins for newspaper, glass containers, aluminum and tin cans provided and serviced by Headwaters Cooperative Recycling. A small amount of cardboard is also recycled from County sources (see Section 4.3).

## 3.3 Additional Joint City / County Solid Waste Activities and Arrangements

Livingston and the County are cooperating in the disposal of municipal solid waste through the use of the Transfer Station and the rail haul / disposal services of Envirocon.

### 3.3.1 Refuse District #1

Park County Refuse District # 1 is the solid waste management organizational unit for residents, businesses, and institutions in the County unincorporated areas (including Clyde Park) outside the City limits of Livingston. There was an Advisory Board for

Refuse District # 1 that communicated with the Board of County Commission and County staff on solid waste topics specific to the County only. As of the publication of this solid waste plan this Advisory Board has been dissolved and no longer in existence. The activities of this board are handled by the Board of County Commissioners.

On the annual property tax bill there is a separate fee for the solid waste operations that serve residents, businesses, and institutions in the County unincorporated areas of Refuse District # 1. The Montana Department of Revenue Assessor's Office sends out tax bills October 31st which include the refuse assessment fee. The fee is for the following year. For example, the tax bill sent out on October 31, 2006 would have the full refuse assessment fee for calendar year 2007. The Park County Treasurer then receives payment for the tax bills and refuse fee. The current fee is set at $185 / year for one household or the equivalent of $ 15.42 / month. The components of the refuse assessment fee are:

- Transfer Station: $ 78
- Collection: $ 65
- Landfill: $ 42

Total: $ 185

Park County Refuse District #1 members receive two tags per year (per billed household) for display in vehicles. This allows access to the Green Box Sites, the Transfer Station, and the Landfill. The tags cover all household waste. The tags also cover 1 ton of non – household waste for disposal at either the Landfill or Green Box Sites. After a member has reached the 1 ton limit on non – household waste they will be charged $45 per ton thereafter with a $5 minimum charge. Extra tags are available for $ 10 each. District members are not charged for scrap metals (including appliances drained of Freon) and yard waste (such as grass, leaves, branches, brush) that is brought to the Landfill.

Property owners pay the appropriate annual fee for the availability and utilization of solid waste services in Refuse District # 1 regardless of whether the services are actually used. There are several other fee categories based on the standard residential household annual refuse assessment fee of $ 185, as noted below:

- Any business will pay a minimum of 3 households.
- A building which includes both a business and a residential home will be charged a minimum of 4 households.
- Bar and Café in same building will be charged a minimum of 6 households.
- Cabins and / or summer homes will be charged 1 household.

- Motels / Hotels will be charged an amount equal to 1 household for every 5 units or rooms in the motel / hotel; for each additional 5 units or rooms 1 household will be charged. For example, a motel with 12 rooms will be charged a rate of $ 555.
- Fishing Accesses will be charged a rate equal to 1/2 household.
- Schools will be charged a rate of 1 household for any number of students up to 50 students, and for every 50 students thereafter schools will be charged a rate equal to 1/2 household for 5 or more students over an increment of 50 students, up to 50 students. For example a school with 50 to 99 students would be charged a fee of $ 277.50 and a school with 100 to 104 students would be charged a fee of $ 370.00.
- Home businesses will be charged a minimum of 2 households.
- Bed and Breakfasts will be charged 2 households.
- Churches will be charged only for the parsonage at a rate of 1 household.
- Mini – storage warehouses will be charged 1 household per location.
- All other businesses, such as department stores or grocery stores, or other organizations which produce a large amount of refuse, will be charged a fee based on the comparison of the volume and type of waste produced by the business or organization with a typical residential unit. The fee will be set through negotiation with the generator and observation of the quantities and kinds of refuse produced.

### 3.3.2 Interlocal Solid Waste Subcommittee

The incorporated Cities of Livingston and Clyde Park, along with Park County, have formed a joint Inter - local Solid Waste Subcommittee for the discussion and resolution of solid waste issues. The Subcommittee was considered a forum to discuss and resolve solid waste management issues in a joint and cooperative manner. This sub-committee was formed for a limited duration and is no longer active. The members of the Solid Waste Subcommittee were as follows:

City of Livingston: Steve Caldwell, City Commissioner; Vicki Blakeman, City Commissioner; Ed Meece, City Manager; and Clint Tinsley, City Director of Public Works

City of Clyde Park: Barbara Shandy, Councilperson

Park County: Dick Murphy, County Commissioner; Larry Lahren, County Commissioner; Tara DePuy, County Civil Attorney; and Bill Hurley, County Operations Director

In addition, a Recycling Subcommittee composed of public and private sector representatives was formed to examine ways of increasing recycling in the County.

### 3.3.3 Headwaters Cooperative Recycling

Headwaters Recycling Cooperative is a non – profit entity operating in numerous counties and cities throughout Idaho and Montana. Headwaters established local community recycling centers with bins for material storage and collects / transports materials to processing / marketing operations. Revenues from commodity sales plus service fees through contractual agreements with public entities pay for the set – up, maintenance, and operation of Headwaters recycling programs.

Headwaters has a contract with Park County that lasts until the end of June, 2007 for servicing seven locations, two in Livingston and five at County Green Box sites. Funding is in the amount of $ 18,950 (rounded) per year based on an annual charge of $1.20 per person for every resident in the County. Presently the County pays about $10,500 of the contract amount while the City pays about $8,500.

Estimated material quantities collected during calendar year 2005 for all Headwaters recycling drop – off locations in the County are 106 tons of newspaper and other mixed paper grades; 14 tons of mixed aluminum and tin – coated steel cans; and 116 tons of mixed color glass for a total of 236 tons. This means it is costing about $80.30 per ton to recycle through Headwaters.

Headwaters function in recycling is to provide storage bins for materials and collection / transport services that bring those materials to an intermediate sorting, processing, and brokering company. Headwaters does not have a facility with the equipment necessary for performing these operations.

# 4 Solid Waste Quantities and Characteristics

## 4.1 Overview

Conventional, everyday household and commercial trash (also referred to as municipal solid waste or MSW) is taken to the Transfer Station. Construction / demolition debris and larger, bulky items are disposed at the Park County Landfill. While both of these material streams contribute to the County's overall disposed waste, for purposes of discussion in this Solid Waste Plan they need to be viewed separately.

It is anticipated that materials presently being disposed at the landfill will continue to be handled in that manner, although some portion is potentially reusable or recyclable. The tonnage going through the Transfer Station that is being transported by rail to Valley View Landfill in Jefferson County could be subject to several other disposal options, including but not limited to:

- Direct haul without transfer to an in – County incinerator;
- Transfer and rail haul to another landfill (not Valley View) outside the County;
- Transfer and truck haul to another landfill outside the County or a new landfill inside the County;
- Transfer to another transfer station outside the County for subsequent shipment to a landfill; and,
- Continued transfer and rail haul or truck haul to Valley View Landfill as a result of new, long – term contractual arrangement.

Description, analysis, and evaluation of alternative solid waste management scenarios in Sections 8 and 9 of this Plan are based on each scenario handling the same waste stream – the MSW going to the Transfer Station. This common baseline is essential in order to derive per ton costs that are comparable.

Section 4.2 below summarizes the quantities of refuse currently being disposed from the City and County both through the Transfer Station and at the landfill. Section 4.3 quantifies existing diversion through recycling and composting conducted by the City and County based on the best available documentation. Section 4.4 portrays MSW disposed, diverted and generated on a countywide basis for the period 2005 through 2025 according to the population projections from Section 2.4 and other key assumptions noted in Section 4.4.

## 4.2 Current Disposal

The annual MSW tonnage handled through the Transfer Station is approximately 11,290 tons, as follows:

- County – 5,823 tons (52 %)
- City – 5,467 tons (48 %)

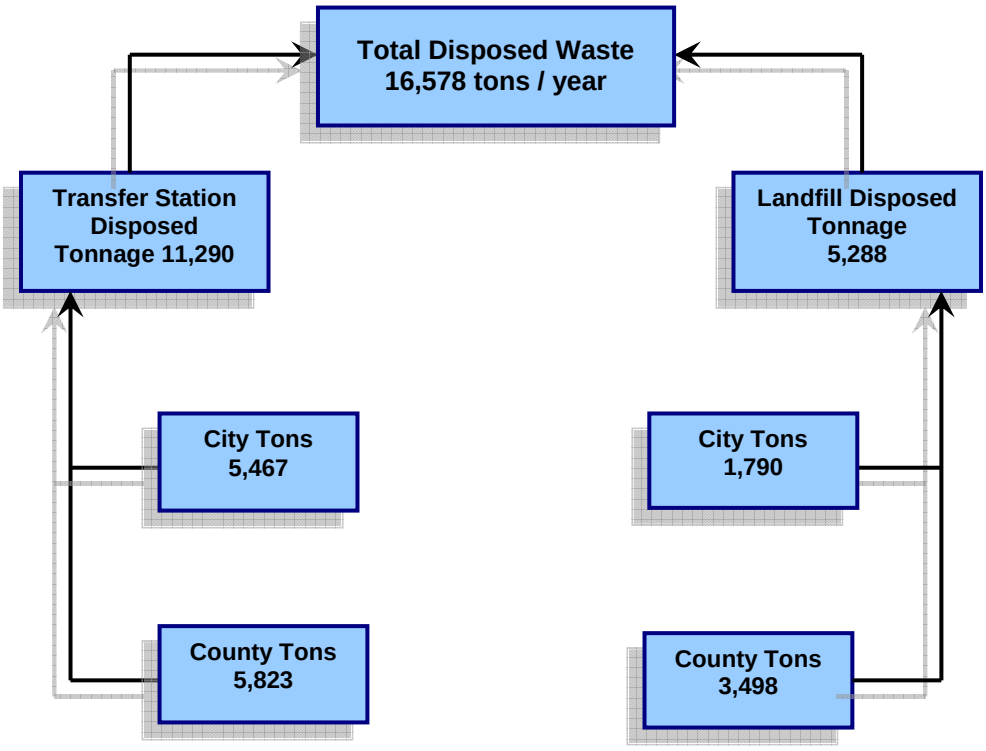
The annual tonnage disposed at the Park County Landfill is approximately 5,288 tons, as follows:

- County – 3,498 tons (66 %; includes County Charged Weight, Weight Covered in Refuse Assessment Charge, and Roll – off Weight)
- City – 1,790 tons (34 %)

Adding the Transfer Station and Landfill tonnage yields 16,578 tons disposed countywide. County sources account for 9,321 tons or 56 % while City sources account for 7,257 tons or 44 %.

Figure 4.2.1-A below portrays the disposed waste stream in Park County.

**Figure 4.2.1-A: Disposed Waste in Park County**



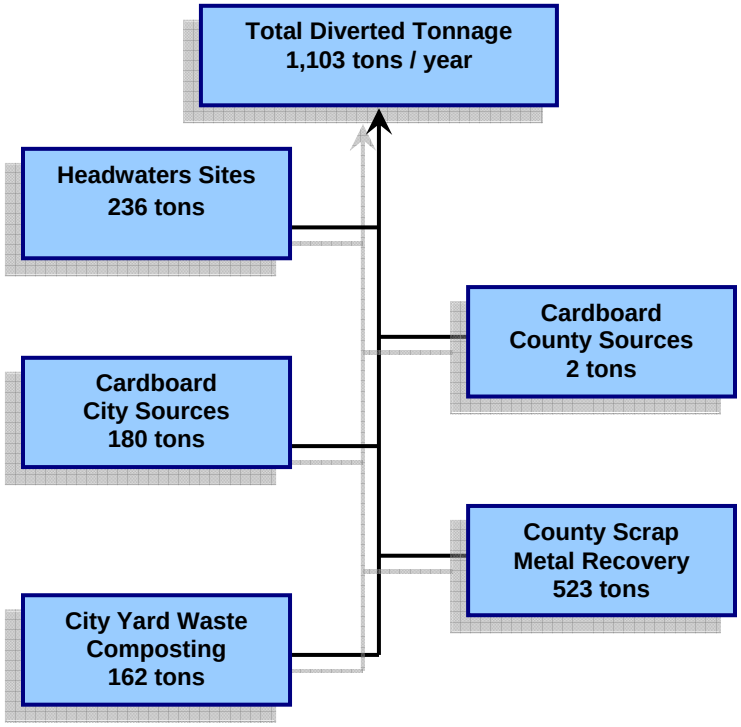
## 4.3 Current Diversion

- Headwaters drop – off centers: 236 tons per year (T/Y)
- Cardboard – County sources: 2 T/Y
- Cardboard – City sources: 180 T/Y (based on 15 tons per month average)
- Yard waste recovered for City composting operation: 162 T/Y
- County scrap metal recovery: 523 T/Y

**Total Annual Diverted Tonnage: 1,103 T/Y**

Figure 4.3-A portrays the diverted waste stream in Park County followed by the diversion rate calculations.

**Figure 4.3-A: Diverted Tonnage in Park County**



The diversion rate is calculated with the following formulas:

*Tons Disposed + Tons Diverted = Total Tons Generated*

*Tons Diverted ÷ Tons Generated X100 = Diversion Rate %*

Using the tons of MSW disposed from Section 4.2 in the formulas results in a current countywide diversion rate of about 9 %:

**Diversion Rate from Municipal Solid Waste Stream (MSW) in Park County**

**Transfer Station Tons Only**

Tons Disposed is 11,290 + Tons Diverted is 1,103 = Total Tons Generated is 12,393

Tons Diverted is 1,103 ÷ Tons Generated is 12,393 (x 100) = Diversion Rate of 9%

**Diversion Rate from Total Countywide Waste Stream – Transfer Station & Landfill Tons Combined**

Tons Disposed is 16,578 + Tons Diverted is 1,103 = Total Tons Generated is 17,681

Tons Diverted is 1,103 ÷ Tons Generated is 17,681 (x 100) = Diversion Rate of 6%

## 4.4 Projected Disposal, Recycling and Total Material Generation

To plan for future solid waste management programs, a waste stream projection is developed showing the quantities of materials disposed, diverted, and generated over a specified time period. Table 4.4-1 presents a waste stream projection for Park County using the following steps and assumptions:

- It is assumed each additional person generates 1 ton per year of waste.
- Starting with 2006, total waste generated is determined by multiplying 1 ton times the population increase for each year and adding that figure to the generated tonnage for the previous year.
- It is assumed the current diversion rate of 9 % remains stable from 2006 to 2008. Starting in 2009 it is assumed the diversion rate grows 1 % each year for six years, thus reaching 15 % by year 2014. It is assumed the 15 % diversion rate remains stable for the period 2015 through 2025. To achieve a 15 % diversion rate existing waste reduction, recycling, and composting efforts would be modified and / or expanded in the residential and commercial sectors of both the City and County.
- The diverted tonnage for each year is derived by multiplying the diversion rate times the generated tonnage.
- The disposed tonnage for each year is derived by subtracting the diverted tonnage from the generated tonnage.

## Table 4.4-1: Waste Disposal, Diversion & Generation Tonnage Projections for Park County, 2005 – 2025

| Year | Estimated Population in Park County | Disposed Tons | Diverted Tons | Diversion Rate % | Total Tons Generated |
|---|---|---|---|---|---|
| 2005 | 15,968 | 11,290 | 1,103 | 9 % | 12,393 |
| 2006 | 16,734 | 11,975 | 1,184 | 9% | 13,159 |
| 2007 | 17,538 | 12,706 | 1,257 | 9% | 13,963 |
| 2008 | 18,380 | 13,473 | 1,332 | 9% | 14,805 |
| 2009 | 19,262 | 14,118 | 1,569 | 10 % | 15,687 |
| 2010 | 19,551 | 14,219 | 1,757 | 11 % | 15,976 |
| 2011 | 19,844 | 14,317 | 1,952 | 12 % | 16,269 |
| 2012 | 20,142 | 14,413 | 2,154 | 13 % | 16,567 |
| 2013 | 20,444 | 14,507 | 2,362 | 14 % | 16,869 |
| 2014 | 20,750 | 14,599 | 2,576 | 15 % | 17,175 |
| 2015 | 21,062 | 14,864 | 2,623 | 15% | 17,487 |
| 2016 | 21,378 | 15,133 | 2,670 | 15% | 17,803 |
| 2017 | 21,698 | 15,405 | 2,718 | 15% | 18,123 |
| 2018 | 22,024 | 15,682 | 2,767 | 15% | 18,449 |
| 2019 | 22,354 | 15,962 | 2,817 | 15% | 18,779 |
| 2020 | 22,689 | 16,247 | 2,867 | 15% | 19,114 |
| 2021 | 23,030 | 16,537 | 2,918 | 15% | 19,455 |
| 2022 | 23,375 | 16,830 | 2,970 | 15% | 19,800 |
| 2023 | 23,726 | 17,128 | 3,023 | 15% | 20,151 |
| 2024 | 24,082 | 17,431 | 3,076 | 15% | 20,507 |
| 2025 | 24,443 | 17,738 | 3,130 | 15% | 20,868 |

# 5 Analysis of Existing Solid Waste Management Practices

At the present time Park County and the City of Livingston operate independently with regards to collection and disposal of solid waste. Since 2005, Park County has taken the initiative to enter into a contract with a private company to transport solid waste via rail cars to a landfill approximately 120 miles from Livingston. Park County currently owns and operates a transfer station in close proximity to the rail yard. Solid waste from both the city and county is transported to this transfer station where it is compacted and filled into specially designed steel rail haul containers (called ***"bottles"*** as depicted in the picture to the right).

The City operates its own fleet of collection vehicles and provides curbside collection services for MSW for the City residents and businesses. The City reimburses the County for transfer station operations, rail transportation and disposal costs based on an agreed upon tipping fee per ton between the two entities. MSW from convenience centers (called ***"green box"*** sites) is transported by the County to the transfer station. MSW from both the City and County is combined at the transfer station, compacted and loaded in bottles which are placed on open rail cars for transportation to the landfill. Currently, the only interface between the City and County with regards to MSW management is the handling of City's MSW at the transfer station, transportation and disposal by a private contractor, contracted by the County.

## 5.1 Jurisdictional and Organizational Analysis

Population of the entire Park County in 2005 was reported to be fewer than 16,000. This total County population includes approximately 7,000 in Livingston and the remaining approximately 9,000 in the unincorporated areas of the County. Population in the entire Park County, including Livingston, is projected to reach approximately 41,000 in 2025 (the solid waste management planning period). Thus, the following facts must be considered in analyzing jurisdictional and organizational issues:

- Total population of the planning area is relatively small and through the planning horizon of 20 years, it will still remain a small semi-urban community

- The population is almost equally divided between the City of Livingston and unincorporated areas of Park County.
- Approximately 25% of the County population resides in areas contiguous to and within the extra territorial boundary of Livingston

The above factors point to the need of integrating solid waste management for both Livingston and Park County into a homogeneous system to maximize the benefits that can be derived from economies of scale. As discussed in the following sub-sections, many jurisdictional issues presently place constraints on instituting such a homogeneous system.

### 5.1.1 Jurisdictional Analysis

As the areas within Livingston develop and get populated along the fringes of the municipal limits and at the same time areas within the County surrounding the municipal boundaries develop rapidly, the jurisdictional limitations become more evident. One such area where growth from the City and County coincides is known as “Donut”. Ironically, within this area, residences on one side of the street fall within the County and the other side of the street fall within Livingston. MSW is collected at curbside by the City of Livingston on the municipal side of the street, while residents on the county side must haul their solid wastes to a nearby green box site. This is an example of the current jurisdictional split between the City and County that restricts providing compatible level of service for residents of a neighborhood that straddles the municipal boundary of Livingston.

As growth has occurred along fringes of the municipal boundaries of the City of Livingston, the City limits have grown from annexation. Residents of the County adjoining the municipal limits have for years accepted vast differences in the level of service due to the “fear” of being annexed by Livingston. This fear of annexation in the minds of the County residents creates a jurisdictional divide between the City and County.

There has been an attempt to collaborate the solid waste management within the City and County as reflected by the formation of the Joint Inter-Local Solid Waste Sub-committee. However, this inter local sub-committee was formed with limited charter and for a limited duration, which has now expired. Thus, this sub-committee is currently dormant. Due to jurisdictional constraints, the City and County continues to make independent decisions regarding solid waste management within their respective jurisdictions. This restricts full and efficient use of the assets and resources under control of the two entities. The jurisdictional gap widens by the deliberations of such groups as Park County Refuse District No.1 Advisory Board, which appeared to favor the County making solid waste management decisions independently, without regard to

the City's solid waste disposal needs. However, this advisory board has been dissolved as of the date of publication of this plan.

Organizational issues have also impacted solid waste management decision making process in the past. According to the State of Montana Charter, the City of Livingston is governed by City commissioners elected at large within the City and this body is the legislative arm of the City making policy decisions in the best interest of public welfare. The day to day operation of the City is under the control of the City Manager who is charged with implementing the policies promulgated by the City commission. Park County on the other hand, is governed by three elected County commissioners and does not have an administrative head, such as a County Manager. Personnel policies and charters of the two entities are also different, which makes it difficult for the two entities to share human resources.

The jurisdictional and organizational issues discussed above have restricted the City of Livingston and Park County to efficiently utilize its resources and use economies of scale from consolidating solid waste collection, transfer and disposal as well as explore recycling opportunities fully.

## 5.2 Operational Analysis

### 5.2.1 Solid Waste Collection Within Livingston Municipal Limits

The City of Livingston provides curbside and alley way collection of MSW within the municipal boundary of the City. Commercial solid waste from businesses within the municipal limits is also collected by the City. Many of the older areas of the City have narrow alleys behind residences. The City uses automated collection vehicles to pick up solid waste from both sides of the alley. The collection vehicles traverse each alley twice (in either direction) to facilitate collection from both sides of the alley. The City of Livingston also provides curbside pick-up of recycled cardboard from commercial establishments, and green waste pick-up during the spring and summer months.

MSW is transferred to the Transfer Station operated by the County. For sometime recycled cardboard was also transported to the transfer station for bailing and recycling. However, more recently the County stopped accepting recycled cardboard from the City, since there is inadequate space and inefficient handling and bailing facilities currently available at the transfer station. This situation has forced the City to haul its recycled cardboard to Bozeman, Montana.

Due to enhanced tourism during the summer months, Livingston and Park County experience a surge in solid waste quantities during these months. The County currently has a total of 21 bottles available for transporting compacted solid waste to the landfill. These number of bottles are sufficient to handle the solid waste transported during

winter, spring and fall months, but inadequate to handle the surge in solid waste quantities during the summer months. Current arrangements between the City and County would require the City to transport excess MSW (solid waste beyond the capacity of transporting in the available 21 bottles) to the Logan landfill during the summer months. Fortunately this summer (2006), the City's entire MSW has been handled by the County at the transfer station and transported in the available bottles to the disposal site via railroad. The County's operational staff has used extra ordinary care and bottle management techniques to achieve this efficiency. This efficiency is commendable, considering the limited resources currently available at the transfer station. However, if a sudden surge in solid waste quantities is experienced, the City may have to transport its solid waste overflow to Logan. The jurisdictional and organizational constraints thus far, restrict the City and/or the County to consolidate its financial resources and acquire additional bottles and improve upon this inefficient mode of MSW disposal. These limitations cause the uncertainty faced by the City with regards to hauling excess MSW by truck to Logan.

As indicated above, the City's collection vehicles traverse many areas bordering the County and provide curbside collection of MSW exclusively on the municipal side of the street. Once again, current jurisdictional limitations do not allow the City to provide curbside service to residents on the County side of the street.

### 5.2.2 Solid Waste Collection Within Park County

Currently Park County does not provide curbside pick-up of solid waste anywhere within Park County. Also, no solid waste pick-up services are provided to commercial establishments within the County. Currently all residents and businesses within the County are required to transport their respective MSW to one of the seventeen (17) convenience stations (***Called Green Box Sites)*** located throughout the County.

Access to the County's Green Box sites is virtually unlimited and unrestricted, since the sites are supervised part – time by employees who move from one location to another. Some sites have roll – off containers for large, bulky items and construction / demolition debris while others do not. However, it is not unusual for such material to be placed in the smaller dumpsters designated for MSW. These MSW dumpsters are emptied into a front – loading refuse vehicle for transport back to the Transfer Station. It is at the Transfer Station where the problems of mixed waste (large bulky items and construction debris mixed with MSW in

Green boxes) become pronounced. When the truck unloads at the Transfer Station the large, bulky items, construction and demolition debris must be manually removed from the MSW because these large bulky components of the waste stream cannot be compacted into the rail haul bottles.

At the Transfer Station the large bulky un-compactable items (that were manually segregated) are once again loaded in trucks for transportation to the Park County Landfill. In spite of diligent efforts by the Transfer Station staff to segregate the large bulky items from MSW, some smaller non-compactable items remain in the solid waste stream that goes through the compactor and loaded into the bottles. The presence of these large items inhibits full compaction and optimum loading of bottles. Ultimately, all of these problems translate into inefficient use of bottles jeopardizing management of solid waste transportation to disposal site via railroad.

From an operational and financial point of view there are several issues with respect to the green box sites:

- There are too many sites scattered throughout the County creating a very difficult management situation
- Due to the number of sites and relatively long hours of operation it is not economically feasible to have an attendant at each site during operating hours
- To provide convenience to residents many green box locations provide 24-hour walk-in access for residents to deposit MSW. This situation virtually removes all controls on the type and method used for the public to deposit their MSW and invariably leads to abuse of the facilities.
- Some green box locations have a roll-off for depositing large items and construction and demolition debris. This does help in segregating large items from MSW. However, even at these locations (in the absence of an attendant) abuse of facilities is evident and large items continue to be deposited in MSW receptacles.
- Recycling receptacles have been provided at each of the green box locations but, very limited MSW appears to be currently diverted to recycling.
- Each household in the County is currently charged $185 solid waste fee annually irrespective of the location of the household in the County. This annual fee covers use of the landfill by county residents for disposal of yard wastes and construction/demolition debris. The Park County landfill is several miles from many rural communities making it inconvenient for residents of these communities to haul their wastes (other than MSW) to this landfill. Thus, disposing construction and demolition debris at green box sites is

convenient and free for the county residents, all of which gives rise to more abuse of the green box sites.

- Currently businesses must pay based on the per household annual fee formula used by Park County. This situation is seen as "business unfriendly" and considered an inequitable approach by the businesses of Park County.

- The Cooke City green box location has an attendant on duty during operating hours and is well maintained. The Cooke City green box location consists of a compactor which is used to compact the MSW and loaded in bottles. Thus, MSW from Cooke City does not have to be re-handled at the transfer station. Cooke City also has a roll-off for depositing large items and for construction/demolition debris. Here the roll-off is efficiently utilized, since the attendant directs the residents to properly dispose solid waste in the appropriate container. Transportation of solid waste from Cooke City requires about 4 to 6 hours round trip depending upon weather conditions. During inclement weather roads through Yellowstone National Park are closed and solid waste cannot be transported from Cooke City. If this situation persists for several days, solid waste must accumulate at the green box location which is of serious public health concern to Park County.

### 5.2.3 Transfer Station

The Transfer Station is located in the vicinity of the municipal limits of Livingston and is adjacent to the Montana Rail Road yard. The Transfer Station is operated by Park County staff. The City of Livingston collection vehicles bring MSW to the Transfer Station and drop it on the tipping floor. The City and County have entered into an agreement that allows the County to operate the Transfer Station and transfer solid waste on rail cars for disposal into the Valley View landfill (about 120 miles from Livingston). The City is charged a tipping fee of $55/Ton by the County for this service. The County must cover its costs related to operation of the transfer station and contractual obligations to Envirocon within this $55/Ton tipping fee. MSW from all green box sites (except from Cooke City) is also dropped of on the tipping floor and combined with the City's MSW.

The area for off – loading trash inside the Transfer Station is small and confined. In addition to the handling of MSW on the tipping floor of the Transfer Station, recycled cardboard is also dropped off on the tipping floor where it is bailed using a small bailer. The Transfer Station staff must rapidly remove large items and non-compactable debris from the MSW being transported from green box locations and push the MSW into the compactor for loading into the bottles. The effect of these operating conditions is to create operational delays and inefficiencies that slow down the movement of waste in and out of the Transfer Station. At the end inefficiencies translate to added cost of handling MSW.

Full bottles are queued in the Transfer Station parking lot for transportation to the nearby rail yard and for loading the bottles on open flat bed rail cars. Loading of bottles on rail cars is a precise operation and requires experience and skills. Several members of the County Transfer Station staff are well trained to skillfully load the bottles on the rail cars. Operation of the Transfer Station related to loading of full bottles and unloading of empty bottles from rail cars appears to be handled efficiently by the County staff.

### 5.2.4 Composting

The City is currently composting yard wastes in the vicinity of the City's wastewater treatment facility. This operation is independently operated and managed by the City with no participation from the County. The City does accept yard wastes at this facility irrespective of the residency (County or City) of the person bringing the material. At the same time yard wastes are also accepted at Park County landfill and disposed of together with construction/demolition debris into the landfill. At present bio-solids (sludge) from the wastewater treatment plant are not incorporated into the composting of yard wastes. Again, this operation currently is within the control of the City and due to jurisdictional constraints there is no participation by the County.

## 5.3 Waste Reduction / Recycling Analysis

Park County and the City of Livingston are publicly committed to waste reduction / recycling (WRR) and conduct several recycling activities as described in Sections 3.1.3, 3.1.4, and 3.2.5. The broad composition of the Recycling Subcommittee demonstrates interest in WRR by citizens, businesses, and organizations. However, expansion of recycling faces a number of institutional and operational challenges in the County, including but not limited to the following:

- Lack of recognized program identity and leadership.
- No ongoing, consistent, coordinated education / promotion / outreach.
- Lack of closer cooperation and integration of efforts between the City and County.
- Small population and commercial base that does not generate significant quantities of recyclable materials.
- One small baler located inside the Transfer Station with resulting inherent limitations on the amount of material that can be baled and not disrupt refuse unloading and compaction.
- Limited storage space available for cardboard bales or other recyclable materials. On a broader level, lack of a dedicated area / building (fully or partially enclosed) for the aggregation and storage of recyclables prior to processing / marketing.
- Other than the baler for cardboard at the Transfer Station, there is no private or public sector recyclables processing / marketing capability in the County.
- Distance from intermediate (processing) or end – use (manufacturing) markets (the closest processors are in Bozeman).

Headwaters Cooperative Recycling in its present form does not have the resources to address the challenges noted above by providing a wider range of services to the City and County. To do so will likely require the City and County to consider development of a building / operation physically separate from the Transfer Station for handling and stockpiling recyclables. This facility would also serve as a central Recycling Center for residents and businesses. The City / County could engage in a formal partnership with a private sector processor to periodically collect and market the aggregated materials. A model of this kind of arrangement is already in place regarding the recovery and removal of scrap metals from the landfill.

In addition, special emphasis on waste reduction may be appropriate because this does not require infrastructure investments, materials handling, or specialized marketing contacts and expertise. Implementation of waste reduction techniques and information can be largely accomplished through local promotion, education, and outreach efforts using existing community groups, communication channels, and media outlets.

## 5.4 Financial Analysis

A synopsis of the current financial status of solid waste collection, handling and disposal for the City and County is provided in the following sub-sections.

### 5.4.1 City of Livingston Financial Analysis

The City of Livingston provides curbside collection of MSW from households and businesses within the municipal limits. The City's collection vehicles drop-off solid waste on the tipping floor of the Transfer Station owned and operated by the County. The City pays $55/Ton for handling, transportation to disposal site and disposal (via Envirocon contract) to the County. The City also picks up cardboard for recycling from commercial establishments within the municipal limits. For some time cardboard was taken to the Transfer Station for bailing and sale to recyclers in Bozeman. However, more recently the City has been taking unbailed cardboard to a recycler in Bozeman in the City's trucks.

The City's solid waste operations are operated as an "Enterprise Fund" and revenues generated from solid waste collection fees from residential and commercial establishments are the sole source of funding the enterprise. No general funds are utilized to subsidize solid waste operations by the City. The City currently charges residential customers a fee of $13.62/Month for one 96 – gallon cart. For commercial solid waste collection the City charges by weight and frequency of collection. Currently the City is charging $131/Ton for the first ton and an additional $131/Ton for every ton thereafter. At the present time the City is incurring a cost of $143/Ton for collection and recycling and an additional cost of $55/Ton for handling and disposal that it pays to the County. Thus the total solid waste disposal cost currently incurred by the City is about $198/Ton.

### 5.4.2 Park County Financial Analysis

Currently the County collects $185 per household for residential solid waste services provided to County residents. Commercial customers are assessed charge based on number of household equivalent for the business. Commercial rates do not appear to be equitable, since businesses are not charged based on weight of solid waste produced instead it is arbitrarily assigned a household equivalent value. Additionally, residents and businesses within the County are not provided curbside solid waste pick-up. Residents and businesses must haul their solid waste to the nearest green box location for drop-off.

The cost per ton of solid waste collection from green box sites was estimated based on solid waste expenditures recorded by the County for operation and maintenance of the green box sites and hauling of the solid waste to the Transfer Station. It is estimated that these operations are currently costing approximately $55/Ton.

The operation of the Transfer Station is currently costing the County approximately $32.50/Ton. Transportation and disposal to the out of the Park County Landfill via rail haul (Envirocon Contract) is currently costing approximately $37/Ton. Thus the total solid waste collection and disposal cost currently incurred by the County is approximately $124.50/Ton.

The County is also operating the Class II landfill. The operating cost of this landfill is estimated to be about $102/Ton. Approximately $ 34/Ton of this cost is set aside for closure and post closure costs of the landfill as mandated by the federal and state regulations. The County charges $75/Ton tipping fee from contractors at the landfill and $45/Ton from County residents. City residents are charged $75/Ton. Thus, the landfill operations are currently subsidized by the solid waste fee charged annually by the County to the residents and businesses.

## 5.5 Findings and Conclusions – System Needs, Challenges and Opportunities

In reviewing system needs, some opportunities for improving efficiency become evident. Restructuring and consolidation of certain operations between the City and County can improve efficiency of the operations and achieve savings in operating costs. Following are some examples of such opportunities for consolidation and restructuring of operations between the City and County:

- The City should be contracted to provide solid waste collection services to County residents in the vicinity of municipal boundaries of Livingston. By increasing the tonnage collected with minimal (if any) additional cost incurred by the City, the cost of collection per ton can be substantially reduced from its current $143/Ton.
- At the present time the City collection vehicles collect solid waste from both sides of the alleys. The City should consider collection on just one side of the alley which will minimize the collection time and improve cost of collection per ton. Such a change would have minimal impact on the level of service currently afforded to the residents and cause least inconvenience.
- If the City were to provide curbside pick-up of solid waste to County residents in the vicinity of the municipal boundaries, the County may be able to minimize green box locations. This would result in lower operating costs of the green box sites.
- The County should consider making some capital expenditure to improve green box sites. These improvements should include: improved segregation of MSW and construction/demolition debris at the green box sites and compaction of MSW into the bottles at the green box sites (similar to Cooke City). Minimizing the number of green box sites, improving the design of the green box sites, restricting 24-hour access to the sites and manning the sites during operating hours can significantly improve operations at the Transfer Station and reduce Transfer Station operating costs.

- The City and County should consider a joint recycling center for improved collection, sorting, packaging and bailing for transportation to recycled product markets.
- Composting operations by the City should be moved to the landfill site and yard wastes (green) dropped off at the landfill should be directed to the composting operations. This will help divert more green wastes to composting and achieve waste reduction goals.

# 6 Guiding Principles in Formulating Solid Waste Management Plan

The City of Livingston and Park County are two independent local government entities, each having certain charters under the State of Montana Law. From the stand point of revenue generation, method of governance, personnel policies and available resources the two entities must function independently. The elected bodies of each entity (the City Commission of the City of Livingston; the Board of County Commissioners of Park County) have certain accountability toward its respective constituents. One of the primary accountability issues involves capital expenditure and setting of rates for local government services. Thus, in creating a workable solid waste management plan, one faces the following dilemma:

- The plan must consider jurisdictional limitations and accountability of the respective elected bodies toward its constituents
- The City of Livingston and Park County combined is projected to produce approximately 18,000 tons of solid waste annually (about 75 tons/day) at the end of the planning period (2025) a rather small quantity, as compared to other metropolitan areas. At these MSW generation rates it is vital to consolidate resources and assets of both the City and County to optimize on economy of scale. The cost of creation of any infrastructure for solid waste handling and disposal will be prohibitive, if the two entities were to act independently
- The level of service currently provided independently by the City and County should be retained as long as it is economically and technically feasible.

Based on the above constraints a set of guiding principles for development of the solid waste management plan were identified. These guiding principles are described in the following sub-sections:

## 6.1 Coordination

The solid waste management plan can only succeed if there is full and complete spirit of cooperation between the elected bodies of the City of Livingston and Park County. Each entity must recognize that some accommodations will be necessary for the implementation and execution of the plan and for it to ultimately succeed. The mode of operations and practices that existed in the past may have to be modified. There needs to be recognition that initially the staff and public will resist any change that is implemented. The elected bodies will have to stay firm and continue promoting the merits of the changes that the plan will recommend. Ultimately, coordination between the two entities will filter down to the public and as the merits of the plan start to become evident, cooperative sprit will emerge.

## 6.2 Local Control

The plan must be designed to retain control by the governing boards of the two entities regarding setting of policy, capital expenditure and rates for the MSW services. The residents of the City of Livingston and Park County are going to look toward their respective elected representatives to make such vital community services decisions. Joint governance of solid waste management should be under the direction of a body that has equitable and fair representation from both the City Commission and the Board of County Commissioners. Any advisory boards, or committees, that are formulated for the purpose of reviewing, over seeing and advising on solid waste management issues, should also have equitable and fair representation from residents of the City and the County.

## 6.3 Efficiency

The plan must efficiently utilize all assets and resources already available within the City and the County. Following are elements of maximizing efficiency:

- Use all existing resources and assets to the greatest extent possible – this may include changing past operating scenarios and methods
- Maximize the use of available human resources and their respective skills and experience
- Make operational changes where necessary to maximize efficiency which will result in the most value for each dollar spent.
- Integrate operations where necessary in a manner that provides improved level of service to residents of both the City and the County.

## 6.4 Reliability

The plan must seek methods and processes that will reliably solve the solid waste collection, handling and disposal problems for the planning horizon of 20 years. In certain situations the plan may choose a new, or change an existing operation, commensurate with the desired level of service, to improve the long term reliability of solid waste management in Livingston/Park County.

## 6.5 Flexibility

The plan must select processes, methods and management structure that provide a prudent degree of flexibility. Flexibility will provide resilience in the plan so that it can be molded to comply with changing environmental, demographic, economic and regulatory conditions during the planning period.

## 6.6 Regulatory Consistency and Stability

Inconsistency and instability in state and federal regulations can have significant impacts on the success of the solid waste plan. Frequent changes in federal and state regulations impact the local government operations relative to solid waste management. Typically, some aspects of regulations are more prone to change than others. A technologically advanced system with limited operating history will most likely be more impacted by changes in regulations. As an example, incineration of solid waste that impacts ambient air quality is more prone to changes in regulations than landfills. Again, landfills in areas where groundwater tables are shallow and in the vicinity of drinking water aquifers, may be more prone to regulatory impacts.

## 6.7 Fairness in Cost Sharing

As discussed in Section 6.1 above, coordination between the two entities is of utmost importance. This coordination would yield open discussion of all cost sharing issues and equitable resolution of cost sharing between the two entities. Fairness in cost sharing is the back bone of good cooperation. A cooperative spirit will cease to exist if there is a perception of unfairness in cost sharing by the public.

## 6.8 Support Waste Reduction / Recycling

The plan must provide for adequate incentive for waste reduction and recycling. Any process or operation that penalizes waste reduction/recycling should be avoided. The level of service afforded to the public to deposit recycled materials should be at least as convenient as that afforded for solid waste collection. More convenience afforded to the public for collecting and depositing the recyclables can provide added incentive for recycling and will improve the quantity of MSW diverted from disposal.

## 6.9 Public Awareness and Education

Public awareness and education is an integral part of a successful plan. Effort should be made throughout the planning period to educate the public on such issues as:

- Regulatory changes that impact solid waste handling and disposal
- Problems caused in handling and segregating MSW from construction and demolition debris – impact on the cost of operations that affects rate payers
- Recycling and waste reduction training and awareness
- Level of service provided under the plan to provide for an efficient operation
- Mixing hazardous and toxic wastes with MSW – its impact on the environment

## 6.10 Addressing Local Needs is Paramount

The plan must provide an economic and technical baseline. This baseline should strictly follow local requirements and based on quantity of solid waste generated within Park County. Considerations related to Solid waste from other jurisdictions (outside Park County), for possibly improving economic viability, should be incidental to the planning process and not be included in formulating the plan.

# 7 Solid Waste Collection, Handling and Transfer

## 7.1 Refuse Collection

### 7.1.1 Extension of City Service to Certain Unincorporated Areas

Residential housing is being constructed on lands at the edge of the current City limits and on property immediately adjacent to the City that is in County unincorporated areas. These developments are in the same neighborhoods even though the jurisdictions are different. It is literally the case that a house on one side of a street may receive City refuse collection service while a house on the other side takes their waste to a County Green Box Site. From a practical and operational perspective this makes little sense. The City and County may want to consider extending City refuse collection service to more developed portions of the County unincorporated areas within a designated distance from the City jurisdictional boundary. If City collection services are extended beyond the municipal boundaries of the City of Livingston, the following benefits will occur:

- County residents living in the vicinity of the municipal boundary sharing the same ambience and neighborhoods as their counterparts in the City, will receive an improved level of solid waste collection service
- City's collection cost per ton will reduce, since more tonnage will be collected on the same route as before with no additions in personnel or infrastructure cost
- The County may be able to phase out some of its seventeen (17) green box locations and realize savings in operations cost

### 7.1.2 Modification of Services at County Green Box Sites

There are several different ways of modifying the County Green Box convenience centers including:

- Increasing the number of sites;
- Decreasing the number of sites;
- Eliminating the use of dumpsters and using only roll – off containers, but designating some roll – offs for regular trash and others for large, bulky items and construction / demolition (C & D) debris;
- Placing rail – haul containers with compaction units at some or all sites;
- Limiting site access to certain days and hours;
- Staffing sites during operating hours

The operating and servicing methods at the seventeen (17) Green Box Sites are time consuming and costly. In addition, off – loading commingled MSW with bulky items, and construction/demolition debris, from green box sites, creates operational inefficiencies and logistical problems at the Transfer Station. Serious consideration is warranted to seek alternatives for operating the Green Box sites and with regards to the configuration and locations throughout the County.

Furthermore, the City and County could consider measures to more formally control the flow and management of construction / demolition debris through an ordinance that would:

- Prohibit C & D contractors from using County Green Box locations for disposal of the debris;
- Direct C & D contractors to deposit debris in designated containers at the Transfer Station;
- Direct C & D contractors to use the Park County Landfill for in–County disposal of C & D debris;
- Require designated construction/demolition projects to recover for reuse or recycling specified materials and/or a minimum volume or weight of the materials generated by the project; and/or,
- Set fines/penalties for not complying with the provisions of the ordinance(s).

## 7.2 Refuse Handling and Transport

Solid waste is collected at curbside (by the City within municipal limits) and at the Green Box locations (by the County).

Under the present operating mode, whereby solid waste is compacted and filled in bottles for rail haul, a Transfer Station is necessary. Depending upon the disposal option ultimately selected for long term solid waste management from Livingston and Park County, the existing Transfer Station may need to be modified. Several scenarios for Transfer Station expansion/modifications are discussed in the following sub-sections.

### 7.2.1 Maintain Present Transfer Station with no Expansion

If arrangements can be made for a long term rail haul to an out - of – county landfill the present status of Transfer Station can be maintained indefinitely with periodic maintenance of grounds, buildings and equipment. This will only be possible if handling and bailing of cardboard is moved to a different location, such as a recycling center that is conveniently located within Livingston. Under this scenario additional bottles may

have to be acquired for reliable queuing of outgoing and incoming bottles as solid waste quantities increase during the planning period. The service life of existing Transfer Station can be enhanced if some or, all of the green box sites are upgraded to include compaction and bottle filling similar to Cooke City operations. Compaction on site is the most cost effective scenario for refuse handling, since it will not require an immediate significant capital outlay for redesign and re-construction of the facilities.

### 7.2.2 Expand Transfer Station

If any of the following options are finally selected for solid waste disposal, the Transfer Station will need to be redesigned, re-configured and expanded:

- Truck Haul to out – of - county landfill
- Truck hall to in-county landfill
- Incineration of solid waste

Under the first two scenarios (truck haul to in-county or out – of - county landfill) the Transfer Station will have to be re-configured where the transport trucks are located at a lower level below the operating floor level. This configuration will allow the solid waste from collection vehicles to be dropped either on the tipping floor or directly into roll-off containers. Under this configuration, the Transfer Station can also serve in a dual role as a convenience center where private haulers and residents of the City and County can back-up their vehicles and deposit solid waste onto the tipping floor or into the roll-offs.

Under this scenario the transfer station grounds can be re-configured to receive and handle white goods, furniture, recyclables and hazardous materials such as motor oils, antifreeze and pesticides. Thus, it could be converted to a full service solid waste handling facility.

### 7.2.3 Transfer Station Modifications for Incineration of Municipal Solid Waste (MSW)

If incineration is selected as the method of final disposal of MSW in Livingston/Park County the Transfer Station may need to be re-located at the site of the incinerator. If an incinerator is installed at the present Transfer Station site, major re-configuration and re-construction will be necessary. The Transfer Station will have to serve as the tipping floor for segregating waste and for feeding combustible waste into the incinerator. If the incinerator is operated 8 hours per day, 5-days per week, the Transfer Station will need to accommodate storage of solid waste for a 24 to 48 hour period. Alternatively, collection of solid waste will have to be scheduled to match the operating hours of the incinerator. The new facility will require provisions for handling, storing and transportation of incinerator ash which may be classified as hazardous waste.

## 7.3 Waste Reduction / Recycling

### 7.3.1 Diversion Goals or Requirements

The State of Montana has adopted statewide diversion goals and timeframes (see Section 2. 2). These goals are not mandatory standards to be adopted by cities or counties. It is also understood that counties in Montana are not statutorily empowered to enact such policies but cities can do so if they choose. A diversion goal and associated timeframe for achievement expresses commitment to waste reduction / recycling and provides a common purpose for all sectors of the community. Progress toward the goal can be quantitatively measured over the designated timeframe and adjusted or redefined if desired.

Given the lack of state diversion mandates, it is probably not defensible to require recycling participation in Livingston. As well, there are convenient containers only for recycling cardboard from the commercial sector. Residential recycling opportunities are limited to the two Headwaters Cooperative Recycling depots in the City. There is pickup service for yard waste from May to November. To be pragmatic, requirements for recycling would necessitate implementation of more accessible recycling options such as a regular curbside / alley residential collection service.

The City is annually disposing 5,467 tons through the Transfer Station and 1,790 tons at the Landfill (see data in Section 4.2) for a total of 7,257 tons per year. Documented diversion consists of 180 tons / year of cardboard and 162 tons / year of composted yard waste. Assuming half the Headwaters tonnage comes from the City and half the scrap metals recovered at the Landfill are also from the City, which adds 118 and 262 tons / year respectively to the diversion rate. Thus, the total diversion is 722 tons / year. This translates to a diversion rate of about 9% (diversion rate % = tons diverted / tons generated). This information needs to be considered in establishing a realistic diversion goal/timeframe.

### 7.3.2 Increase Headwaters Cooperative Recycling Drop – off Centers

Additional sites within the City could be found for recycling bins from Headwaters Cooperative Recycling. However, it is understood this would necessitate purchase of bins by the City. The capacity of the bins is limited. It is not clear Headwaters is in a position to service more depot locations in Livingston. While Headwaters' efforts are laudable, the organization does not have the resources to address the central barrier to more recycling in the City and Park County as a whole – a centralized operation for the handling, aggregation, and storage of materials – as discussed under Section 7.3.6.

### 7.3.3 Residential Recycling Collection Service


The most convenient form of residential recycling is a collection service for recyclables on the same day trash is picked up. The City's automated refuse trucks could be used for recycling collection but only if all recyclables were commingled together in a cart (60 + gallon or 90 + gallons in volume). The capital investment in carts, plus the cost of an additional collection service, would likely lead to a rate increase. Most significantly, according to the Montana DEQ, there are no processors located near Livingston (in Bozeman, Butte, or Billings for example) with the capability of separating and processing commingled or "single stream" loads of residential recyclables. Finally, even if such a processor existed, the absence of a central recycling center / facility is a basic impediment to residential recycling collection service. Without such a facility for local off – loading and storage of materials, collection vehicles would have to drive directly from their routes to a processor, making the entire program too costly and inefficient to justify implementation.

### 7.3.4 Commercial Glass Recycling

Section 3.1.4 discusses the City's interest in purchasing a glass Pulverizer and initiating a recycling program for glass food and beverage containers from commercial businesses and institutions. If bins or dumpsters are set out for glass in commercial areas, residents may also use them for recycling glass. At this time it is not clear as to where the Pulverizer and stockpile of crushed glass would be located. If some, or all, of the City's composting operation were moved to the Landfill, as suggested in Section 7.3.5, space for such a facility would then be available on land near the Public Works Yard.

### 7.3.5 Location of City's Composting Operation

The composting operation is located on City property adjacent to the Public Works Yard. This land is in the vicinity of residences and there is little room for enlarging the operation. It appears that there are no defined boundaries to the composting operation. Consideration should be given to either enclosing the operation or preferably moving all or part of it to another location with room for growth that will not impinge on residences

or businesses. The most logical location is the Park County Landfill site where yard debris is already set aside and decomposing in an area not far beyond the scale and Landfill office. These two operations can be merged.

### 7.3.6 Materials Recovery Facility

Increasing recycling in the City and County necessitates an area with a building separate from the Transfer Station (or added on to it but not part of it) for the unloading, limited processing, aggregation, and storage of recyclables. Purchasing, or leasing a larger cardboard baler should be considered to improve processing efficiency. Otherwise, to control capital expenditures, processing would be limited to the manual removal of obvious and easily accessible contaminants. The city/county could enter into a long–term contractual agreement with a private firm for materials processing and marketing. The agreement may also cover facility operation and provision of needed materials handling and storage equipment.

The Materials Recovery Center / Facility could also be located on the land adjacent to the City's Public Works Yard once the composting operation is completely moved. There may also be a building and land available on County, or City property not presently being used. The Recovery Center would be open to residents and businesses for drop – off of recyclables. There should be a salvage and exchange component to the operation for repairable / reusable materials and products including electronic waste (e – waste: monitors, CRTs, fax machines, copiers, typewriters, CPUs, DVD or VCR players, radios, telephones, cameras, stereo equipment).

This facility can also be used to collect waste oil and hazardous materials such as antifreeze, paint, pesticides, etc. By encouraging separate hazardous material handling and disposal and with proper public education / awareness programs, such materials can be kept out of the MSW. Convenience offered to residents for disposing such materials also reduces the incidence of illegal dumping.

## 7.4 Management and Administration of Solid Waste Operations

Throughout this report it has been emphasized that the management and administration of solid waste operations in the City of Livingston and Park County be integrated to maximize the use of available resources and assets, and to optimize on the economies of scale. Integrating management of solid waste will have the following distinct advantages:

- Resources and assets of both the City and County will be fully used resulting in higher utilization of facilities, equipment and human resources

- Uniform solid waste ordinances throughout the City and County will help improve waste minimization and recycling, improve segregation of waste, improve policing of ordinance requirements.
- Improve solid waste collection service within the County along the fringes of Livingston.
- Green box sites in close proximity to Livingston will afford an additional option for City residents to deposit solid waste from missed pick-up days, spring clean-up and for collection of recyclables.
- Residents from both the City and County can be afforded equal access to facilities for depositing waste oil, anti-freeze, yard wastes, batteries, paint, pesticides and other hazardous materials. This will help control illegal dumping of such materials, discharging of such materials into the publicly owned sewer system and preserve the pristine environment of Park County.
- All initiatives such as composting of yard (green) wastes, pulverizing of glass and incorporation into concrete, use of waste oil for space heating (the precedence for such use already exists as it is being used at the Transfer Station by the County) etc., could be integrated to benefit residents of the entire Park County whether within or outside municipal limits of Livingston
- Financial resources and ability to seek funding from state or federal sources can be significantly augmented by integrating efforts of the City and County
- All capital expenditures can be amortized and assets depreciated over a much larger combined waste stream from both the City and the County. Thus, cost per ton of solid waste disposal would be minimized.
- Meaningful waste reduction and recycling can be accomplished by combining recycled products from both the City and the County. Larger more reliable and stable quantity of recycled products would attract more recyclers and ultimately may result in improved monitory return from recycled products.
- Larger quantity of solid waste will present more disposal options throughout the planning period. Incineration of MSW, development of a new Park County Landfill under current federal and state regulations and similar other options will become economically feasible with the combined waste stream from both the City and the County.

### 7.4.1 Creation of a Joint Solid Waste Authority

Integration of solid waste management in Livingston and Park County can best be achieved by creation of a joint solid waste management entity. This entity can be named

in accordance with the desires and discretion of the City Commission of Livingston and Board of County Commissioners of Park County. For the purpose of this report the entity will be called ***"Livingston/Park County Joint Solid Waste Authority",*** and for convenience, throughout this report it will be referred to as ***"the Authority".***

The Montana Department of Environmental Quality was contacted concerning the feasibility of establishing a joint solid waste management entity or agency in Park County. DEQ staff advised that the most relevant Montana Code Sections are 7 – 13 – 201 and 7 – 13 – 301 can be used for the creation of such an authority. DEQ representatives also noted there are joint solid waste management entities and agencies in Montana with contractual agreements that may serve as models for Park County and Livingston. For example, the City of Helena along with Lewis and Clark County have an agreement for County refuse to be accepted and transported for disposal through the City's transfer station. Another example is the agreement between Pondera, Glacier, and Teton Counties that formed the Northern Montana Joint Refuse District for the disposal of trash at a landfill in Conrad.

### 7.4.2 Proposed Make–Up of the Authority

The authority must have equitable representation from the various local governments. Make-up of the Authority will be consistent with the laws and statutes of the State of Montana. Adequate power must be vested in the authority for it to allow the necessary freedom to act in the best interest of the residents of Livingston, Clyde Park and Park County as a whole. The authority's charter should have adequate checks and balances so that its actions do not adversely affect any particular segment of the City or County. Make–up of the authority requires numerous legal and statutory issues which are best handled by the legal counsels of the City and County, and it is beyond the scope of this plan.

# 8 Solid Waste Disposal

## 8.1 Park County Landfill

Park County Landfill is licensed by the Montana Department of Environmental Quality as a Class II disposal facility. However, due to the 1981 **Sundling vs. Park County** court order (Appendix A) the Landfill cannot accept MSW. Therefore, the refuse now being handled through the Transfer Station could not be directed to the Landfill. Other materials from Groups II, III, and IV as defined in Section 2.1 can be disposed into the landfill. Sections 2.6 and 3.2.2 contain more detailed discussion on this topic.

## 8.2 Incineration of Municipal Solid Waste

### 8.2.1 History of Park County Incinerator

In about 1982, a 72 ton-per-day (TPD) capacity incineration system was installed in Livingston, Montana. It was designed to generate steam at 200 pounds-per-square-inch pressure (psi) that was to be sold to the Burlington Northern Railway[1] In 1986 the steam customer (Burlington Northern railroad) left Livingston and there was no other customer available for the steam. Accordingly, after 1986 the incinerator operated in the "by-pass" mode, without production and sale of steam as it was originally intended and designed. Thus, the incinerator did not operate as an energy recovery type system for most of its operating life. Montana DEQ regulations Section 17.8.316, Chapter 11 "Incineration" states the following regarding the Park County Incinerator "To meet the 2000 regulations for emissions and capacity, the incinerator was closed in March 2005". During the operating life of the incinerator Park County was cited numerous times by DEQ for regulatory non-compliance in particular regarding emissions and improper combustion temperatures in the incinerator. These citations ultimately culminated in legal action brought against Park County in State District Court. The court entered a decree against Park County and civil penalty of Ten Thousand Dollars ($10,000) was levied against the county.

There appears to be some acceptance of incineration of solid waste in Park County till this day and some residents would like the County to install a new incinerator. In the following sections several pertinent issues related to implementing incineration of MSW under the current regulatory environment are discussed. All of these issues must be carefully considered and evaluated against other solid waste disposal options that may be available to Livingston/Park County before embarking on another incinerator facility.

### 8.2.2 Suitability of Wastes for Incineration

[1] Incinerator information from Consutech Systems, Bob Lee (804) 746-4120.

Generally the following types of wastes are suitable for incineration:

- Garbage, trash, or refuse generated by residences, offices, and businesses: these include paper, plastic, food waste, cardboard, leather, textiles, wood and similar materials that are not in a suitable condition for recycling or re-use (i.e. they are broken, dirty or otherwise contaminated).
- Small amounts of metals, glass, concrete, rocks, and other non-combustible materials from solid waste. Realistically, it is not possible to sort out and remove such materials, however, these materials do not burn and promote wear and damage to incineration equipment.
- Automobile and pickup truck tires can be burned, but the rate at which tires are fed to the incinerator must be carefully controlled to minimize air emissions from the tires.

The following types of wastes are not suitable for incineration:

- Chemical and hazardous wastes, whether from residential, commercial, or industrial sources.
- Large tires (e.g.) from earth-moving equipment are generally not suitable for burning.
- Bulky wastes (couches, mattresses, and other large furniture) too large for the incinerator.
- Wastes containing large amounts of metal, glass, or other non-combustible materials.
- Wastes that could otherwise go to a landfill permitted to receive inert waste (e.g. tree stumps, concrete, rubble, broken asphalt, etc.).
- Yard wastes (lawn clippings, leaves, tree and shrub trimmings, etc.) contain too much moisture to burn efficiently and will generally decrease the efficiency of incineration.

### 8.2.3 Sorting of Waste Prior to Feeding Into the Incinerator

- It is difficult to separate suitable from unsuitable materials. A skid-steer loader (such as a “Bobcat”) may be used to push unsuitable materials off to the side of the waste tipping floor. Manual separation is inefficient, unpleasant and exposes workers to health and ergonomic hazards.
- Vehicles carrying yard, construction/demolition, and bulky wastes can be required to unload in areas that do not receive solid waste for burning. This is an

effective way to keep these unsuitable materials out of the incinerator feedstock, but may be an inconvenience to customers, especially if the materials are mixed in a single load.

- Because the green boxes are unsupervised, it is likely that non-combustible wastes (e.g. scrap metal, small appliances, lawn mowers, barbecue grills, glass, ceramics, etc.) and oversized wastes (e.g. furniture) will be commingled with burnable household and commercial solid waste (paper, plastics, food, etc.). Therefore, under these circumstances it will be difficult to make waste stream suitable for a small incinerator, of the type and size required in Park County. Manual segregation of such co-mingled wastes will be difficult, time-consuming, unpleasant and expensive.

### 8.2.4 Impact of Seasonal Waste Quantity Fluctuations on Incineration

In most geographic areas, solid waste experiences some seasonal fluctuations. For example, more waste is typically generated during warmer months than colder months, except for the Christmas holiday period. During periods of significant rainfall, the waste may contain more moisture and therefore not burn as well as during dryer periods.

In Park County quantities of solid waste from winter to summer fluctuate more drastically than most other locations. This is primarily due to the transient population experienced by the area from tourist traffic during summer months. In fact solid waste quantities have been noted to double during summer months. Such a fluctuation will require incinerator operations to be modified during summer. For example incinerator operating hours may have to be increased during summer to handle the additional solid waste load.

### 8.2.5 Incinerator Technologies for Municipal Solid Waste

The following incineration technology has been used in the United States for MSW:

- Controlled-air, modular (factory-fabricated) units suitable for facilities with a total capacity of up to about 200 Tons per Day (TPD). Livingston/Park County will fall in this category (approximately 75 TPD in 2025)
- Mass burn, field-assembled units suitable for facilities of at least 200 TPD or larger. This technology will not be suitable for Livingston /Park County due to the small quantity of solid waste projected during the planning period.

- Refuse-derived fuel (RDF) field-assembled units suitable for larger facilities of at least 200 TPD. Again, this technology is also not applicable to Park County.
- Rotary kiln and fluidized bed units; few currently operating, thus this technology does not have an established history of operation.

Since the 1970s, the vast majority of small (under about 150 TPD) U.S. incineration facilities have employed controlled-air, modular (factory-fabricated) units. While mass burn incinerators are more efficient at generating electricity, they are not technologically the appropriate choice for relatively small waste streams such as in Park County. Most WTE facilities currently operating in the US and Europe utilize mass burn technology; Spokane Washington and Marion County (in Brooks) Oregon are two examples.

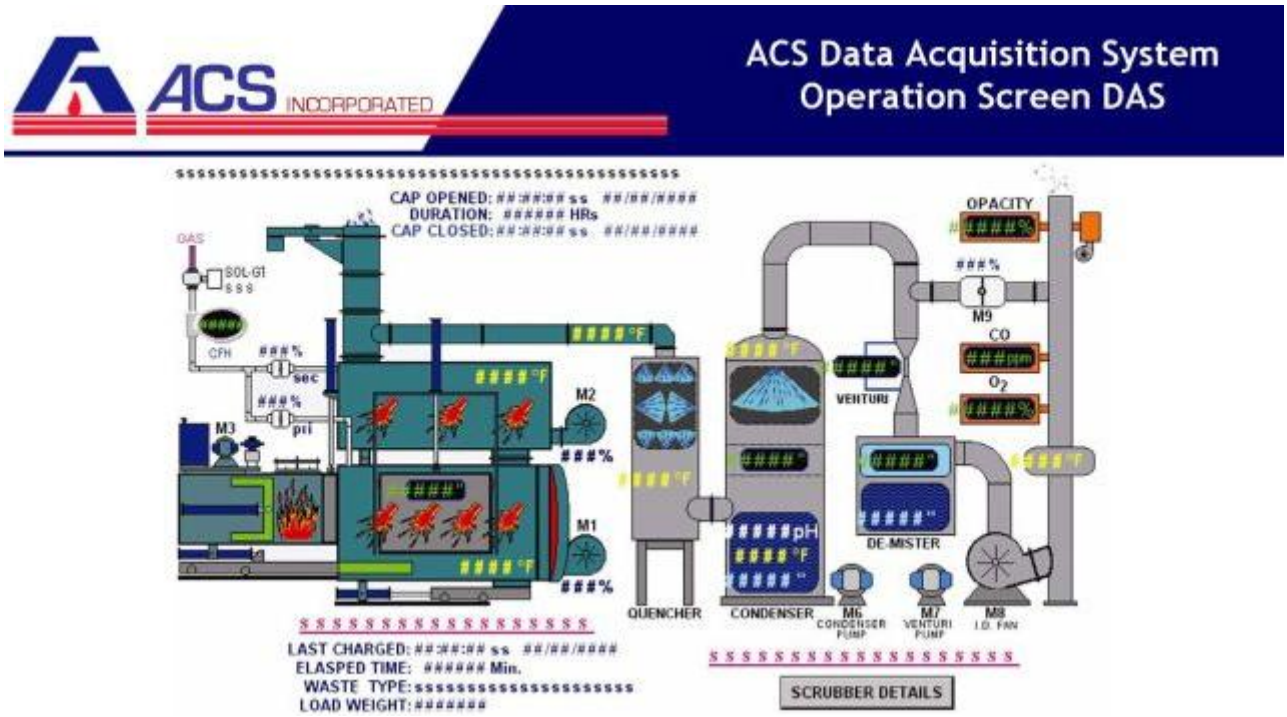
The term "modular incinerator" is synonymous with "controlled air incinerator." Both employ a pyrolysis process to first heat the waste and liberate a combustible gas, then burn the combustible gas. A modular incinerator consists of two or three chambers. Waste in a feed hopper is pushed into the primary chamber by a hydraulic ram. The waste sits on a series of stationary hearths. Hydraulic rams push the waste across each level and tumble it down to the next lower level hearth, promoting burnout of the waste. An ash ram pushes the residue through an opening at the far end of the incinerator, where it drops into a water-filled tank for quenching (cooling). A chain conveyor is typically used to drag the ash up an incline and into a dump truck or container, for subsequent disposal in a landfill that is specifically permitted to receive ash.

Modular incinerators burn waste in stages to reduce the amount of particulate matter (smoke) emitted. Waste is fed into a primary chamber where it dries and ignites, releasing volatile gases. This chamber uses the principle of pyrolysis to burn waste with less than the amount of oxygen required for complete combustion (called sub-stoichiometric conditions). By using less air in the primary, less particulate matter is carried into the secondary chamber by the hot gases. Fossil fuel-fired burners maintain the primary chamber temperature at about 1600$^{o}$ F.

The volatile gases flow to the secondary (oxidizer) chamber where more combustion air is added to consume carbon monoxide, particulate matter, and volatile organics. Local regulations often require that the gases be exposed to elevated temperatures for at least 1-2 seconds. This sometimes requires a third (tertiary) chamber. Fossil fuel-fired burners maintain secondary and tertiary chambers at a temperature required by local regulations, typically 1800$^{o}$ F.

**Figure 8.2.5-1: Schematic of Modular Incinerator**

**(Courtesy of ACS, Inc.)**




## 8.2.6 Air Pollution Regulations

The numerous Federal, state and local regulations for air emissions from incinerators address a wide variety of air pollutants including particulate matter, acid (corrosive) gases, and compounds that are toxic or otherwise hazardous to the health of humans, animals, and plants.

Incinerators in the 35 TPD to 250 TPD capacities (as is the case for Livingston/ Park County) are governed by *Federal regulations 40 CFR Part 60 " New Source Performance Standards for small Municipal Waste Combustion Units; Final Rule" promulgated on December 6, 2000*. The air pollutants that are covered under these regulations include: dioxins/furans; cadmium; lead; mercury; particulate matter; opacity; Sulfur dioxide; hydrogen chloride; nitrogen oxides; carbon monoxide and fugitive ash. These regulations are comprehensive and cover the following major components:

- Preconstruction requirements
- Materials Separation Plan
- Siting Analysis
- Good Combustion Practices

- Operator Training
- Operator Certification
- Operating Requirements
- Emission Limits
- Monitoring and Stack testing
- Record keeping and Reporting

These regulations require that the new incinerator consist of continuous and automated emissions monitoring for carbon dioxide, sulfur dioxide, nitrogen oxides and carbon monoxide. The emissions requirements for Livingston/Park County can only be set when a permit application is submitted and reviewed by the state and federal agencies. Therefore, at this early planning stage it is not possible to provide a comprehensive list of emission standards that may be permitted in Livingston/Park County. Such an unknown poses an implementation risk for a MSW incinerator.

### 8.2.7 Incinerator Air Pollution Control

Hot gases from an incinerator are treated in a scrubber to remove particulate matter, acid gases, and toxic compounds. First, the gases must be cooled from about 1800$^{o}$ F. down to less than about 400$^{o}$ F. This can be done by running the gases through a boiler or heat exchanger to remove heat, or spraying it with water or a solution containing lime.

Particles are minimized by maintaining proper combustion conditions (adequate temperature, turbulence in the combustion chambers, and sufficient residence time in the incinerator). Particles can be removed by capturing in a fabric filter (often called a bag house) that works like a furnace filter or vacuum cleaner bag. Alternatively, the particles can be electrically charged and then captured on magnetized metal plates (electrostatic precipitator), similar to a household electronic air cleaner.

Typical acid gases such as hydrochloric and sulfuric acid result from burning waste that contains chlorine (some plastics, anything containing salt) or sulfur. These can be neutralized by contacting the incinerator gas with lime or a similar alkaline solution. Dry scrubbers inject dry lime powder into the gas stream, while wet scrubbers use a liquid lime solution. The water evaporates and the lime particles, along with sulfur or chlorine compounds, are captured by the particle-removal device (bag house or precipitator described above).

Toxic or hazardous compounds are controlled by:

- Banning them from the waste entering into the incinerator (directing them to a licensed hazardous waste facility).
- Maintaining proper combustion conditions as described above for particles.
- Capturing them along with the lime particles.
- Injecting powdered activated carbon into the gas stream; toxic compounds attach to the carbon powder and are captured in the precipitator or bag house.

### 8.2.8 Waste – to – Energy (WTE)

The heat released by burning solid waste is typically captured in a boiler, producing steam and (occasionally) hot water. Steam can be piped directly for use in space heating, industrial processes, or drying applications. In many European cities, it is common to have "district heating" systems of underground pipes that send steam to nearby buildings to provide space heating. In the U.S., steam is typically used to turn a steam turbine that in turn drives an electrical generator. Most large (over 400 TPD) U.S. incineration systems generate and sell electricity to help offset their operating costs.

The following factors contribute to the success of a WTE system:

- A long-term, reliable, politically stable supply of solid waste. This generally requires that local jurisdictions sign an agreement to send a certain amount of solid waste to the WTE plant each year. Each jurisdiction pays for a guaranteed minimum quantity of waste, regardless of whether it actually delivers the waste. The agreement must last long enough to recover the cost of the plant.
- Sufficient revenue to recover capital costs (interest and principal on borrowed funds) and operating costs (labor, utilities, ash disposal, equipment replacement, repairs, etc.). Revenues include
    - tipping fees ($/ton charged to dispose of waste at the WTE plant);
    - income from the sale of electricity or steam; and
    - Funds contributed by local governments.
- Continuing citizen support for the WTE facility and its operations. Dealing with citizen protests or lawsuits regarding issues such as air or water emissions, odors, truck traffic, etc. is time-consuming and expensive.
- Stable regulatory environment. Essential changes in regulations may require frequent and/or expensive upgrades or changes in plant operation, the costs of which may be difficult to recover without increasing tipping fees.

WTE will not be economically feasible in Park County due to the following reasons:

- The current (estimated) 12,000 Tons per Year (TPY) solid waste generation rate in Park County represents a relatively small quantity of MSW to burn, compared with other U.S. locations where WTE has been successful. Small amounts of waste convert to small amounts of steam or electricity and results in small a revenue not justified by the additional owning and operating cost of a WTE facility.
- A considerable amount of capital investment (in millions of dollars) is required to pay for the equipment and buildings at a WTE plant: incinerator(s), air pollution control equipment, steam turbine, electric generator, control system, and waste storage and administration buildings. Funding a WTE plant will require the sale of bonds to finance the facility.
- Selling steam requires a major steam customer in close proximity to the WTE plant. A piping system to deliver steam and return condensate (water from the condensed steam) must be constructed between the WTE plant and the steam customer). Unlike Europe, it is rarely the case that an American industrial steam user is located an economical distance from the WTE plant. Furthermore, the WTE plant would be required to deliver steam according to the customer's demand schedule, typically 24 hours a day, 7 days a week for most industries. The modular incinerators that would likely be used at a Park County facility are not suitable for 24/7 operation; they would probably operate 5 days a week before shutting down for routine maintenance. The resulting intermittent steam delivery would probably not be acceptable to most industrial users.
- Selling electricity requires even more infrastructure. Besides the boiler to produce steam, there is a steam turbine/ generator combination to generate electricity. Although the cost of electricity (cents per kilowatt hour) may seem high to most homeowners, who pay the retail rate for electricity. A WTE plant would be selling electricity at wholesale rates, which are considerably lower. Utilities are no longer required by law to purchase electricity from small facilities such as WTE plants. A Park County WTE facility would produce relatively small amounts of power. Worse yet, the power would be intermittent (say 5 days a week) and not have the high degree of reliability required by a utility. For these reasons, a Park County WTE facility would probably be paid lower rates for its electricity.
- Pending a detailed cost/benefit analysis, it seems unlikely that a WTE would be able to cover its operating costs and pay off the bonds using the small revenue stream resulting from sale of small amounts of electricity or steam, unless tipping fees were relatively high.

Under the following scenarios a WTE facility may become feasible in Livingston/Park County:

- Negotiating favorable tipping (disposal) fees for out-of-county waste may bring enough extra waste to a Park County WTE plant to create operational economies of scale, as well as additional revenue.
- If tipping fees for wood and other combustible materials are favorable, a WTE facility may attract burnable waste away from the Park County inert materials landfill and increase WTE revenues.
- Scrap tires are a problem waste: they pose a fire and mosquito hazard if stored outdoors and do not compact well in landfills. Theoretically, limited amounts of car and pickup truck tires could be burned at a WTE plant, and their high energy content would increase the output of steam/electricity. Special fees for tire disposal (e.g. $1 a piece) bring in additional revenue that is disproportionately higher than solid waste, on a $-per-ton basis.
- Coos County, a non-urban area on the Oregon coast, has a 150 TPD incineration facility using equipment similar to the former facility in Livingston. It burns approximately 24,000 tons per year, about twice the waste generation of Park County. In 2002, a feasibility study[2] found that even if waste incineration was supplemented with scrap tires or out-of-county waste, it would not improve the economics enough to make WTE feasible for Coos County.

### 8.2.9 Incinerator Ash Disposal

An incinerator produces two kinds of ash: 1) bottom ash (metal, glass, soil, rocks, unburnable materials, plus incompletely-burned pieces of potentially burnable materials) and 2) fly ash (particulate matter captured by the air pollution control system). In general, bottom ash is less of an environmental concern because toxic compounds are less likely to leach out of bottom ash. Fly ash may contain heavy metals and other toxic compounds and is considered more of an environmental concern.

Ash must pass the Federal Toxicity Characteristic Leaching Procedure (TCLP) test before it can be disposed into a landfill. Ash must be tested on a regular basis, with frequency of testing determined by state or local environmental officials.

DEQ[3] has indicated that incinerator ash is classified as a “non-hazardous industrial solid waste” and would be allowed to be disposed of in a Montana Class II landfill. The definition of “Non–Hazardous Industrial Solid Waste” used by DEQ is found in

[2] EnviroMech, *Waste-to-Energy Feasibility Study*, for Coos County, Oregon, 2002
[3] Tim Stepp, Montana Department of Environmental Quality, phone call June 13, 2006

Title 40, Code of Federal Regulations, Part 261–4–B–1 and in the Resource Conservation and Recovery Act, Section 3001(i). This classification **applies only to ash from household waste that is incinerated without energy recovery**.

If commercial waste is mixed in with household waste, or if energy is recovered, the ash would then need to be tested for hazardous characteristics. If the ash proves to be hazardous, it probably cannot be disposed of in the Park County Landfill. Disposal at a landfill licensed for hazardous waste will likely be more expensive than at the Park County Landfill, and involve higher transportation costs.

If the Park County Landfill accepted ash from a new Park County incinerator, DEQ would require testing of the landfill leachate for unacceptable levels of contamination. The incinerator would need to obtain a license to accept Group II wastes and to dispose of the residual ash. Other states require that ash be placed in a separate, lined landfill cell and not be mixed with other solid wastes. The Park County landfill is unlined and is currently permitted to receive "inert waste". Disposing incinerator ash into the Park County landfill may expose the incinerator's owner/operator to potentially significant financial liability if the unlined landfill is determined to cause pollution of soil or groundwater. Regardless of the "real" contribution of the ash to the pollution problem, the cost of defending the incinerator in an environmental lawsuit will likely be substantial.

Ironically, no determination can be made at this planning stage with regards to the disposal of incinerator ash. The disposal will solely be based upon Toxicity Characteristic Leaching Procedure (TCLP) test results. This uncertainty of ash disposal leaves a significant cost factor unknown at this stage and adds yet another implementation risk for a new incinerator in Park County.

### 8.2.10 Combined Burning of Medical Wastes and Municipal Solid Waste

Modular incinerators are commonly used to burn medical waste in the U.S. While operating parameters (e.g. amount of combustion air, process control, etc.) may be slightly different for solid waste and medical waste, it is technically feasible to burn both types of waste in the same modular incinerator. However, there may be regulatory requirements that limit, or prohibit burning of medical wastes in the same incinerator. Regulations may require the two wastes to be burned at separate times; in the 1990s, this was the case in Ferndale, Washington where an incinerator burned medical waste exclusively during certain hours each week, and solid waste the remainder of the time. Such dual waste incineration will require special permitting from the state and federal agencies and may not be optimum for Livingston/Park County.

### 8.2.11 Incinerator Operation

In general, it is more efficient to operate an incinerator continuously (24 hours a day). Intermittent operation ("cycling" the incinerator) requires fossil fuel to heat up the incinerator to proper burning temperatures. Heating and cooling cycles eventually can cause damage to the refractory ("fire brick") lining of the incinerator chambers, increasing repairs, an important component of operating and maintenance (O&M) costs.

An incinerator sized for 24 hr/day operation will be smaller than a unit sized for 8 hr/day operation. Therefore, the continuous-burn (24 hr/day) unit will have a lower capital cost. Fossil fuel use will be lower as well, since the incinerator does not need to be warmed up each morning.

Modular incinerators typically operate 5 days a week, allowing the weekend for cool-down and maintenance. A two-week shutdown for annual maintenance and overhaul is also typical. Therefore, 250 operating days per year is normally assumed when calculating the necessary incineration capacity.

### 8.2.12 Infrastructure Requirements for Incinerator Facility

An incineration facility for Park County would require the following major components:

- Scales and scale house.
- Incinerator building with waste storage area, control room, restrooms, lunch room, meeting room, office, storage, maintenance shop.
- Modular (controlled air) incinerators and air pollution control system. Some of the equipment might be located outdoors.
- Site roadways, landscaping, parking and stormwater control.
- Utilities: sewer, water, stormwater, natural gas (or other fossil fuel), electricity, phone).
- Rolling stock: front-end loader, pickup truck.

Assuming that electricity is being generated (as opposed to just selling the steam), a WTE facility would require all of the above, plus the following:

- Steam generating equipment (boiler), steam turbine, electrical generator, control room and employee facilities.
- Electrical substation and power transmission lines.

### 8.2.13 Capital Investment Components for an Incinerator Facility

"Hard" components of the capital cost include:

- Purchase of land to build the facility (10 acres including buffers).
- Site improvements (roadways, parking, landscaping, utilities).
- Off-site improvements (access roads, traffic signals).
- Construction of buildings.
- Equipment purchase and installation

"Soft" components of the capital cost include:

- Environmental and land use permitting process (cost increases in proportion to the amount of opposition to the project). An Environmental Impact Statement (EIS) may be required for permitting a facility in Park County.
- Engineering feasibility studies, design, plans and specifications.
- Legal fees during project development.
- Administration/staff time during project development.
- Economic feasibility studies, financing arrangements, bond reports.
- If WTE, negotiation of power sales agreement.
- Testing of air emissions from completed facility to obtain a Permit to Operate.

Although recent and current cost data is available for the design, permitting, construction, and operation of landfills, this is not the case with MSW incinerators. The most recent MSW incineration facilities in Montana, Idaho, Washington and Oregon were built in the late 1980s and early 1990s. The 550 TPD WTE facility in Marion County, Oregon was constructed in 1985 at a cost of about $40 million.

A small (about 4 TPD) incineration only (not WTE) facility was built in Bridgewater, New Hampshire in 2005 for about $2 million. Advanced Combustion Systems (ACS), a Bellingham, Washington manufacturer, provided the incinerator, air pollution control equipment, controls and air emissions monitoring equipment. Besides the equipment and the usual incineration site improvements, the $2 million cost included closing/capping a small existing landfill and providing, propane storage (natural gas was not available as an auxiliary fuel). It is not clear whether the town already owned the land, or had to purchase it for this project. The costs for Bridgewater are indicative of the range of capital costs for incineration facilities, but are not strictly comparable with Park County.

An incinerator sized to burn Park County's MSW **in 2006** would need a capacity of about 47 TPD. This assumes that waste is burned 250 days per year (5 days a week, allowing weekends for routine maintenance, plus 2 weeks for major overhauls).

In 2006 the major equipment (incinerator, air pollution system, controls and emissions monitoring equipment) would cost approximately $2.1 million[4]. This neither includes the cost of site improvements, buildings, nor "soft" costs related to facility development.

To account for growth in the waste stream, two incinerators would be required to handle the waste **in 2025**. The equipment and installation would cost about $4 million (2006 dollars). Other site improvements (land purchase, roads, utilities, buildings, truck scale, front-end loader) could range from $500,000 to $1,500,000. "Soft" costs (engineering, permitting, legal, emissions testing, etc.) could add between $200,000 and $400,000. Therefore, based on preliminary information, the range of capital costs would be from about **$4.7 to $5.9 million**.

Note that the costs listed above are for incineration only, **NOT WTE**.

### 8.2.14 Operating Costs

Operating costs depend on a variety of factors, including:

- Labor (scale attendant, 3-4 plant operators/equipment drivers/maintenance personnel, bookkeeper, plant manager, etc.). Labor rates and customary fringe benefits vary widely in between geographic areas and public/private sectors.
- Insurance (liability, fire, property damage, environmental pollution, etc.)
- Utilities (water, sewer, electricity, stormwater disposal, phone, Internet)
- Permits and fees (solid waste, sewer, air pollution, etc.)
- Periodic air emissions testing
- Ash disposal (assume that 1 ton of MSW produces about 0.2 tons of ash). Cost of ash disposal can vary quite significantly depending upon the mode in which it must be disposed. If ash is fails the TCLP test and is classified as hazardous waste, it will have to be shipped to a permitted hazardous waste handling and disposal facility. The closest facility may be in either Oregon or Washington states. Ash disposal and associated cost of disposal is a major unknown and thus introduces a high operating cost risk in incinerator operation in Park County.
- Equipment maintenance
- Sinking fund to pay for major refurbishment of equipment (e.g. every 5 years)
- Site and building maintenance.
- Emergency fund.

[4] Phone conversation July 27, 2006: Terrill Chang (URS) and Mike Milnes (Advanced Combustion Systems)

Operating costs in the range of $60 to $80 per ton (2006) could be expected. Many costs (e.g. some labor, insurance, permits, some utilities, sinking fund, building maintenance, and emergency fund) will be relatively constant, provided a certain threshold amount of waste is burned each year. However, some costs will vary in proportion to the amount of waste burned (e.g. ash disposal, electricity).

### 8.2.15 Small Incinerator for Cooke City

Cooke City is an excellent candidate for a very small incinerator. During the approximately 4 months a year when it is inaccessible by road, trucking waste away to a disposal site is treacherous. Storage of waste for a long period could create odor and vector (insects, rats, etc.) problems. A feasibility study is recommended to evaluate the regulatory, technical, economic, environmental, and political/social issues associated with constructing and operating a small incinerator in Cooke City.

A significant factor in considering Cooke City as a candidate for a small incinerator is that it may qualify for an exemption to the Federal air pollution regulations that allow very small incinerators (less than 35 TPD) that are at least 50 miles away from a major metropolitan area (population of at least one million) to operate without air pollution control devices. However, it appears that an air quality permit will still be required for even this small incinerator. If a Cooke City incinerator did not require air pollution control and emissions monitoring equipment, this would significantly reduce the capital and operating costs.

### 8.2.16 Brief Evaluation of Five Technologies Previously Investigated by the Citizens' Group of Park County

Barlow Industries

The written information made a case for incineration in general, but did not indicate a technology supplier or manufacturer. Therefore, it is difficult to comment further on Barlow Industries.

Consutech

Consumat supplied many of the modular (controlled air) MSW incinerators installed in the US in the 1970s through early 1990s. It appears that Consutech Systems has purchased the rights to manufacture the Consumat-designed incinerators. The controlled air incinerator technology is appropriate for consideration in Park County and/or Cooke City.

EnerWaste International

The EnerWaste system uses the same two-stage combustion principles as do modular, controlled air incinerators: a primary chamber with sub-stoichiometric conditions

(less oxygen than theoretically required to complete the combustion process), followed by a secondary chamber with excess air conditions (sufficient oxygen to complete the combustion). The EnerWaste primary chamber may be larger than that of other modular incinerators, allowing it to receive bulky waste such as couches. The EnerWaste technology is appropriate for consideration in Park County and/or Cooke City.

Princeton Group

This technology utilizes a pyrolysis process to consume MSW, just as the Consutech and EnerWaste International technologies do. However, the equipment configuration may be different from the other two manufacturers. The literature supplied did not indicate the location of any US facilities where their equipment is being used.

Wheelabrator Technologies

Wheelabrator Technologies' 800 TPD WTE plant has operated successfully in Spokane, Washington since 1991. It employs a European mass burn grate system that provides excellent burnout of MSW and generates electricity for sale. However, this mass burn technology is not economical for small (200 TPD or smaller) facilities such as Park County, and is rarely considered for systems less than 500 TPD.

No matter which technology/manufacturer is considered for incineration in Park County, the system will require an air pollution control system. On the other hand, because of its very small size and remote location, Cooke City may qualify for an exemption from Federal air pollution limits. Montana may or may not concur, and may have some air pollution limits for a Cooke City incinerator.

## 8.3 Out – of – County Landfill(s)

Currently Park County solid waste, including Livingston, is being rail hauled to Valley View landfill approximately 120 miles from Livingston. Considering the small amount of waste generated in Park county transportation to an out- of-county landfill does present a viable option. Transporting solid waste outside the county does present the following operating risks:

- In the absence of a long term agreement with the landfill that is out of Park County's jurisdictional reach can suddenly be closed or stop accepting imported solid waste leaving Park County in a difficult position
- Long haul of solid waste presents the risk of sudden shut down of the railroad route due to an accident, inclement weather, other natural or man made causes

These risks can be mitigated by entering into a long term commitment with the remotely located landfill and by planning for a back-up landfill location where solid waste may be directed during an emergency.

### 8.3.1 Rail Haul

Park County currently has a 5–year contract with Envirocon, Inc. for the rail transport and disposal of refuse at the Valley View Landfill in Jefferson County. This arrangement is in its second year of operation with three years remaining. A disposal option for the County and City of Livingston as well would be to negotiate a long – term contract with Envirocon to extend the rail transport / disposal service for a longer period of time. This option may require the purchase of additional bottles for transporting increased quantities of MSW. Enhanced waste reduction / recycling can at least partially offset the need for additional bottles.

To evaluate this disposal option an escalation rate (2% annually) throughout the planning period was applied. The table below summarizes projected rates through the planning period.

**Table 8.4.1-A:**
**Projected Envirocon Rate Increases for Rail Haul / Disposal of Refuse**

| Year | Rate / Ton | | Year | Rate / Ton |
|---|---|---|---|---|
| Year 1 | $36.81 | | Year 11 | $44.87 |
| Year 2 | $37.55 | | Year 12 | $45.77 |
| Year 3 | $38.30 | | Year 13 | $46.68 |
| Year 4 | $39.06 | | Year 14 | $47.62 |
| Year 5 | $39.84 | | Year 15 | $48.57 |
| Year 6 | $40.64 | | Year 16 | $49.54 |
| Year 7 | $41.45 | | Year 17 | $50.53 |
| Year 8 | $42.28 | | Year 18 | $51.54 |
| Year 9 | $43.13 | | Year 19 | $52.57 |
| Year 10 | $43.99 | | Year 20 | $53.63 |

### 8.3.2 Truck Haul to Out – of – County Landfill

One option involves hauling solid waste in large trucks (22 Ton) to an out – of - county landfill, such as Logan or Valley View. If a long term disposal contract can be negotiated at a reasonable tipping fee, hauling solid waste to a facility outside Park County (within reasonable distance) may present an option for disposing

Park County/Livingston solid waste. This scenario will involve acquiring two trucks initially, with a third truck in 10 years. Furthermore, this scenario will require a re-design and re-configuration of the Transfer Station. Trucks will make one round trip a day to the landfill site about five (5) days per week. Alternatively, trucking of solid waste could be contracted on a long term contract with periodic renewals every five (5) years. Following are advantages of this option:

## 8.4 New Municipal Solid Waste Landfill in Park County

Disposal of solid waste in MSW landfills in the Western United States is quite common. If sited properly and constructed under the latest state and federal regulations, landfills do provide a long term economical solution to solid waste disposal for communities.

### 8.4.1 Landfill Siting

Ideally a tract of land approximately 25 to 50 acres (or larger) located in the vicinity (10-15 miles or less) of Livingston (where 75% of the solid waste is generated) can provide for a reliable solid waste disposal option for Livingston/Park County. In selecting a site for the landfill the following key criteria must be considered:

- Airport safety – new landfills are not permitted in the vicinity of airports. This restriction is placed on siting since, landfills can attract birds and cause Aircraft Bird Strike Hazard
- Flood plains- Landfills cannot be located in areas prone to flooding
- Wetlands – Wetlands are considered important ecological resources, thus protected under federal regulations. Landfills cannot be built in wetlands.
- Fault Areas and Seismic Zones – To prevent pollution from escaping from the confines of landfill due to earth movement, landfills are not allowed in areas prone to seismic activity
- Unstable Areas – Landfills cannot be located in areas subject to landslides, mudslides or sinkholes

It is desirable to consider several alternative sites and evaluate the alternatives with respect to the above regulatory criteria in addition to economic feasibility criteria such as distance from population center, access, private and sensitive properties in the vicinity, depth to groundwater, land value, availability of power etc.

### 8.4.2 Landfill Regulations

State of Montana DEQ implements the Subtitle D program for permitting landfills. Standards for Solid Waste facilities are specified in ARM 17.50.505 and in ARM 17.50.508. Montana requires permit applications to include a geologic and hydro-

geologic and study report. State of Montana is in the process of reviewing and revising solid waste management rules. At this time it is unknown as to the nature of the changes being implemented.

When a landfill is closed the owner of the landfill must submit a closure/post closure plan. For 30 years after closure the owner must maintain the final cover (cap) and monitor groundwater to verify that the leachate from groundwater is not entering the groundwater table.

To ensure that monies are available to correct possible environmental problems, landfill owners are required to demonstrate that they have the financial resources to cover expenses for site closure, post closure and clean-up. Typically, a portion of the revenues from tipping fees is set aside by landfill owners to handle this financial responsibility.

## 9.0 Solid Waste Management Scenarios

In Sections 1 through 8 numerous aspects of the elements of solid waste management were discussed. Based on the discussions in previous sections, four (4) Solid Waste Management Scenarios were formulated, each of these scenarios are discussed in the following sub-sections. Formulation of these scenarios follows the guiding principles discussed in Section 6, Guiding Principles in Formulating Solid Waste Management Plan. Furthermore, these scenarios are based on the premise that City of Livingston and Park County will form a joint authority and consolidate operations as much as it will make the operations more efficient and cost effective on a long term, discussed in Section 3.3.2, Interlocal Solid Waste Subcommittee.

Leaving solid waste management fragmented between the City and the County through the planning period is not a prudent option. Thus, none of the scenarios considered herein involve independent City/County operations. However, all scenarios do involve utilizing the resources and assets of each entity to the fullest extent possible and even expanding the role of the entity in solid waste management. One such example is curbside collection of solid waste. All scenarios considered involve the City to expand its curbside program to County residents in the vicinity of the municipal boundaries.

Some cost analysis is provided for each of the selected scenarios for comparison purposes only. These costs are based on historical information available from professional publications, experience of other solid waste management districts, communications with equipment vendors, and professional judgment of the engineering/planning team. Extreme caution should be exercised in interpreting these costs due to the following reasons:

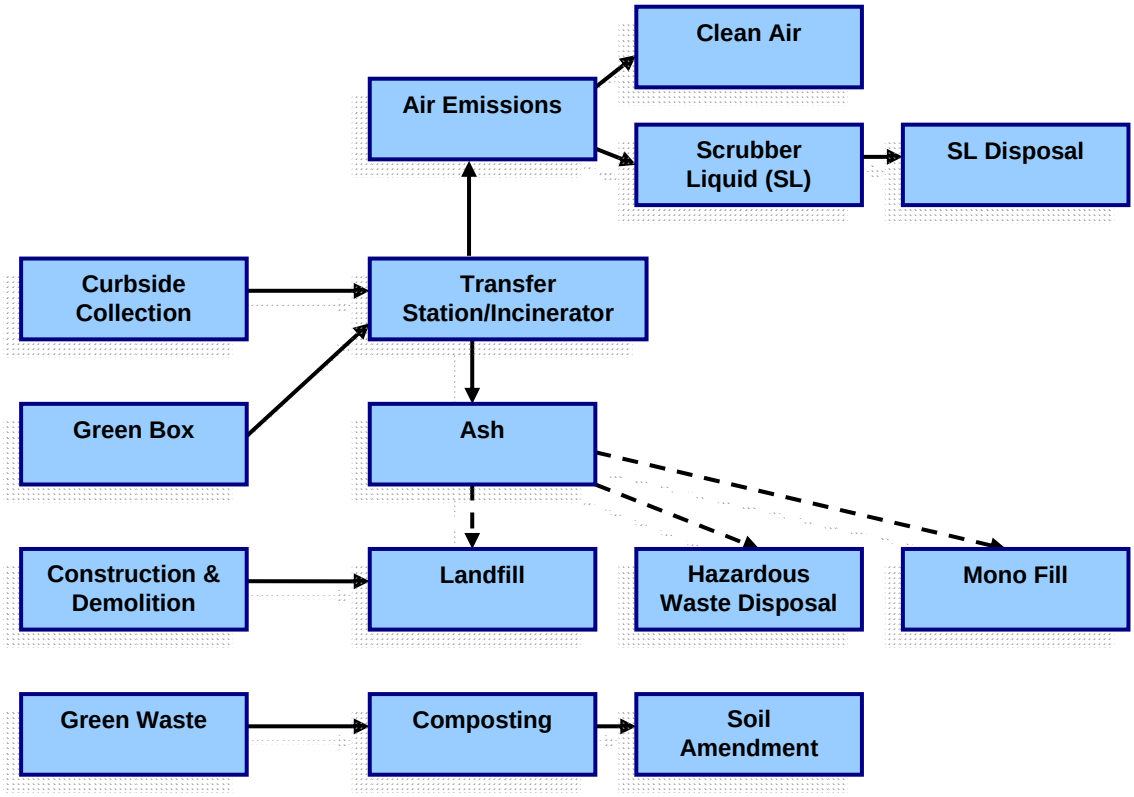
- Federal and state regulations related to solid waste management and air emissions typically do not provide definitive guidance. In most cases these agencies demand that the owner submit a very detailed permit application and only upon review of such an application is the agency willing to set design criteria for a system such as an incinerator or Sub Title D landfill for MSW.
- Many of the solid waste handling and disposal systems have significant design variations. Therefore, without at least a preliminary design, it is difficult, if not impossible, to accurately determine the cost. This is also the reason why costs from other localities should be carefully reviewed, since in most cases these costs cannot be extrapolated from region to region.
- Labor, material, equipment and overhead costs can vary significantly from region to region. Thus, published information is difficult to be extrapolated.

Solid waste handling and disposal facilities are extremely sensitive to tonnage of solid waste handled. The large capital investments and operating costs are greatly dependent on scaling factors. This makes comparison of systems from one locality to the other very difficult.

## 9.1 Scenario A – Collection at Curbside and Green Box sites and Incineration of Combined Waste

This scenario is schematically presented in Figure 9.1-1 below. Under this scenario solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the unincorporated County area will continue to be collected at green box locations. All City and County solid wastes, including commercial wastes, but excluding construction and demolition debris wastes, will be transported to an incineration facility. Construction and demolition waste will continue to be disposed at the existing Park County landfill. The incineration facility will consist of a transfer station type tipping floor where large objects and non-combustible type of materials will be removed from the waste stream. This sorted waste stream will be fed into the incinerator.

**Figure 9.1-1: Scenario A – Incineration of MSW**



A new site for the incinerator will have to be selected where the solid waste handling (like transfer station) operations and incineration can be conducted under one roof. Sufficient land area will have to be acquired for these operations since adequate buffer should be provided.

One incinerator of adequate capacity to handle current solid waste quantities can be utilized. However, sometime during the planning period another incinerator will have to purchased and integrated into the system. If just one large incinerator, sufficient to handle the anticipated solid waste quantity at the end of the planning period is employed, it will not operate efficiently. Furthermore, one incinerator does not allow any redundancy during downtime when the incinerator needs to be cooled down and maintained. Most incinerators require a major overhaul and maintenance every five (5) years which may require longer downtime. Once again, if only one large incinerator is used, solid waste will have to be disposed at other facilities during the extended downtime. Therefore, from a practical and operational reliability stand point two incinerators should be used in Park County.

There will be two 48TPD modular incinerators and associated scrubbers, control and monitoring system located in the incinerator building. Two incinerators will allow for maintenance of one of the incinerator while the other is in operation. It is anticipated that the incinerators will operate 5 days 24-hours per day. After a five-day cycle the incinerator will be cooled down, checked and maintained as necessary. While this maintenance is proceeding the other incinerator will be used as duty incinerator. Thus, duty incinerator will be rotated weekly.

Table 9-A provides an opinion of capital and operating costs for such a facility. Note that collection costs are excluded from the spread sheet since these costs are common to all scenarios. Following are advantages and disadvantages of this scenario:

**Advantages**

- Incineration reduces solid waste volume to about 20% in the form of ash. This huge volumetric reduction reduces the need for disposing solid waste in landfills that require large tracts of land.
- Incineration of solid waste can provide a reliable method of disposing solid waste in Livingston/Park County during the 20-year planning period.
- All MSW is reduced to inert ash thus eliminating the potential of nuisance causing vectors and insects. Although, problems of vectors and odors from putricible waste materials on the tipping floor will continue to occur, similar to current transfer station operations.

- Livingston/Park County may be able to handle additional wastes from out of county areas and charge a tipping fee for the incinerator to enhance revenues. However, the amount of additional waste that can be accepted at the incineration facility is limited by the incinerator capacity. Additional operating hours can help enhance the amount of solid waste burned.
- Residents of Park County/Livingston are familiar with incineration of MSW and this process appears to have good acceptance by the public. Thus, implementation of a new incinerator in Park County may be easier than other localities, where incineration faces public opposition due to concerns of air emissions.

**Disadvantages**

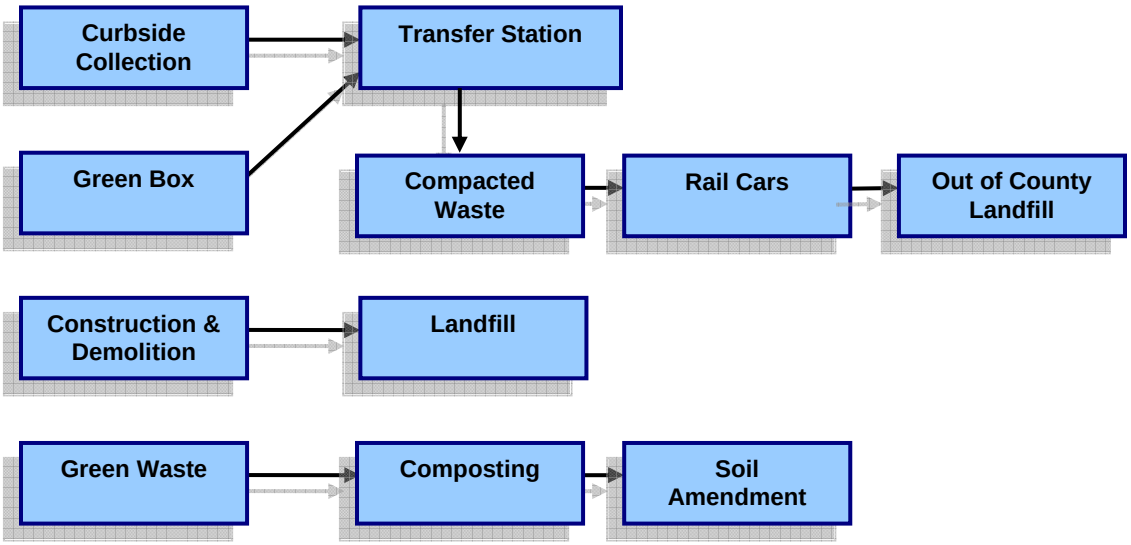
- There are few MSW incinerators of the capacity similar to Park County currently in use within the USA. Thus, there is very limited historical information available for MSW incineration for similar size plants. Lack of such information makes it difficult to project owning and operating costs reliably.
- Due to stringent federal and state requirements for air emissions from MSW incinerators, permitting of a new incinerator is time consuming, cumbersome and expensive.
- Incinerator operations have to match collection schedules. Solid waste collected from the various sources must be deposited at the tipping floor and burned on the same day. Putricible solid waste cannot be stored for extended periods, since extended storage will cause problems with nuisance odors, vectors and can impact employee health. Thus, the luxury of 7-day collection and disposal cannot be afforded under this scenario. This creates a problem in disposing highly putricible food wastes from restaurants and food processing facilities that require collection and disposal on a daily basis.
- This scenario has the highest per ton cost ($125/T) of all scenarios and even at this high cost; the reliability of this estimate is questionable. This uncertainty in estimating life cycle cost is primarily due to the fact that the actual system design and monitoring of incineration emissions and ash disposal cannot be estimated until a permit application is approved by the USEPA and State of Montana DEQ.
- Ash from incinerators that accept MSW including commercial and industrial wastes must be tested for Toxicity Characteristic Leaching procedure (TCLP). Only if this test is negative, the ash can be disposed into a landfill. This test has to be conducted routinely and if at any time the test fails, ash must be disposed at a permitted hazardous waste disposal facility. This can add significantly to the cost of operation of a MSW incinerator.

- If a wet scrubber is used to meet the air emissions requirement of the permit, a contaminated waste liquid stream from the scrubber has to be handled and disposed. Depending upon the characteristics of the liquid stream it may not be discharged into the public sewer system and special disposal arrangements may have to be made. Once again, all of this adds to uncertainty of operating costs.
- Incineration requires purchase and use of auxiliary fuel for starting and supplementing combustion. Besides adding to the operating cost, it is an undesirable and unfriendly way of using up precious fossil fuels (natural gas, heating oil or propane).

## 9.2 Scenario B - Collection at Curbside and Green Box Sites and Rail Haul to Out of County Landfill for Disposal

This scenario replicates the existing transfer and disposal methods being used by Park County since 2005. This scenario is schematically presented in Figure 9.2-1 below. Under this scenario Solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the unincorporated areas of the County will continue to be collected at green box locations. All City and County solid wastes including commercial wastes, but excluding construction and demolition debris, will be transported to the existing Transfer Station facility. Construction and demolition waste will continue to be disposed at the existing Park County landfill

**Figure 9.2-1: Scenario B – Rail Haul to Out – of – County Landfill**



At the transfer station solid waste will be compacted and loaded into bottles, placed on rail cars and hauled away to Valley View (or some other landfill at about the same distance from Livingston). The rail haul and disposal of solid waste in the bottles will be achieved under a contract with a private company, similar to the current Envirocon contract, under which solid waste is being hauled to Valley View Landfill.

Table 9-A includes owning and operating cost for this scenario. Advantages and disadvantages of this scenario are discussed below.

**Advantages**

- Park County has successfully used this method of transport and disposal of solid waste for the past year. Thus, implementing this scenario will present least obstacles and delays. This scenario will simply require the county to seek long term disposal and tipping fee commitment from Valley View Landfill and a long term contract with appropriate protection built-in the contract to guard against runaway transportation costs.
- This scenario requires the least commitment of capital. No major upgrades or refurbishing of Transfer Station will be needed. Additional bottles may have to be purchased to have a reliable and consistent supply of bottles taking into account bottles in transit.
- If some of the green box sites are upgraded to include proper segregation of MSW from large objects and construction/demolition debris, and the waste is compacted into bottles (similar to Cooke City operations) efficiency in transfer station operations can be realized with associated cost savings. This will further lower the cost per ton shown in Table 9-A, making it an even more attractive alternative from a cost effective stand point.
- This is one of the least cumbersome scenarios from a management and regulatory burden standpoint.
- Improved Waste reduction and recycling, directing more yard (green) wastes to composting will all have a profound impact on the overall cost of implementing this scenario. As an example, just one ton per day reduction in the solid waste shipped via rail road for disposal will save the City/County approximately $10,000 annually in operating costs.
- This scenario will allow the County to continue honoring its 5-year contract with Envirocon and negotiate a longer term contract with the same or another contractor.

## Table 9-A: Cost Analysis of Scenarios A & B

| Action | Scenario A (Incineration) | | | Scenario B (Rail Haul) | | |
|---|---|---|---|---|---|---|
| | Capital | O&M | Capital Recovery | Capital | O&M | Capital Recovery |
| Transfer Station | (1) | $ 350,000.00 | $ - | $ 50,000.00 | $ 685,000.00 | $ 4,700.00 |
| Disposal | $ 5,880,000.00 | $ 900,000.00 | $ 552,720.00 | $ - | $ 675,000.00 | $ - |
| Life Cycle Costs: (2) | | | | | | |
| 5 - year | $ 300,000.00 | | $ 45,000.00 | $ 50,000.00 | | $ 7,500.00 |
| 10 - year | $ 500,000.00 | | $ 24,000.00 | $ 50,000.00 | | $ 2,400.00 |
| 15 - year | $ 300,000.00 | | $ 4,800.00 | $ 50,000.00 | | $ 800.00 |
| Subtotal | $ 6,980,000.00 | $ 1,250,000.00 | $ 626,520.00 | $ 200,000.00 | $ 1,360,000.00 | $ 15,400.00 |
| Annual Owning and Operating Cost | $ | | 1,876,520.00 | $ | | 1,375,400.00 |
| Cost Per Ton (3) | $ | | 125.10 | $ | | 91.69 |

(1) Transfer Station capital cost included in incinerator cost
(2) Interest - 7% per annum
(3) Waste Tonnage - 15,000 T/yr Average During 20-yr Planning Period

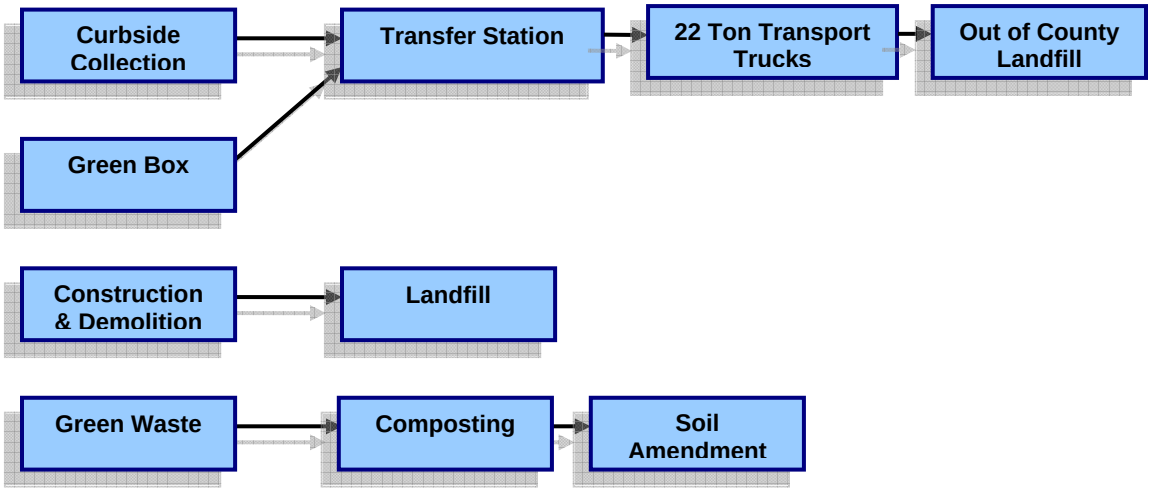
**Disadvantages**

- Escalation of transportation costs and landfill tipping fees may rise beyond control of Park County
- The contractor may suddenly go out of business leaving the county with no option for disposal of solid waste
- The contractor may be acquired by another company (a common trend in today's economy where mergers and acquisitions are commonplace) and under the terms of the purchase, the new owner may not be obligated to honor existing contracts, leaving the County in a vulnerable situation. Under this scenario the County has no direct agreement with the Valley View landfill, and therefore, cannot haul waste to this landfill.
- The out of county landfill may change its policy of accepting out of jurisdiction wastes.
- A major rail road accident along the route to the Valley View Landfill can cripple rail service for several days or weeks. Solid waste cannot be stored for extended periods at the transfer station. This situation will create a major public health problem for the county.

## 9.3 Scenario C - Collection at Curbside Green Box Sites and Truck Haul to Out of County Landfill for Disposal

This scenario is similar to the existing transfer and disposal methods being used by Park County since 2005, except it uses 22 ton capacity long haul trucks owned (to be acquired if this scenario is implemented) by the County to transport solid waste, instead of rail haul under a private contract. This scenario is schematically presented in Figure 9.3-1 below. Under this scenario Solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the unincorporated areas of the County will continue to be collected at green box locations. All City and County solid wastes including commercial wastes, but excluding construction and demolition debris, will be transported to the Transfer Station facility. Construction and demolition waste will continue to be disposed at the existing Park County landfill From the transfer station 22-ton capacity (about 100 CY, 50 ft long) specially designed trailers and trucks will carry solid waste to a landfill within 120 miles from Livingston, for disposal.

## Figure 9.3-1: Scenario C – Truck Haul to Out – of – County Landfill




Under this scenario existing transfer station will have to be reconfigured and re-constructed to allow solid waste from collection vehicles to be deposited into the 22 ton trailers. This will require a bi-level facility whereby the collection vehicles will arrive at the upper level and drop wastes into the trailers located at a lower level.

Opinion of costs related to owning and operating this scenario is included in Table 9-B. Following are advantages and disadvantages of this scenario.

**Advantages**

- This scenario is economically feasible and the cost per ton is comparable (within accuracy of this planning level opinion of cost) to rail haul scenario discussed in Section 9.2.
- This scenario assumes that Park County will enter into a long term disposal contract with a landfill within 120 miles (one way) from Livingston. With this in mind, this scenario provides greater reliability than the rail haul Scenario "B".
- Under this scenario the County maintains full control of operational costs since it will own, operate and maintain the haul trucks.

**Disadvantages**

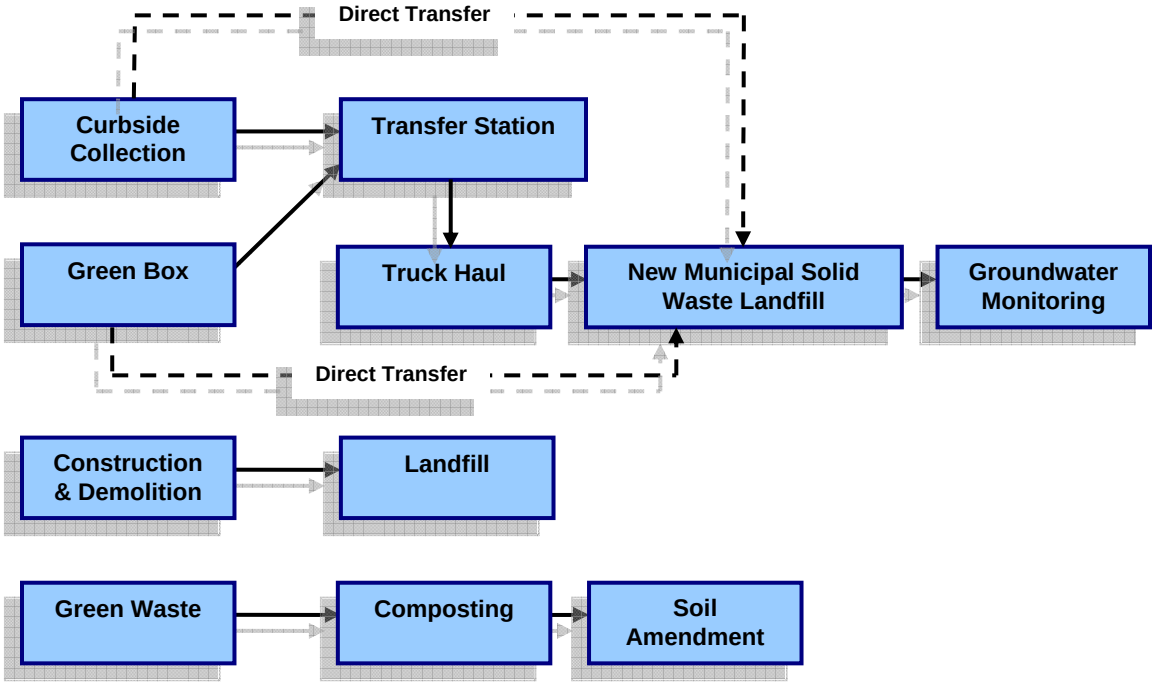
- This scenario requires more management oversight and control, since the transportation is not delegated to a private contractor, such as in the rail haul scenario.

- This scenario requires a large capital investment in reconstructing the transfer station and purchasing trucks
- Transportation to the remote landfill location by truck during inclement weather will be difficult and unsafe.

## 9.4 Scenario D - Collection at Curbside and Green Box Sites and Disposal in a new Park County Landfill

This scenario is schematically presented in Figure 9.4-1 below. Under this scenario Solid waste will continue to be collected curbside by the City from within the municipal limits and from County areas in the vicinity of the municipal boundaries. Solid waste from the unincorporated areas of the County will continue to be collected at green box locations. All City and County solid wastes including commercial wastes, but excluding construction and demolition debris, will be transported to the modified Transfer Station facility. Construction and demolition waste will continue to be disposed at the existing Park County landfill. Under this scenario 22 ton capacity long haul trucks owned (to be acquired if this scenario is implemented) by the County will be used to transport solid waste to a new Park County Landfill.

**Figure 9.4-1: Scenario D – New Park County Landfill**



Similar to Scenario "C", under this scenario, the existing transfer station will have to be reconfigured and reconstructed, and new 22 ton capacity trucks will have to be purchased. However, the County may defer this capital expense for sometime in the future and continue using its present transfer station for loading compacted solid waste in bottles and transporting the bottles to the new landfill, instead of shipping it via rail to an out of county landfill. This is particularly feasible for a short time, if the new landfill can be sited within close proximity to Livingston (say 20 miles or less).

Opinion of costs related to owning and operating this scenario is included in Table 9-B. The advantages and disadvantages of this scenario are discussed below.

**Advantages**

- This scenario is economically feasible provided a suitable site can be identified and permitted for a Subtitle D, Class II Landfill.
- Montana DEQ has permitted several Class II landfill sites throughout the state and its procedures for permitting are well established. This will facilitate review and permitting of a landfill in Park County.
- A new permitted Class II landfill in Park County can solve solid waste disposal problems for 20 to 40 years depending upon the size of the site.
- This scenario offers one of the most reliable methods of solid waste management. Having a permitted landfill within the region where solid waste is generated, offers unmatched flexibility of operations. For example, if the Transfer Station operations are down for a period of time, collection vehicles can be temporarily routed directly to the landfill and the waste can be disposed without creating a nuisance situation in the community.
- Once Park County has a permitted Class II landfill, the potential of attracting solid waste from neighboring communities and commercial establishments (via private solid waste companies) is quite high. If additional solid waste (beyond the 18,000 T/yr projected for the Livingston/Park County area) can be disposed into the new landfill, cost of solid waste disposal to the joint authority can be substantially reduced. For example if an additional 5,000 T/yr solid waste (a fraction of the solid waste generated in Park County) can be brought to the new landfill annually, the cost of transfer and disposal will drop from about $92/T to about $69/T a 25% reduction in cost per ton. Thus, once Park County establishes a Class II landfill, this new facility can be marketed to attract additional wastes.

## Table 9-B: Cost Analysis of Scenarios C & D

| Action | Scenario C (Truck Haul) | | | Scenario D (Landfill) | | |
|---|---|---|---|---|---|---|
| | Capital | O&M | Capital Recovery (2) | Capital | O&M | Capital Recovery |
| Transfer Station | $ 750,000.00 | $ 585,000.00 | $ 70,500.00 | $ 750,000.00 | $ 500,000.00 | $ 70,500.00 |
| Disposal | $ 330,000.00 | $ 709,600.00 | $ 31,020.00 | $ 1,700,000.00 | $ 600,000.00 | $ 159,800.00 |
| Life Cycle Costs: (1) | | | | | | |
| 5 - year | $ - | | $ - | $ - | | $ - |
| 10 - year | $ 200,000.00 | | $ 9,600.00 | $ 1,000,000.00 | | $ 48,000.00 |
| 15 - year | $ - | | $ - | $ - | | $ - |
| Subtotal | $ 1,280,000.00 | $ 1,294,600.00 | $ 111,120.00 | $ 3,450,000.00 | $ 1,100,000.00 | $ 278,300.00 |
| Annual Owning and Operating Cost | $ 1,405,720.00 | | | $ 1,378,300.00 | | |
| Cost Per Ton (2) | $ 93.71 | | | $ 91.89 | | |

(1) Interest - 7% per annum
(2) Waste Tonnage - 15,000 T/yr Average During 20-yr Planning Period

**Disadvantages**

- This scenario does require a significant commitment of capital. However, once invested the amortization and depreciation of the assets is modest.
- This scenario is based on the premise that a suitable landfill site within a 20 mile radius from Livingston can be identified and procured at a reasonable cost. This scenario may not be economically feasible if land costs for the selected site(s) are exorbitant.
- Under this scenario Park County will continue to operate the existing Class II landfill for construction and demolition wastes. This places an additional burden on the county for operating two landfills simultaneously for a modest amount of solid waste generated in the area. If the operations of a construction and demolition debris landfill and the new Class II landfill can be co-located, significant economic advantages can be reaped.
- A new landfill will place additional environmental compliance burden on the county and add financial obligations for closure and post closure costs. This financial burden will be in addition to the environmental obligations for the existing Park County landfill.

### Existing Park County Landfill

The existing Park County landfill is a Montana DEQ permitted Class II landfill. This permit does allow disposal of MSW in this ideally located landfill. However, use of this landfill for MSW disposal is prohibited under the 1981 court decree (**Sundling v. Park County**) (Appendix A). Therefore, this landfill was not considered as one of the disposal scenarios. However, through negotiations and under legal guidance if the court decree can be revisited, this landfill can provide one of the most economical options for solid waste disposal. Use of this landfill may potentially reduce the cost of solid waste disposal to below $50/Ton.

## 9.5 Risk Analysis

A detailed risk analysis is beyond the scope of this plan. However, it is important to be aware of risks associated with each of the scenarios discussed above. For the solid waste disposal scenarios considered in this plan risks were divided in three categories – high, moderate and low. Risks are classified as follows:

- Regulatory Risk – if regulations are subject to frequent and drastic changes it presents a risk in implementing and operating a facility in compliance with the regulations.

- Implementation Risk- Some solid waste scenarios discussed above present implementation risk associated with uncertainty in permitting the facility. For example air emissions standards and ash disposal from a MSW incinerator cannot be determined until a detailed permit application is submitted and approved by DEQ and EPA. Furthermore, operating permit for an incinerator is not granted until initial operation and testing of the facility. Thus, in spite of a major capital investment operation of the incinerator and regulatory burden placed upon the facility remains unknown.
- Operating Risk- Potential of a sudden termination of service, major road or rail road accident, inclement weather etc. present operating risks
- Life Cycle Cost Risk- Due to regulatory and permitting uncertainties, lack of reliable historical cost information and unforeseen operations and maintenance costs add life cycle cost risk to solid waster disposal scenarios

In Table 9-C below the above risks for each of the scenarios are summarized as a quick reference.

## Table 9-C: Risk Analysis of Solid Waste Disposal Scenarios

| Risk | Scenario A | Scenario B | Scenario C | Scenario D |
|---|---|---|---|---|
| **Regulatory Risk** | High | Low | Low | Moderate |
| **Implementation Risk** | High | Low | Low | Moderate |
| **Operating Risk** | Moderate | Moderate | High | Low |
| **Life Cycle Cost Risk** | High | Moderate | Moderate | Low |

# 10 Conclusions and Recommendations

## 10.1 Conclusions

Based on the review of historical information and analysis conducted by the solid waste planning team the following conclusions are drawn:

1. Combined solid waste generated in incorporated and unincorporated areas of Park County is currently about 12,000 TPY. At the end of the 20-year planning period the waste quantities generated from the same region is projected to be about 18,000 TPY. These quantities of solid waste are quite low for absorbing capital and operating costs of solid waste facilities. Thus, the cost per ton of solid waste collection, handling and disposal should be anticipated to be on the high end of the scale for similar facilities.
2. Considering the small quantity of solid wastes generated throughout the planning horizon, it is vital that solid wastes from both Livingston and Park County be combined and facilities be integrated to maximize economies of scale.
3. The sparsely populated and greatly dispersed population centers of Park County present unique challenges to solid waste management in Park County. The citizens of Park County living in outlying areas of the County have come to expect a high quality of solid waste service. The County is currently providing a 24/7 access for county residents to green box locations where solid wastes of all types and any quantity can be disposed. Most of the 17 green box locations provide an easy access to county residents in close proximity to their respective homes. Consolidating some green box locations is essential for cost effective handling of solid waste but, any such change will be viewed by residents as reduction in service.
4. The November 17, 1981 court order **Sundling v. Park County** (Appendix A) placed a moratorium on disposing MSW into the existing Park County landfill. In compliance with the court order the County has used this permitted Class II landfill for disposing only Group III and Group IV wastes. Restrictions placed on the county by the court regarding disposal of MSW have been financially burdensome. However, this matter has not been re-visited with the Plaintiff or the courts for the past 25 years.
5. The recycling and waste diversion efforts have been modest. Small amounts of recyclables in the waste stream and distance from recyclable products market has been a deterrent in improving diversion rates so far. Furthermore, to date there has not been a joint City/County effort to combine the resources of the two entities for improving recycling and waste diversion.

6. In 2005 the County opted to enter into a contract with Envirocon, Inc. a private contractor, to haul solid waste via Montana Rail to an out of county land fill near Helena, MT, approximately 120 miles from Livingston. This option appears to be economically feasible, considering the small amount of waste being generated in Park County. The County has made an investment in construction of a transfer station, procuring equipment for the transfer station and in purchasing rail haul containers (bottles) for compacted waste. Furthermore, the County staff is now trained in the operations of the transfer station and in loading/unloading of bottles and in managing transit impacts and queuing of bottles. The County has entered into a five (5) year contract with Envirocon, Inc. for rail transport and disposal of solid waste. Considering these facts, the present method of solid waste handling and disposal does offer a viable method at least for the short term.

## 10.2 Recommendations

Based on the analysis of various solid waste management scenarios, the following recommendations are offered to the Board of County Commissioners of Park County and the City Commission of the City of Livingston:

1. Complete Current Five – Year Envirocon, Inc. Contract

   There is no compelling reason for terminating this contract prior to its expiration point of August 19, 2009. A full investigation of the long – term disposal options presented in this Plan, along with meeting the implementation steps for the short – term recommendations presented below, will require all the time available during the remaining period for this contract. An investment has already been made in bottles for rail hauling of refuse. The rate being charged for transport and disposal of solid waste under the current contract is reasonable, considering it covers transporting waste over 120 miles one way along with the tipping fee at Valley View Landfill.

2. Consolidation and cooperative efforts between the City of Livingston and Park County are essential and should continue and, in fact, enhanced to maximize the utilization of assets and resources available within these entities. The amount of solid waste generated at the end of the 20-year planning period, in spite of optimistic growth projections for the area, is not sufficient for the City and County to consider independent handling and management of their respective solid wastes.

3. The City of Livingston and Park County is well advised to quickly proceed in the formation of a joint authority (herein called Livingston/Park County Solid Waste Authority) for County-wide solid waste management. This authority should have equitable representation form the City, County and Town of Clyde Park.

4. An evaluation matrix for various scenarios considered for managing solid waste in the region is shown in Table 10.2-A. From this table it is apparent that acquiring a suitable Class II landfill site within a reasonable distance from Livingston (20 miles or so) is the top ranking scenario. However, the present method of rail haul to Valley View Landfill by a private contractor also remains a technically and economically viable scenario. It is recommended that the current method of solid waste handling and disposal be continued at least until the stipulated termination date of the contract. This will allow sufficient time to conduct site selection studies and environmental documentation for seeking a Subtitle D Permit for Class II landfill from Montana DEQ.
5. The Authority should contract with the City of Livingston to provide curbside collection of solid waste in the county areas adjoining the municipal boundaries.
6. The Authority should evaluate merits and economics of operating 17 green box sites and consider consolidation of some sites.
7. Green box sites should be refurbished with compactors and bottle filling arrangements so that the rail haul bottles can be filled and transported directly to rail cars (similar to the operations at Cooke City). 24-hour access to green box sites should be re-evaluated and possibly curtailed so that the sites can be economically manned during operating hours. This will significantly reduce the problems of mixed wastes that have to be sorted inefficiently at the transfer station.

   The following modifications should be made in the operations of the Green Box Sites to make them easier and more efficient to manage while offering a higher level of service. Modifications could include the following:

   - Established days and hours of operation.
   - Elimination of small “green box” dumpsters.
   - Use of roll – off containers and / or compaction units for trash storage as at Cooke City.
   - Partially or fully enclosed building that can be locked.
   - Larger containers for recyclables that are simple to maintain, don’t overflow, and don’t need to be emptied so frequently.
8. Numerous solid waste committees should be consolidated, or terminated in lieu of one advisory committee that reports to the joint authority. This Advisory committee should have a diverse representation from public at large, commercial enterprises (chamber of commerce) and must be representative of the entire community of Park County.

9. A fully or partially enclosed central Recycling and Reuse Center is probably essential to expand materials recovery / recycling in a manner that is operationally efficient. That means minimizing the handling of materials, particularly small quantities; aggregating and storing larger amounts of recyclables; maximizing transport payloads; and selling materials when markets are favorable, not because there is no more storage space. The Center could be situated near the Transfer Station, on land next to the City's Public Works Yard, or at another location where a suitable building already exists. The cardboard baler would be re – located from the Transfer Station to the Recycling and Reuse Center.

   The Center would not be equipped to perform major materials separation or processing functions. Removal of obvious contaminants would be done manually. Initially the Center is designed to accept source separated materials such as from the City's cardboard recycling program, the Headwaters drop – off depots, and residents / businesses bringing materials in. If the City pursues a curbside residential recycling collection program in the future the Center could be modified to process and store those materials.

   A good situation would be to negotiate a service contract with a private recycling company for materials collection, processing, and marketing. The company would provide the necessary equipment while the regional solid waste authority provides the space and building for the Center.

10. The City could consider adoption of a diversion goal and associated timeframe, which upon review, may be revised periodically. Such a policy is not a statutory necessity, but it would demonstrate pro – active leadership and provide formal support for current and future waste reduction / recycling efforts.

11. A small incinerator facility to handle MSW at Cooke City should be considered as an alternative to hauling solid waste through Yellow Stone National Park during inclement weather. Air emission requirements for a small incinerator facility may be exempted making such a facility economically feasible.

12. Court decree of 1981 **(Sundling v. Park County)** (Appendix A) restricting disposal of MSW in the existing permitted Park County Class II landfill should be re-visited under legal guidance and re-negotiated for gaining concessions. If this facility can be re-opened for MSW disposal, it can potentially offer one of the most reliable and economical options for solid waste disposal in Park County.

## Table 10.2-A: Evaluation and Ranking of Alternative Scenarios

| CRITERIA | Scenario A | | Scenario B | | Scenario C | | Scenario D | |
|---|---|---|---|---|---|---|---|---|
| | a | b | a | b | a | b | a | b |
| Capital Outlay (2) | 1 | 2 | 5 | 10 | 3 | 6 | 3 | 6 |
| Cost per Ton (3) | 1 | 3 | 5 | 15 | 5 | 15 | 5 | 15 |
| Reliability (3) | 4 | 12 | 1 | 3 | 4 | 12 | 5 | 15 |
| Regulatory Burden (3) | 3 | 9 | 5 | 15 | 5 | 15 | 3 | 9 |
| Operating Flexibility (2) | 3 | 6 | 2 | 4 | 3 | 6 | 5 | 10 |
| Cost Reduction with Added Waste (1) | 3 | 3 | 1 | 1 | 1 | 1 | 5 | 5 |
| Ease of Implementation (2) | 2 | 4 | 5 | 10 | 4 | 8 | 3 | 6 |
| **Total Score** | **41** | | **58** | | **63** | | **66** | |
| **Ranking** | **4** | | **3** | | **2** | | **1** | |

NOTES:
1. Numbers in parenthesis are weights given to the respective criteria
2. Scoring of each scenario is based on a score of 1-5; 1 is least desirable and 5 is most desirable
3. Column “a” – Score; column “b” – Weighted Score

# Appendix A

## 1981 Court Order, Sundling v. Park County

IN THE DISTRICT COURT

OF THE SIXTH JUDICIAL DISTRICT OF THE STATE OF MONTANA

IN AND FOR THE COUNTY OF PARK

No. 80-7

RAYMOND R. SUNDLING,

Plaintiff,

-vs-

THE COUNTY OF PARK, STATE OF MONTANA, and the BOARD OF COMMISSIONERS OF SAID COUNTY, SAID BOARD CONSISTING OF PETE KNUTSON, KENNETH SPALDING, Chairman, and JAMES TODD,

Defendants.

Filed this 17th day of November A.D. 1981 at 8:30 o'clock A.M.
Emma J. Bowman
Clerk of District Court
Park County, Montana
By _____ Deputy

ORDER

WHEREAS, in the above-entitled action by Order dated March 18, 1980, this Court ordered closure of the Park County landfill on or before June 1, 1980, and

WHEREAS, by order dated May 23, 1980, extension of time to close was granted until July 1, 1980, and

WHEREAS, to this date, the landfill is still in operation, and

IT APPEARING that the plaintiff, RAYMOND SUNDLING, and the defendants have reached an agreement whereby the plaintiff will be compensated for damages suffered and to be suffered from the commencement of landfill operations through and including May 31, 1982.

IT IS HEREBY ORDERED that on June 1, 1982, the defendant will be permanently and mandatorily enjoined from using the landfill at its existing location for disposal of municipal refuse. Any use of the landfill by the defendant after June 1, 1982, will be deemed to be in contempt of this Court order and the Court will impose a daily penalty upon the defendant without the need of further Court hearing.

Civil 80-7
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However, the Court notes that the parties hereto have agreed that the site may be used by the defendant as a Class III landfill which is defined by the State of Montana, Department of Health and Environmental Sciences Bureau of Solid Waste classification, as set out in 16.14.505 A.R.M., where a Class III landfill site is designated as being available for the disposing of solid waste such as, brick, dirt, rock, concrete, wood material, brush, lumber, vehicle tires, inert industrial material wastes and other non-water soluble inert solids. Any use by the Defendant of the site as a Class III waste disposal site shall not be deemed by this Court to be an act in contempt of this order and no daily fine or penalty shall be imposed.

DATED this 16th day of November, 1981.

Honorable Joseph B. Gary
District Judge

COPIES TO: COUNSEL OF RECORD

CIVIL 80-7
FILE 45

IN THE DISTRICT COURT

OF THE SIXTH JUDICIAL DISTRICT OF THE STATE OF MONTANA

IN AND FOR THE COUNTY OF PARK

NO. 80-7

RAYMOND R. SUNDLING,

Plaintiff,

-vs-

THE COUNTY OF PARK, STATE OF MONTANA, and the BOARD OF COMMISSIONERS OF SAID COUNTY, SAID BOARD CONSISTING OF PETE KNUTSON, KENNETH SPALDING, Chairman, and JAMES TODD,

Defendants.

Filed this 17th day of November A. D. 19 81
at 8:30 o'clock A M
Emma Lou Lewis
Clerk of District Court
Park County, Montana
By _____ Deputy

STIPULATION OF SETTLEMENT

Agreement made November 17th 1981, between RAY SUNDLING, herein referred to as Plaintiff and PARK COUNTY, et al, herein referred to as Defendants.

RECITALS

A. Plaintiff has claimed to have suffered property damage as a result of a nuisance created by the Defendant's landfill. Plaintiff, in good faith, contends that the sole cause of the damage to his property and farming business, was Defendant's operation of its sanitary landfill.

B. An action for the recovery of damages for an unspecified sum of money has been filed in the Sixth Judicial District Court of Park County, State of Montana, as civil action No. 80-7, entitled SUNDLING vs PARK COUNTY, et al.

C. The Court, sitting without a jury, found the Defendant's landfill to constitute a nuisance and that the Plaintiff had been damaged. However the Court did not determine damages and instead set a hearing on the issue of damages to be tried to a jury on October 7, 1981.

Film No. 80 7
Frame No. 12

D. The parties are willing to accept a compromise and settlement of the dispute between them.

E. Defendant expects to close the landfill, except as a Class Three landfill, on or before March 31, 1982, and agrees to its closure on or before May 31, 1982.

SECTION ONE

PURPOSE

This agreement is made for the purpose of settling between the parties hereto the claims and differences arising from the incident described above.

SECTION TWO

TERMS OF SETTLEMENT

In consideration of the mutual covenants set forth herein, the parties agree to be bound and obligated as follows:

1. Defendant promises to pay to Plaintiff the sum of Seventeen Thousand Dollars ($17,000.00), to be paid in a reasonable time, but in no event later than December 7, 1981.

2. In addition to the above cash payment the Defendant hereby agrees as follows:

a) To continue to remove rubbish blown from Defendant's landfill from Plaintiff's property on an "as needed" basis during the months of October, November and December of 1981, and January, February, March, April and May of 1982;

b) To have Plaintiff's property cleaned of all refuse blown from Defendant's landfill by May 1, 1982;

c) To clean Plaintiff's main irrigation ditch of silt and landfill refuse; the ditch to be cleaned runs from Plaintiff's house to the ditch's turn-out on the County Poor Farm. Defendant will haul away from Plaintiff's land all landfill refuse taken from the ditch, leaving dirt, silt and natural debris (grasses, etc) piled on the banks of Plaintiff's ditch. In the event, the seperation of natural debris from landfill refuse is impracticable, Defendant agrees to haul away all of said materials to dispose of as

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Defendant sees fit, which disposal shall in no way interfer with Plaintiff's property. The cleaning operation will be completed prior to the date Plaintiff anticipates starting to irrigate his hay fields; Plaintiff agrees to give Defendant reasonable written notice of his anticipated irrigation starting date.

d) The Defendant agrees to pay the Plaintiff daily damage of Twenty-five Dollars ($25.00) for each and every day the landfill stays open beyond April 1, 1982 to June 1, 1982; however, as it is anticipated that the landfill will continue to be used as a Class III landfill site, the penalty will not apply to the Class III landfill operation. The designation Class III is a State of Montana, Department of Health and Environmental Sciences Bureau of Solid Waste classification, as set out in 16.14.505 A.R.M., where a Class III landfill site is designated as being available for the disposing of solid waste such as, brick, dirt, rock, concrete, wood material, brush, lumber, vehicle tires, inert industrial material wastes and other non-water soluble inert solids.

3. Plaintiff states that he has no objection of the Defendant's use of the present landfill site as a Class III landfill.

4. Plaintiff hereby releases and discharges for himself, his legal representatives, successors, and assigns, demands, damages, actions, causes of action, or suits at law or in equity, of any kind or nature, in any manner arising out of the property and losses to business operation suffered by Plaintiff in the above-described Court action, and to damage which might be suffered from wind-blown refuse through May 31, 1982.

However, Plaintiff's claim for fire damage caused by fires which occurred or may occur hereafter as a result of the landfill operation is not included in this settlement and Plaintiff hereby reserves the right to collect whatever insurance proceeds which may be available as a full and complete settlement of Plaintiff's claim

against defendant for said past or future fire damage.

5. Plaintiff agrees to dismiss with prejudice this legal action upon Defendant's completion of the term of this agreement, whether such completion meets with Plaintiff's approval or is settled by arbitration.

SECTION THREE

NO ADMISSION OF LIABILITY

It is understood that Defendant, by agreeing to this compromise and settlement, in no way admits liability to Plaintiff of any kind. Plaintiff understands that Defendant has not agreed or promised to do or omit to do any act or thing no contained in this agreement.

SECTION FOUR

EFFECT OF AGREEMENT

Plaintiff states that no representation of fact or opinion was made to him by Defendant or anyone on Defendant's behalf to induce this compromise as to the extent, nature, or permanency of Plaintiff's damage, or as to the likelihood of future complications. Plaintiff understands this settlement was agreed to as a compromise to avoid expense and to terminate all controversy or claims for injuries or damages of any nature, known or unknown, including future developments thereof, in any way growing out of or in connection with the facts and claims set forth above, and that consideration has been given to the serious and unexpected consequences that might result from the present damage, known or unknown from the landfill operation and nuisance. Plaintiff expressly agrees that his acceptance of the settlement by the Defendant shall be a complete bar to all claims or suits for injuries or damages of any nature resulting or to result from the nuisance and landfill operation (except future fire damage) provided said landfill closes, except as a Class III landfill, by June 1, 1982.

Pltf. 80-7
Frame No. 45

SECTION FIVE

ARBITRATION

The parties to this agreement hereby agree to submit to binding arbitration any disputes or controversies which may arise out of this agreement or the application of the terms thereof. The dispute shall be submitted to the arbitration of three (3) disinterested and competent persons; the Plaintiff choosing one arbitrator, the Defendant choosing one arbitrator and the two (2) arbitrators so selected, choosing a third. The majority decision of the arbitrators shall be conclusive and binding on both parties.

If a dispute or controversy arises, the party so aggrieved shall give written notice to the other of the nature of the grievance and shall request that an arbitrator be selected. The arbitrator shall be selected as soon as possible.

The decision of the arbitrators shall be in writing, signed by the members of the arbitration board and immediately delivered to the parties involved in the dispute.

IN WITNESS WHEREOF, the parties have executed this agreement at Livingston, Park County, Montana, the day and year first above written.

Raymond Sundling - Plaintiff

DEFENDANT'S - BY THE BOARD OF PARK COUNTY COMMISSIONERS

James Todd - Chairman

Pete Knutson

Kenneth Spalding

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Fmr 4/6

I, BONNIE SWANDAL, Attorney for Plaintiff herein, have explained to my client all the terms of this agreement, and he has represented to me that he fully understands all the terms and their significance. He has signed this agreement on my advice.

DATED this 4th day of November, 1981.

Bonnie Swandal
Attorney for Plaintiff

I, BRUCE E. BECKER, Park County Attorney, and as Attorney for the Defendant's have explained to my clients all the terms of this agreement, and they have represented to me that they fully understand all the terms and their significance. They have signed this agreement on my advice.

DATED this 5 day of November, 1981.

Bruce E. Becker
Park County Attorney
Attorney for Defendant's

APPROVAL

The Court hereby approves of the settlement agreed to between the parties and finds the settlement to be fair and just.

DATED this 16th day of November, 1981.

Honorable Joseph B. Gary
District Judge

Civil 80-7
4/7

# Appendix B

## 1996 State of Montana Department of Health Environmental Science v. Park County

9205

Filed this 22nd day of March A.D. 19 96 at 9:37 o'clock A M
JUNE LITTLE
Clerk of District Court
Park County, Montana
By Cheryl John Deputy

Post-it Fax Note | Date 9/30/6 | # of pages 6
To AK - Zia
Fax # 505-538-1587
From Bill Hurley
Phone # 406-222-4106

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Department of Environmental Quality
Legal Division
Helena, Montana 59620-0902
Telephone: (406) 444-2630
Attorney for Plaintiff

Tara DePuy
Park County Attorney
Park County Attorney's office
414 East Callender Street
Livingston, Montana 59047
Telephone: (406) 222-6120
Attorney for Defendants

MONTANA SIXTH JUDICIAL DISTRICT COURT, PARK COUNTY

| | |
|---|---|
| STATE OF MONTANA ex rel. DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES, Plaintiff, v. PARK COUNTY, MONTANA, and PARK COUNTY REFUSE DISPOSAL DISTRICT NO. 1, Defendants. | Civil No. 94-251<br>CONSENT DECREE JUDGMENT AND ORDER |

The Plaintiff, Department of Environmental Quality, formerly the Department of Health and Environmental Sciences (hereinafter "Plaintiff" or "Department"), having commenced this action by filing the Complaint herein; and the Defendants, Park County, Montana, and Park County Refuse Disposal District No.1 (hereinafter "Defendants"), having been duly served with a copy of the Complaint in a manner provided by law; and it appearing to the Court that the parties hereto have stipulated and agreed to the entry of this Consent decree, Judgment, and Order; and the Court

DV. No. 94-251

having jurisdiction of the parties and of the matter in controversy; and being fully advised in the premises;

IT IS HEREBY ORDERED, ADJUDGED AND DECREED AS FOLLOWS:

1. The Plaintiff is a department of the executive branch of government, duly created and existing under the laws of the State of Montana (Section 2-15-2101, MCA).

2. The Defendant Park County ("Park County" or "Defendant") is a political subdivision of the State of Montana possessing powers as specified in Title 7, Chapter 1, Part 21, MCA.

3. The Defendant Park County Refuse Disposal District No. 1 ("Refuse District" or "Defendant") is a solid waste management district created and controlled by Park County pursuant to Title 7, Chapter 13, Part 2, MCA. The Refuse District was created for the purpose of collection and/or disposal of solid waste within the District.

4. For the purposes of this Consent Decree, the District Court of the Sixth Judicial District of the State of Montana, in and for Park County has jurisdiction over the subject matter of this action and over the parties to this action.

5. The Complaint filed in this action alleged that Defendants have violated certain conditions in an air quality permit (Permit #1629) issued for the Refuse District municipal waste incinerator (hereinafter "Incinerator"), as well as certain provisions in the New Source performance



DV NO. 94-251
EXHIBIT NO. 11

Standards promulgated by the U.S. Environmental Protection Agency (EPA). The Complaint sought assessment of a civil penalty and an Order requiring Defendants to comply with the requirements of Permit #1629 and applicable regulations.

6. Subsequent to the filing of this action, Defendants implemented certain modifications to the manner in which the Incinerator is operated. Compliance tests, performed in November of 1995, demonstrated that the Defendants' modifications to the Incinerator operation have corrected the permit and regulatory violations that were the basis for Plaintiff's Complaint.

7. In settlement of this action, Defendants agree, so long as the Incinerator continues to operate, to operate the Incinerator in accordance with the terms of Permit #1629 and the following specific modifications:

a. A minimum temperature of 1500 degrees Fahrenheit shall be maintained in the secondary combustion chamber while incinerating municipal waste. A temperature recorder shall be installed for the purpose of recording the secondary combustion chamber temperature;

b. A static pressure of negative 0.1 to negative 0.5 inches of water shall be maintained across the primary combustion chamber. A pressure gauge shall be installed to measure the pressure differential across the primary combustion chamber; and

c. Defendants shall maintain on the premises of the Incinerator a record of daily charging rates, hours of operation, secondary combustion chamber temperatures, and primary combustion chamber static pressure.

DV NO. 94-251

8. Defendants agree to apply to the Department, within thirty (30) days of the issuance of this Consent Decree, Judgment, and Order, for a modification of Permit #1629 to incorporate the modifications stated in Paragraph 7 above. Defendants agree to comply with the terms of Permit #1629 as modified.

9. In settlement of this action, the Defendants have also paid to the Department a civil penalty in the amount of Ten Thousand Dollars ($10,000), receipt of which is hereby acknowledged by the Department.

10. Nothing contained in this Consent Decree, Judgment and Order shall be deemed to waive or limit the obligations of Defendant to comply with all applicable environmental laws and regulations; nor is this document intended in any way to limit the right of the Department to institute any proceeding, administrative or judicial, against Defendant for subsequent violations of any applicable environmental law, regulation, permit or order.

11. This Consent Decree, Judgment and Order shall apply to, and be binding upon each of the parties, its agents, employees, successors in interest and assigns. The undersigned representatives of the respective parties certify that they are fully authorized by the party or parties whom they represent to enter into the terms and conditions of this Consent Decree, to execute this Consent Decree and to legally bind that party or parties.



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12. The parties hereby agree to the entry of this Consent Decree, Judgment and Order as more fully appears from their signatures appended hereto.

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

BY: _____
Mark A. Simonich
Director

DATE: 3/19/96.

BY: _____
Legal Counsel

DATE: 3/19/96

PARK COUNTY, MONTANA

BY: _____

DATE: 3/8/96

BY: _____
Legal Counsel

DATE: 3/8/96

PARK COUNTY REFUSE DISPOSAL DISTRICT NO. 1

BY: _____

DATE: 3/8/96

BY: _____
Legal Counsel

DATE: 3/8/96

ORDER AND JUDGMENT

THIS MATTER having come before the Court upon the parties' request for entry of this Consent Decree, Judgment and Order, and the Court having fully reviewed this matter, it is hereby

FOUND that the terms and provisions of this Consent Decree in their entirety represent a fair, reasonable, and



DV. NO. 94-251
lll

equitable settlement of all matters and it is therefore

ORDERED that the foregoing terms and conditions are adopted by the Court and made an Order and Judgment of this Court.

DATED this 22nd day of March, 1996.

District Judge



DV. NO. 94-251
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# Appendix C

## 2000 US Census Bureau Population Fact Sheet for Livingston and Park County, Montana


FACT SHEET

## Livingston city, Montana

**Census 2000 Demographic Profile Highlights:**

| General Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Total population | 6,851 | | | map | brief |
| Male | 3,337 | 48.7 | 49.1% | map | brief |
| Female | 3,514 | 51.3 | 50.9% | map | brief |
| Median age (years) | 40.3 | (X) | 35.3 | map | brief |
| Under 5 years | 381 | 5.6 | 6.8% | map | |
| 18 years and over | 5,295 | 77.3 | 74.3% | | |
| 65 years and over | 1,272 | 18.6 | 12.4% | map | brief |
| One race | 6,767 | 98.8 | 97.6% | | |
| White | 6,604 | 96.4 | 75.1% | map | brief |
| Black or African American | 21 | 0.3 | 12.3% | map | brief |
| American Indian and Alaska Native | 67 | 1.0 | 0.9% | map | brief |
| Asian | 34 | 0.5 | 3.6% | map | brief |
| Native Hawaiian and Other Pacific Islander | 0 | 0.0 | 0.1% | map | brief |
| Some other race | 41 | 0.6 | 5.5% | map | |
| Two or more races | 84 | 1.2 | 2.4% | map | brief |
| Hispanic or Latino (of any race) | 148 | 2.2 | 12.5% | map | brief |
| Household population | 6,672 | 97.4 | 97.2% | map | brief |
| Group quarters population | 179 | 2.6 | 2.8% | map | |
| Average household size | 2.16 | (X) | 2.59 | map | brief |
| Average family size | 2.86 | (X) | 3.14 | map | |
| Total housing units | 3,360 | | | map | |
| Occupied housing units | 3,084 | 91.8 | 91.0% | | brief |
| Owner-occupied housing units | 1,870 | 60.6 | 66.2% | map | |
| Renter-occupied housing units | 1,214 | 39.4 | 33.8% | map | brief |
| Vacant housing units | 276 | 8.2 | 9.0% | map | |

| Social Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Population 25 years and over | 4,773 | | | | |
| High school graduate or higher | 4,057 | 85.0 | 80.4% | map | brief |
| Bachelor's degree or higher | 956 | 20.0 | 24.4% | map | |
| Civilian veterans (civilian population 18 years and over) | 763 | 14.4 | 12.7% | map | brief |
| Disability status (population 5 years and over) | 1,448 | 22.4 | 19.3% | map | brief |
| Foreign born | 138 | 2.0 | 11.1% | map | brief |
| Male, Now married, except separated (population 15 years and over) | 1,538 | 57.0 | 56.7% | | brief |
| Female, Now married, except separated (population 15 years and over) | 1,510 | 52.0 | 52.1% | | brief |
| Speak a language other than English at home (population 5 years and over) | 161 | 2.5 | 17.9% | map | brief |

| Economic Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| In labor force (population 16 years and over) | 3,599 | 65.2 | 63.9% | | brief |
| Mean travel time to work in minutes (workers 16 years and over) | 19.1 | (X) | 25.5 | map | brief |
| Median household income in 1999 (dollars) | 28,980 | (X) | 41,994 | map | |
| Median family income in 1999 (dollars) | 40,505 | (X) | 50,046 | map | |
| Per capita income in 1999 (dollars) | 16,636 | (X) | 21,587 | map | |
| Families below poverty level | 97 | 5.6 | 9.2% | map | brief |
| Individuals below poverty level | 831 | 12.1 | 12.4% | map | |

| Housing Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Single-family owner-occupied homes | 1,626 | | | | brief |
| Median value (dollars) | 87,500 | (X) | 119,600 | map | brief |
| Median of selected monthly owner costs | (X) | (X) | | | brief |

U.S. Census Bureau
American FactFinder

FACT SHEET

## Park County, Montana

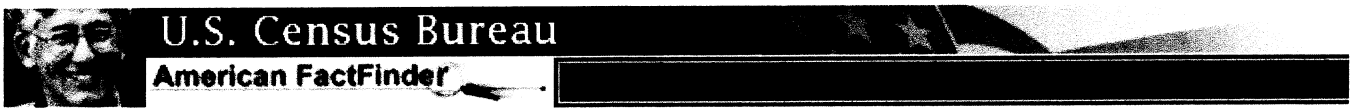
**Census 2000 Demographic Profile Highlights:**

| General Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Total population | 15,694 | | | map | brief |
| Male | 7,745 | 49.4 | 49.1% | map | brief |
| Female | 7,949 | 50.6 | 50.9% | map | brief |
| Median age (years) | 40.6 | (X) | 35.3 | map | brief |
| Under 5 years | 904 | 5.8 | 6.8% | map | |
| 18 years and over | 11,999 | 76.5 | 74.3% | | |
| 65 years and over | 2,336 | 14.9 | 12.4% | map | brief |
| One race | 15,511 | 98.8 | 97.6% | | |
| White | 15,168 | 96.6 | 75.1% | map | brief |
| Black or African American | 63 | 0.4 | 12.3% | map | brief |
| American Indian and Alaska Native | 145 | 0.9 | 0.9% | map | brief |
| Asian | 56 | 0.4 | 3.6% | map | brief |
| Native Hawaiian and Other Pacific Islander | 5 | 0.0 | 0.1% | map | brief |
| Some other race | 74 | 0.5 | 5.5% | map | |
| Two or more races | 183 | 1.2 | 2.4% | map | brief |
| Hispanic or Latino (of any race) | 288 | 1.8 | 12.5% | map | brief |
| Household population | 15,480 | 98.6 | 97.2% | map | brief |
| Group quarters population | 214 | 1.4 | 2.8% | map | |
| Average household size | 2.27 | (X) | 2.59 | map | brief |
| Average family size | 2.88 | (X) | 3.14 | map | |
| Total housing units | 8,247 | | | map | |
| Occupied housing units | 6,828 | 82.8 | 91.0% | | brief |
| Owner-occupied housing units | 4,536 | 66.4 | 66.2% | map | |
| Renter-occupied housing units | 2,292 | 33.6 | 33.8% | map | brief |
| Vacant housing units | 1,419 | 17.2 | 9.0% | map | |

| Social Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Population 25 years and over | 11,013 | | | | |
| High school graduate or higher | 9,645 | 87.6 | 80.4% | map | brief |
| Bachelor's degree or higher | 2,542 | 23.1 | 24.4% | map | |
| Civilian veterans (civilian population 18 years and over) | 1,826 | 15.2 | 12.7% | map | brief |
| Disability status (population 5 years and over) | 2,757 | 18.8 | 19.3% | map | brief |
| Foreign born | 418 | 2.7 | 11.1% | map | brief |
| Male, Now married, except separated (population 15 years and over) | 3,750 | 60.4 | 56.7% | | brief |
| Female, Now married, except separated (population 15 years and over) | 3,787 | 58.5 | 52.1% | | brief |
| Speak a language other than English at home (population 5 years and over) | 489 | 3.3 | 17.9% | map | brief |

| Economic Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| In labor force (population 16 years and over) | 8,279 | 66.4 | 63.9% | | brief |
| Mean travel time to work in minutes (workers 16 years and over) | 21.3 | (X) | 25.5 | map | brief |
| Median household income in 1999 (dollars) | 31,739 | (X) | 41,994 | map | |
| Median family income in 1999 (dollars) | 40,561 | (X) | 50,046 | map | |
| Per capita income in 1999 (dollars) | 17,704 | (X) | 21,587 | map | |
| Families below poverty level | 304 | 7.2 | 9.2% | map | brief |
| Individuals below poverty level | 1,780 | 11.4 | 12.4% | map | |

| Housing Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Single-family owner-occupied homes | 2,701 | | | | brief |
| Median value (dollars) | 97,900 | (X) | 119,600 | map | brief |
| Median of selected monthly owner costs | (X) | (X) | | | brief |




GCT-H5. **General Housing Characteristics: 2000**
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data
Geographic Area: **Park County, Montana -- County Subdivision and Place**

NOTE: For information on confidentiality protection, nonsampling error, definitions, and count corrections see http://factfinder.census.gov/home/en/datanotes/expsf1u.htm.

| Geographic area | Total housing units | Occupied housing units | Vacant housing units | | | | Vacancy rate | |
|---|---|---|---|---|---|---|---|---|
| | | | | Percent | | | | |
| | | | Total | For sale only | For rent | Seas., rec., or occ. use | Home-owner | Rental |
| **Park County** | 8,247 | 6,828 | 1,419 | 7.4 | 13.0 | 55.9 | 2.3 | 7.4 |
| **COUNTY SUBDIVISION AND PLACE** | | | | | | | | |
| Gardiner-Cooke City CCD | 1,299 | 866 | 433 | 4.2 | 8.8 | 71.4 | 3.6 | 8.9 |
| Cooke City-Silver Gate CDP | 247 | 79 | 168 | 2.4 | 0.0 | 91.1 | 8.0 | 0.0 |
| Gardiner CDP | 497 | 435 | 62 | 12.9 | 17.7 | 35.5 | 3.3 | 5.1 |
| Remainder of Gardiner-Cooke City CCD | 555 | 352 | 203 | 3.0 | 13.3 | 66.0 | 2.9 | 15.0 |
| Shields Valley CCD | 906 | 748 | 158 | 8.2 | 7.6 | 49.4 | 2.3 | 6.1 |
| Clyde Park town | 157 | 137 | 20 | 25.0 | 25.0 | 10.0 | 4.6 | 13.2 |
| Wilsall CDP | 119 | 102 | 17 | 23.5 | 11.8 | 35.3 | 4.8 | 8.3 |
| Remainder of Shields Valley CCD | 630 | 509 | 121 | 3.3 | 4.1 | 57.9 | 1.0 | 3.7 |
| Upper Yellowstone Valley CCD | 6,042 | 5,214 | 828 | 8.9 | 16.2 | 49.0 | 2.1 | 7.2 |
| Livingston city | 3,360 | 3,084 | 276 | 12.7 | 34.8 | 10.1 | 1.8 | 7.3 |
| Remainder of Upper Yellowstone Valley CCD | 2,682 | 2,130 | 552 | 7.1 | 6.9 | 68.5 | 2.3 | 7.0 |
| **PLACE** | | | | | | | | |
| Clyde Park town | 157 | 137 | 20 | 25.0 | 25.0 | 10.0 | 4.6 | 13.2 |
| Cooke City-Silver Gate CDP | 247 | 79 | 168 | 2.4 | 0.0 | 91.1 | 8.0 | 0.0 |
| Gardiner CDP | 497 | 435 | 62 | 12.9 | 17.7 | 35.5 | 3.3 | 5.1 |
| Livingston city | 3,360 | 3,084 | 276 | 12.7 | 34.8 | 10.1 | 1.8 | 7.3 |
| Wilsall CDP | 119 | 102 | 17 | 23.5 | 11.8 | 35.3 | 4.8 | 8.3 |

(X) Not applicable
Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices H1, H3, H4, and H5.

# Appendix D

## 2000 – 2025 Population Projection for Livingston and Park County, Montana

## Table 2.4-A: Population Projections

| Year | Livingston Population | Unincorporated County Population | Total Population |
|---|---|---|---|
| 2005 | 7,062 | 8,906 | 15,968 |
| 2006 | 7,401 | 9,333 | 16,734 |
| 2007 | 7,756 | 9,781 | 17,538 |
| 2008 | 8,129 | 10,251 | 18,380 |
| 2009 | 8,519 | 10,743 | 19,262 |
| 2010 | 8,646 | 10,904 | 19,551 |
| 2011 | 8,776 | 11,068 | 19,844 |
| 2012 | 8,908 | 11,234 | 20,142 |
| 2013 | 9,041 | 11,402 | 20,444 |
| 2014 | 9,177 | 11,573 | 20,750 |
| 2015 | 9,315 | 11,747 | 21,062 |
| 2016 | 9,454 | 11,923 | 21,378 |
| 2017 | 9,596 | 12,102 | 21,698 |
| 2018 | 9,740 | 12,284 | 22,024 |
| 2019 | 9,886 | 12,468 | 22,354 |
| 2020 | 10,035 | 12,655 | 22,689 |
| 2021 | 10,185 | 12,845 | 23,030 |
| 2022 | 10,338 | 13,037 | 23,375 |
| 2023 | 10,493 | 13,233 | 23,726 |
| 2024 | 10,650 | 13,431 | 24,082 |
| 2025 | 10,810 | 13,633 | 24,443 |

# Appendix E

## Reference Guide for Map of Montana Waste Disposal Facilities

| Reference Guide for Map of Montana Waste Disposal Facilities | | | | |
|---|---|---|---|---|
| **Location** | **Facility Name** | **County** | **Approx. Miles from Livingston** | **Inside Radius?** |
| 1. Livingston | Not applicable | Park | --- | --- |
| 2. Billings | City of Billings Landfill | Yellowstone | 110 | Yes |
| 3. Bozeman | Bozeman City Landfill | Gallatin | 25 | Yes |
| 4. Logan | Logan Landfill District #1 | Gallatin | 50 | Yes |
| 5. Butte | Butte Silver Bow Government | Silver Bow | 100 | Yes |
| 6. Townsend | Broadwater County Transfer Station | Broadwater | 70 | Yes |
| 7a. Helena | City Sanitation Service Landfill & Helena Transfer Station | Lewis & Clark | 110 | Yes |
| 7b. Helena | Lewis & Clark County Landfill | Lewis & Clark | 110 | Yes |
| 7c. East Helena | Valley View Landfil | Jefferson | 120 | Yes |
| 8. West Yellowstone | West Yellowstone Transfer Station | Gallatin | 115 | Yes |
| 9. Dillon | Beaverhead County Landfill | Beaverhead | 130 | No |
| 10. Deer Lodge | Deer Lodge Disposal District | Powell | 130 | No |
| 11. Corvallis | Victor Transfer Station | Ravalli | 200 | No |
| 12. Missoula | BFI Missoula Landfill | Missoula | 200 | No |
| 13. Polson | Lake County Landfill | Lake | 240 | No |
| 14. Kalispell | Flathead County Solid Waste | Flathead | 280 | No |
| 15. Libby | Libby Class II Landfill | Lincoln | 330 | No |
| 16. Great Falls | High Plains Sanitary Landfill Site 1 | Cascade | 150 | No |
| 17. Conrad | Northern Montana Joint Refuse District Class II | Pondera | 210 | No |
| 18. Shelby | City of Shelby Class II Landfill | Toole | 240 | No |
| 19. Chester | Town of Chester Landfill | Liberty | 230 | No |
| 20. Havre | Unified Disposal District Class II Landfill | Hill | 230 | No |

| Reference Guide for Map of Montana Waste Disposal Facilities | | | | |
|---|---|---|---|---|
| **Location** | **Location** | **Location** | **Location** | **Location** |
| 21. Malta | City of Malta Class II Landfill | Phillips | 250 | No |
| 22. Glasgow | Valley County Refuse District #1 Class II Landfill | Valley | 280 | No |
| 23. Scobey | Daniels County Landfill | Daniels | 350 | No |
| 24. Plentywood | Plentywood Landfill | Sheridan | 380 | No |
| 25. Wolf Point | Wolf Point City Landfill | Roosevelt | 310 | No |
| 26. Sidney | Richland County Class II Landfill | Richland | 350 | No |
| 27. Glendive | City of Glendive Class II Landfill | Dawson | 310 | No |
| 28. Baker | Coral Creek Landfill | Fallon | 320 | No |
| 29. Miles City | Miles City Area Solid Waste Disposal District | Custer | 240 | No |
| 30. Broadus | Powder River County Class II Landfill | Powder River | 260 | No |
| 31. Hardin | City of Hardin Class II Landfill | Big Horn | 150 | No |
| 32. Forsyth | Rosebud County Class II Landfill | Rosebud | 200 | No |
| 33. Roundup | Musselshell County Refuse District Transfer Station | Musselshell | 130 | No |
| 34. Lewiston | Fergus County Regional Transfer Facility | Fergus | 130 | No |