



**Gartner
Lee**

Solid Waste Strategy

Prepared for
Yukon Government

Prepared by:
Gartner Lee Limited

GLL 21-919

September 2001

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September 19, 2001

Yukon Government
2071 Second Avenue
Whitehorse, YT
Y1A 1B2

Attention: Mr. Art Dell

Dear Mr. Dell,

Re: Solid Waste Strategy

We are pleased to submit the final version of the Solid Waste Strategy. This document provides Community and Transportation Services with recommendations for the management of your existing solid waste management facilities, as well as long-range options for the future of waste management in the rural areas.

We have enjoyed working on this project and working with you, Georgi MacStephen and David Albisser. We trust that you find the report to be an effective tool for future planning exercises.

Sincerely,
GARTNER LEE LIMITED

Maura Walker
Senior Planner

Table of Contents

| | Page |
|--|-------------|
| 1. Introduction | 1 |
| 2. Methodology | 2 |
| 3. Objectives | 2 |
| 4. Existing Waste Management System | 3 |
| 4.1 Disposal..... | 3 |
| 4.2 Waste Diversion..... | 5 |
| 4.3 Household Hazardous Waste and Special Waste..... | 6 |
| 4.4 Policy and Planning | 6 |
| 4.5 Legislation..... | 8 |
| 4.6 Financing and Budget | 9 |
| 5. Issues | 9 |
| 5.1 Material Management | 9 |
| 5.2 Site Management..... | 10 |
| 5.2.1 Operational Issues | 12 |
| 5.2.2 Maintenance Issues | 12 |
| 5.3 Financial Management..... | 14 |
| 5.3.1 Problem Site Users..... | 14 |
| 5.3.2 Cost Recovery | 14 |
| 5.3.3 Financial Reporting and Budgeting | 14 |
| 5.3.4 Diversion Costs | 14 |
| 5.4 Regulations and Guidelines | 15 |
| 5.5 Communication and Education | 15 |
| 5.5.1 Site Users | 15 |
| 5.5.2 Stakeholders | 15 |
| 6. Solid Waste Strategy | 17 |
| 6.1 Short Term Strategy | 17 |
| 6.1.1 Material Management: | 17 |
| 6.1.2 Site Management..... | 21 |
| 6.1.3 Financial Management..... | 21 |
| 6.1.4 Communication and Education | 23 |
| 6.2 Long Term Solid Waste Management Strategy | 24 |
| 6.2.1 Rationale for Regionalization | 25 |
| 6.2.2 Transferring Waste to Regional Facilities | 25 |
| 6.2.3 Amalgamation of Southern Yukon Sites – Haines Junction to Whitehorse and Southern Lakes Area Sites..... | 26 |
| 6.2.4 Other Regionalization Opportunities | 30 |
| 6.2.5 Yukon Regulations/Policies..... | 31 |
| 6.2.6 Public Consultation..... | 32 |
| 6.3 Summary of Recommendations | 32 |
| 7. References | 35 |

List of Tables

| | | |
|----------|-----------------------------------|----|
| Table 1. | Material Management..... | 18 |
| Table 2. | Site Management | 21 |
| Table 3. | Financial Management | 22 |
| Table 4. | Communication and Education | 23 |
| Table 5. | Capital Costs..... | 27 |
| Table 6. | Operating Costs (Annual)..... | 28 |

List of Figures

Follows Page

| | | |
|-----------|--|---|
| Figure 1. | Map of the Solid Waste Disposal Sites in the Yukon | 3 |
|-----------|--|---|

Appendices

| | |
|-------------|--|
| Appendix A. | Project Contacts |
| Appendix B. | Objectives for the Solid Waste Management Strategy |
| Appendix C. | Solid Waste Facilities Information |
| Appendix D. | Haines Junction Bylaw that Prohibits Burning of Refuse |
| Appendix E. | Information re: Charge Up to Recycle |
| Appendix F. | Photo of Tub Grinder |
| Appendix G. | Photos of sites visited by the Project Team on CD-ROM |

1. Introduction

The purpose of this Solid Waste Strategy is to provide a framework for the development of solid waste management plans for Community and Transportation Services (C&TS) disposal facilities. Solid waste management plans must be developed for each of C&TS sites by January 2002 as a requirement of the Yukon Government's Environment Act.

The development of the plans affords C&TS the opportunity to review their operations and consider means to improve efficiencies, environmental protection and cost-effectiveness. This strategy is the first step in that review.

The strategy provides recommendations for both the short and long terms. The short-term recommendations reflect on current operations and how they could be enhanced. The long-term recommendations provide options for the future of C&TS solid waste operations.

The strategy is organized in the following manner:

- Section 1** Provides an introduction to the strategy, describes the strategy's purpose and outlines the contents of the report.
- Section 2** Provides an overview of the methodology employed in developing the strategy.
- Section 3** Lists the objectives employed in the consideration of the strategy.
- Section 4** Provides an overview of the existing waste management system in the Yukon, including roles, responsibilities and legislation. Also included in this section is the C&TS budget to operate the solid waste facilities.
- Section 5** Provides a description of the issues associated with the current operation of the solid waste management facilities, including challenges associated with handling certain material streams, site management, financing, regulations and communications.
- Section 6** Provides recommendations to address the issues described in Section 3, including the consideration of a long-term plan to regionalize the C&TS operations.
- Section 7** Provides a summary table of the recommendations and suggests a possible timeframe for implementation.

2. Methodology

The development of the strategy involved the following components:

- a review of existing data and legislation associated with solid waste management in the Yukon;
- visits to a limited number of C&TS solid waste management sites;
- visits to a limited number of municipal solid waste management sites;
- interviews with stakeholders, including municipal staff, waste industry representatives and Yukon Government staff; and
- contact with equipment suppliers to determine product applicability and costs.

The site visits and interviews were used to identify current and anticipated issues with solid waste management in the Yukon. These visits and interviews also served as an opportunity to explore ideas for the future. Appendix A provides a list of the people contacted.

3. Objectives

To initiate the development of the strategy, the project team drafted a list of objectives to be addressed by the strategy. This list was reviewed by C&TS staff at a meeting on May 31, 2001 and was determined to reflect the needs of C&TS. The objectives of the solid waste strategy are:

1. *Protect human and environmental health*
 - Locate solid waste management facilities in the most environmentally and socially appropriate places;
 - Reduce risk to wildlife;
 - Reduce air emissions;
 - Reduce impacts on ground and surface waters;
 - Reduce fire hazard risk;
 - Reduce litter; and
 - Reduce waste generation rates by 50% of 2001 rates.
2. *Minimize Costs*
 - Cost effective waste management; and
 - Implement effective cost recovery mechanisms where possible
3. *Address Public and Stakeholder Needs*
 - Public/Community inclusion in the design of the Yukon solid waste management system;
 - An informed public/community;
 - Public acceptability of the Solid Waste Strategy; and
 - Understanding and participation in proper solid waste management by all stakeholders.

4. *Be sustainable*

- Increase waste diversion;
- Increase recycling opportunities; and
- Ensure all residents and businesses in the Yukon have access to environmentally and socially acceptable waste management.

C&TS can use these objectives as guidelines for the development of the solid waste management plans. The plans should attempt to fulfill as many of the objectives as practical during the plan's timeframe.

A full report on the objectives that includes the rationale for each of the objectives can be found in Appendix B.

4. Existing Waste Management System

The operation of C&TS' solid waste management facilities is impacted by several external influences, such as the available recycling and disposal infrastructure, regulations, policies and budget. This section provides a brief overview of the existing waste management system in the Yukon, focusing on the following areas:

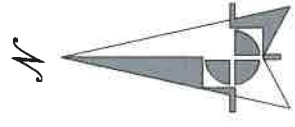
- disposal
- waste diversion
- household hazardous waste management
- policy and planning
- legislation
- budgets and financing

This is not an exhaustive review of all activities, but intended only to provide a picture of how external influences affect C&TS.

4.1 Disposal

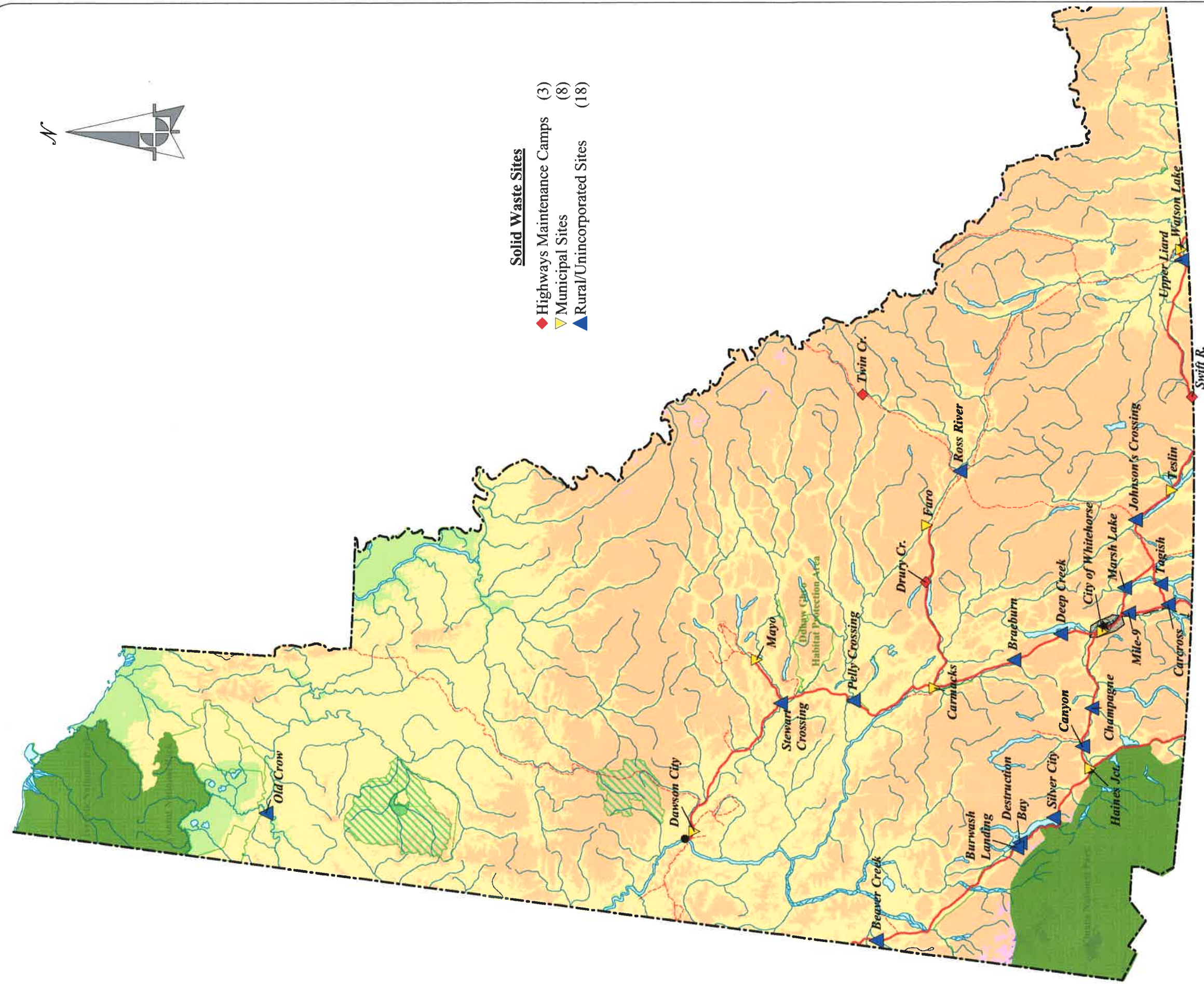
In the Yukon, disposal facilities are operated by the municipalities for incorporated areas (eight sites) and by the C&TS of the Yukon Government for the unincorporated areas (19 sites). Generally, people living outside of but close to a municipal facility will use the municipal site. The Yukon Government Highway Maintenance Camps also operate small-scale disposal facilities located on the camp site. Figure 1 shows the location of the disposal sites and Appendix C provides details on these sites.

Disposal sites are generally "trench-and-burn" operations, with the exception of Mount Lorne (a C&TS site) and Whitehorse, Dawson City and Haines Junction (municipal sites). Typically, domestic waste is deposited in a trench and burned once per week. Burnt residue is compacted and covered with a soil or gravel material as required (see Photo 1).



Solid Waste Sites

- ◆ Highways Maintenance Camps (3)
- ▼ Municipal Sites (8)
- ▲ Rural/Unincorporated Sites (18)



Scale: 1:3,500,000

Site Name: YUKON TERRITORY
File Name: 21919-F1.WOR



Engineering & Development Branch

**Government of Yukon
Solid Waste Strategy
Yukon Solid Waste Sites**

Project No. 21-919
Date Issued: SEPT. 2001

Figure 1



Photo 1. Canyon Creek Trench and Fencing

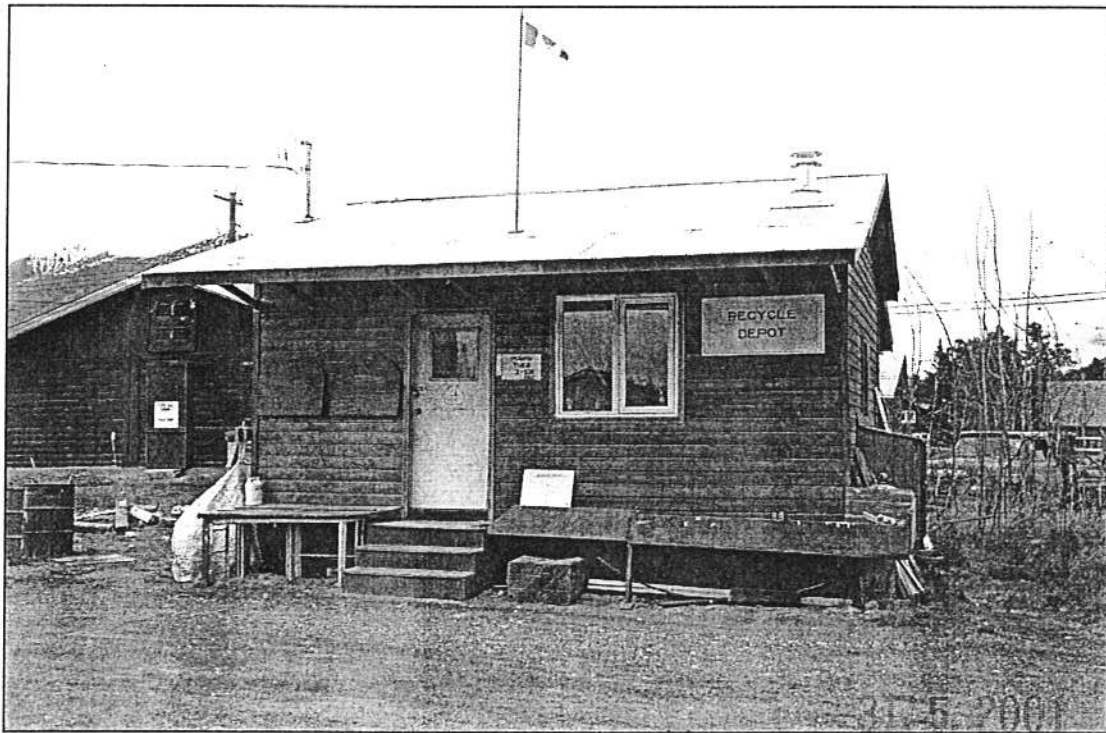


Photo 2. Carcross Recycling Depot

Mount Lorne and Whitehorse do not burn any solid waste materials and all domestic waste is landfilled. Dawson City does not burn domestic solid waste with the exception of cardboard. Haines Junction has passed a bylaw to prohibit the burning of solid waste and is working towards the elimination of burning at their site (Appendix D).

The burning of brush and construction/demolition (CD) waste is still practiced at all sites except at Whitehorse.

4.2 Waste Diversion

At C&TS waste facilities, there are diversion options for scrap metal, lead-acid batteries and white goods. Scrap metal is removed for recycling through a recycling contractor. Most of the C&TS sites are serviced by a contractor less than once per year on an as-required basis.

Construction and demolition (CD) waste is segregated from the domestic refuse. This waste is typically subject to scavenging, although C&TS does not sanction this activity. The segregated CD waste is burned, where allowed, and buried on site.

Composting of yard waste is not occurring at C&TS sites. At some municipal sites (e.g. Whitehorse and Haines Junction), yard waste is composted. Some communities interviewed for this project, such as Dawson City, indicated an interest in starting a composting program. Composting may be particularly attractive to a community because this diversion activity can be managed by municipal staff or a contractor and does not require transportation or rely on recycling market infrastructure.

Recycling of household wastes such as newspapers, cardboard, glass and tin cans is limited in the Yukon. In Whitehorse, recycling is available to residents through drop-off depots. In other communities, recycling for residents is typically provided by local recycling societies, although the range of materials collected varies by community and is generally more restricted than what is provided in Whitehorse. See Photo 2 on the previous page. At a minimum, the recycling societies take back beverage containers included in the beverage container deposit-refund system. All recyclable materials from the communities are transferred to Raven Recycling for processing and marketing. Commercial generators can also use the recycling drop off centres.

Commercial collection of recyclable materials is available in Whitehorse through Raven Recycling and P&M Recycling.

Recycling in Yukon is challenged by the distance to recycling markets which are located in British Columbia and Alberta. Fortunately, there are numerous “backhaul” opportunities that can be accessed for discounted transportation of the materials to the marketplace. The more remote communities in

Yukon face greater challenges to recycling as backhaul opportunities are less plentiful and it may take several months or years to store up enough material to make transportation viable.

4.3 Household Hazardous Waste and Special Waste

Household hazardous waste (HHW) and special waste are not allowed in the domestic solid waste disposal stream as required by the solid waste permits. Consequently, communities are provided with an opportunity to dispose of their HHW through an annual mobile collection program managed by the Renewable Resource Department of the Yukon Government. Collection opportunities for these materials are infrequent and Renewable Resources staff estimates that only 2% of the quantity of material being generated is captured.

Local collection events (e.g. Household Hazardous Waste Day) are often organized by the local recycling society.

Some disposal facilities, such as Mount Lorne and Haines Junction allow some domestic HHW materials to be diverted from landfilling or burning by having a storage area for source-separated hazardous materials. These facilities provide a year-round option for generators to properly dispose of these materials. Mount Lorne is the only C&TS site to offer collection of HHW (see Photo 3).

Industrial, commercial and institutional (IC&I) generators of special waste are responsible for proper disposal of this waste and must arrange pick-up of these materials with Renewable Resources.

Once the hazardous wastes are gathered, Renewable Resources takes care of transporting collected waste to treatment locations, but treatment and disposal costs are to be paid by the local community, C&TS or the IC&I generator.

Lead-acid batteries are an exception to HHW as they can be deposited for recycling at most disposal facilities. These batteries have an established recycling infrastructure and are not handled through the regular HHW collection system (see photo 4).

4.4 Policy and Planning

Solid waste management policy and planning is the jurisdiction of the Renewable Resources Department of the Yukon Government. They are responsible for Territory-wide programs such as the beverage container deposit-refund system, stewardship programs, removal of ozone-depleting substances from white goods, standards and permits for disposal facilities and hazardous and special waste management. They hold all of the disposal and air emission permits for the C&TS sites. They also oversee the solid waste management plans that must be completed for each disposal facility in Yukon by January 2002.

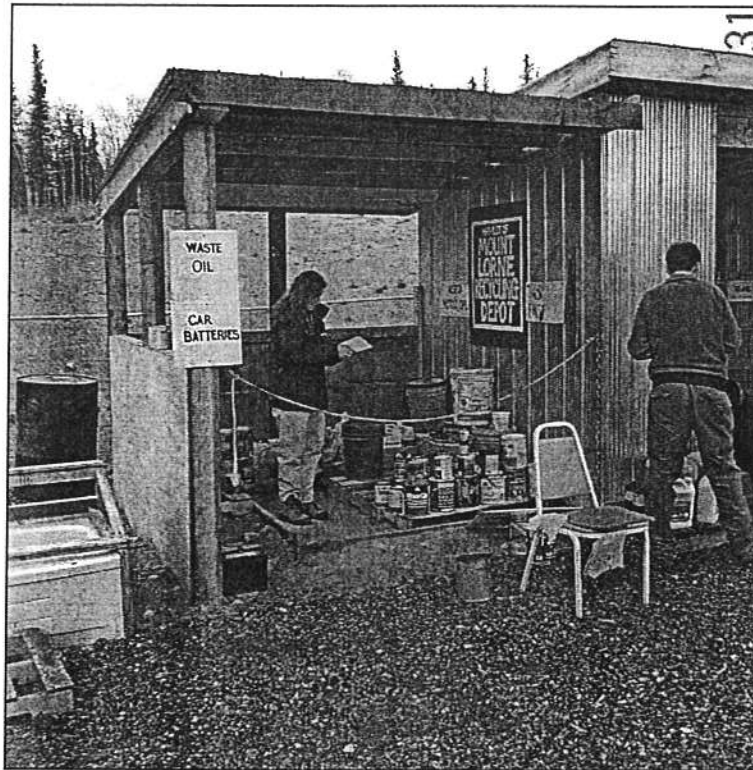


Photo 3 Mile 9 – Household Hazardous Waste Shed



Photo 4. Champagne Site – Battery Pile

4.5 Legislation

There are several pieces of legislation that impact solid waste management in the Yukon and the operation of the C&TS disposal sites. The legislation includes:

- *Environment Act* – provides solid waste management definitions, states how solid waste shall be disposed, defines which facilities require permits, requires solid waste management plans and sets out the operating standards for disposal facilities (“dumps”);
- *Solid Waste Regulations* – requires solid waste management plans for each solid waste facility in the Yukon to be prepared by January 2002. These plans must address wildlife control and HHW collection;
- *Air Emissions Regulations* – requires a permit for the open burning of solid waste in amounts greater than 5 kg per day and sets the conditions of the permits;
- *Forest Protection Act* – requires that burn operations are not conducted in a manner that threatens forest land;
- *Yukon Wildlife Act* – prohibits disposal of garbage any way which would make it available to wildlife;
- *Special Waste Regulations* – defines household special wastes and special waste and the requirements for obtaining special waste permits and transportation certificates;
- *Public Health and Safety Act* - requires that disposal sites be operated in a manner that protects human health and safety such that every site must be located 100 yards away from roadways, 500 yards away from buildings and situated so that no pollution of water sources occurs;
- *Occupational Health Regulations* – provides instructions for the handling of asbestos at disposal facilities;
- *Beverage Container Regulations* – requires a deposit to be placed on all beverage containers sold in the Yukon (with the exception of dairy products) and the containers be returned for a refund by the consumer with the intent of having the container recycled;
- *Highways Act* – requires that disposal facilities operate at least 50 metres from a highway;
- *Territorial Lands Act* – regulates the use of land for waste disposal sites;
- *Yukon Waters Act* – regulates the deposit of wastes into surface and groundwaters; and
- *Canadian Environmental Protection Act* – regulates the disposal of toxic substances.

4.6 Financing and Budget

The operation of C&TS solid waste facilities is funded solely by the Operation and Maintenance (O&M) funds provided by the Yukon Government. There is no cost recovery function applied to the use of the territorial dumps, such as tipping fees or user rates. The one exception is the Mile 9 facility, as it receives some of its operating revenues from the Mt. Lorne Garbage Management Society by virtue of the Beverage Container Recycling Program. The funds provided by the society are applied towards staffing of the site. (Note: The Mile 9 facility is the only C&TS facility that is staffed and operated under restricted hours of access.)

In 2000, expenditures for O&M were \$161,000. Not considering the Mile 9 site with an expenditure of \$42,500, the range of expenditures for each site was from \$0 to \$19,000, with an average expenditure of \$6,600. O&M expenditures covered the cost of litter clean-up, supervised burning of the refuse, and covering and compacting waste in the trenches.

Capital costs in 2000 for each site, ranged from \$0 to \$32,000. Capital expenditures include major site work (such as a new trench), fencing, power installation, maintenance of a 30 metre fire buffer, metal clean up and lead acid battery clean up.

In the municipalities, the funding of their solid waste management function is generally done through tax requisition. The Whitehorse facility has weigh scales, so it is able to charge a user fee correlated to the amount of waste brought in. This is the only solid waste facility in the Yukon operating in this manner.

5. Issues

This section describes the issues associated with the current operation of the C&TS solid waste management facilities and provides the basis for the recommendations provided in Section 6. The issues have been grouped into challenges associated with waste materials, site management, financial management, regulations and communication.

5.1 Material Management

The waste stream received at the C&TS sites is quite diverse; it includes household refuse, commercial refuse, construction and demolition debris, yard waste, grubbing waste, old car hulks, lead-acid batteries, tires, old appliances (white goods), scrap metal, household hazardous waste, and oil drums. Each material component of the waste stream requires consideration of how it should be best managed; e.g., Should it be burned? Recycled? Salvaged? Composted? Does it require special handling?

The following is a list of specific material streams and the challenges currently being experienced in the management of these materials:

- *Scrap metal* – may take a long time to accumulate enough volume to justify removal, collected infrequently, removal done on a site-by-site contract basis which can be expensive for C&TS and does not provide contractors with much financial stability to be able to access processing equipment. At some sites, the scrap metal appears that it is being placed in the domestic refuse trench (e.g. Marsh Lake), see Photo 5;
- *Household hazardous waste (HHW)* – infrequent collection opportunities, collection often relies on the interest of the local recycling society, most HHW is disposed of as domestic wastes, can be a danger to site users, workers and the environment if burned (e.g. an explosion at the Carmacks site injured site maintenance staff), must be addressed in solid waste management plans, collected HHW must be safely stored until it can be transported to proper disposal location, an expensive waste stream to manage effectively;
- *Construction and demolition waste* – requires substantial storage space, often the pile is contaminated (contains regular refuse), potential fire hazard; when inert waste is buried in trenches it takes up valuable space;
- *Grubbing Waste* – potential fire hazard when large volume is accumulated;
- *Appliances containing Ozone Depleting Substances (ODS)* – although an ODS-removal contractor services the sites on an annual basis with funding from Renewable Resources, the appliances are not stored to ensure that ODS is contained (see Photo 6), territorial regulations require that ODS not be released into the atmosphere;
- *Oil and chemical drums* – not a domestic waste product but still arriving at site, generally not stored properly (potential to leak and pollute the site), high cost to generator to dispose properly, should not be kept at site as it encourages other drums to be dropped off; and
- *Tires* – hard to access recycling opportunities (limited markets and expensive), potential fire hazard when volumes are accumulated.

5.2 Site Management

Site management refers to the operation and maintenance of the solid waste sites. Operational challenges noted during the site visits were limited to the issues related to the open burning of refuse and uncontrolled access. Maintenance challenges included use of cover material, litter, wildlife fencing and monitoring.



Photo 5. Marsh Lake - Trench

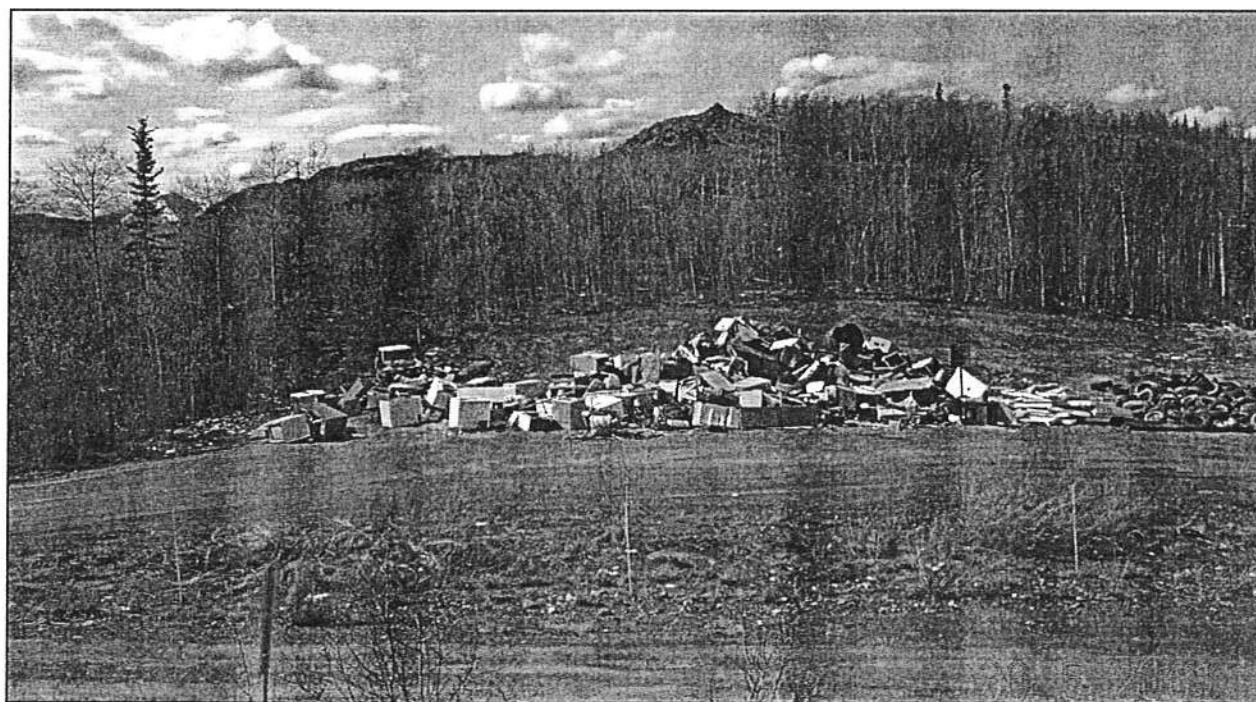


Photo 6. Deep Creek Scrap Metal Pile – Appliances on Side

5.2.1 Operational Issues

The burning of refuse is a long-standing solid waste management method in Yukon. However, recently there has become an awareness of the possible risks associated with this practice, including safety risks of workers and site users, fire risk to forest lands and private property, and health risks through the release of toxic elements into the air. Some communities in the Yukon, namely Whitehorse, Dawson City and Haines Junction have stopped burning domestic refuse as a result of these concerns. The long-term acceptability of burning as a means to dispose of garbage is in question, especially at sites located near residences.

The viability of moving to a no-burn operation would have to address the fact that the C&TS sites were not sized for no-burn type of operation. The elimination of burning would significantly shorten the life span of the sites and increase operation and maintenance costs.

The other major operational is unlimited, unmonitored access to the all of the sites have by users (with the exception of Mile 9). This situation makes waste segregation, control over the type of waste placed in the trench, cleanliness and waste reduction extremely challenging. Without on-site staff, there is little opportunity for direct education of site users or opportunity to minimize site abuse such as the deposit of hazardous materials.

5.2.2 Maintenance Issues

- *Use of cover material* – During the site visits, the availability and use of cover material at most sites were apparent; however, at other sites cover material was not apparent on the site (Carcross) or it was there but not being used (Deep Creek, Marsh Lake). See Photo 5 on the previous page.
- *Litter* – Due to wind and birds, litter in and around the sites can be an issue, especially if the litter fence surrounding the trench is too low. This problem was noted at Braeburn and Carcross. At Braeburn in particular, the surrounding forest land was strewn with plastic litter and required substantial clean-up by the site contractor. See Photo 7. Most sites receive litter clean-up infrequently (1-2 times per year); however, the larger sites (e.g. Carcross, Marsh Lake, Tagish) receive weekly litter pick-up and twice annual major clean-ups.
- *Wildlife fencing* – Electric fencing is in place at many C&TS sites but was not “live” at all the sites visited. Other sites do not have wildlife fencing but are expected to in the near future to meet the requirements of their permit. This type of fencing requires regular site maintenance (e.g. litter removal and weed control) to ensure that it operates effectively. A site user reported that residents living near the Champagne site are concerned that the fencing (when it is in place) will redirect wildlife towards the homes.

Solid Waste Strategy - Yukon Government

- *Water Quality Monitoring* – With the exception of the three sites required under their permit to conduct monitoring, C&TS sites does not monitor ground and surface water quality near the solid waste sites. Because the waste is in trenches, contamination (if it existed) would not be readily visible and could leach into the ground below. The potential for contamination is greater at sites where access is not controlled and the type and source of waste being deposited are not necessarily known. The Yukon Government is liable for any water contamination that can be traced to the operation of the solid waste sites.



Photo 7. Deep Creek – Trench – No Cover

5.3 Financial Management

Financial management issues occur when existing budgets do not meet the current O&M needs of the solid waste facilities or when there are unforeseen solid waste management expenditures that cannot be accommodated within the existing financial framework.

5.3.1 Problem Site Users

“Problem site users” refers to unanticipated users of the C&TS solid waste facilities that have an impact on the operating budget of the facility. Examples of problem site users includes large CD projects, such as the school that was demolished and the materials left at the Ross River site, and a highway construction project leaving waste materials at Beaver Creek. Another type of example is people living within the City of Whitehorse using the Marsh Lake disposal site. They may be using the site to avoid the tipping fees at the Whitehorse landfill, or because of its proximity to their residence or business. The volumes that problem site users generate means additional, unplanned operating costs to manage the material and additional capital costs as the trenches fill up faster than expected and require replacement.

5.3.2 Cost Recovery

Financing of C&TS solid waste management facilities is provided from general Yukon Government revenues. There is no cost recovery function available to C&TS to cover additional servicing, enhanced environmental protection, staffing, recycling or HHW management.

5.3.3 Financial Reporting and Budgeting

Given the limited budgets, the C&TS sites appear to operate effectively. Staff is to be commended for making the monies available for operation, maintenance and capital projects go as far as they do. However, due to financial constraints, the sites do not receive frequent enough servicing to ensure that they are not an environmental or social hazard. Continued operation of the sites in this manner could pose a long-term risk to the Yukon Government.

5.3.4 Diversion Costs

The cost to recycle waste materials currently collected at the C&TS sites is substantial. This is due to several reasons: the remoteness of many of the sites, the lack of local recycling markets, and the lack of staffing to ensure cleanliness of segregated materials and the lack of volumes (associated with small populations). In addition, the recycling industry which services the sites typically cannot make large capital cost investments in equipment that would increase recycling efficiencies because long-term service contracts or access to low-interest funding are not available. The lack of ideal equipment increases the cost to remove the recyclables from the sites. Recycling initiatives are further challenged when the cost to burn recyclable materials is compared directly to the cost of recycling without accounting for the less quantifiable environmental benefits.

5.4 Regulations and Guidelines

Regulations and guidelines have a significant influence on how solid waste management is conducted in Yukon as they set minimum standards and expectations. In 1989, the Canadian Council of Ministers of the Environment (CCME) passed a resolution to reduce solid waste by 50%. This goal was, in turn, adopted by most provinces in Canada. In the Yukon, however, this goal was not included in the Environment Act or subsequent bills. The current legislation and guidelines regarding solid waste management do not address waste diversion requirements. The solid waste management planning guidelines only ask that waste diversion activities, existing or planned, be described in the Plan. There is no prescriptive measure for plans to include a waste diversion component. Currently, waste diversion activities are done on a voluntary basis and vary substantially from community to community. Without minimum waste diversion requirements, it is difficult for the recycling industry to invest in the Yukon as no economies of scale can be achieved.

5.5 Communication and Education

In the context of this report, communication is the sharing of information and education is the provision of information. Currently, C&TS is not involved in any formal communication or education mechanisms related to solid waste management and consequently may be missing opportunities to share with other solid waste stakeholders as well as their constituents (the site users).

5.5.1 Site Users

All of the C&TS solid waste management sites, with the exception of Mile 9, are unstaffed facilities. Users are left on their own to use the site in the proper manner and deposit materials in the appropriate locations on site. Proper usage is encouraged solely through use of signs posted on the site. The current signage indicates the type of material that can be left at a specific location, such as the sign shown in Photo 8, but does not provide a description of what is and is not included within that material category, nor how the material should be stored on site. The result in many instances is segregated materials contaminated with other waste products (see Photo 9) or materials are stored such that they release harmful products into the environment. At most of the sites visited by the project team, refrigerators and freezers were stored on their sides or piled up such that the pipes containing ODS were punctured and the ODS was allowed to escape. At the Marsh Lake site, oil drums stored on their side leaked remnant oil into the ground below.

5.5.2 Stakeholders

At present there is no regular communication forum for solid waste managers in Yukon. There are many common issues and solutions that could be discussed, such as financing, regulatory requirements, recycling, public perceptions and education.



Photo 8. Marsh Lake – Battery Pile



Photo 9. Carcross Segregated Piles – Metal Contaminated with Refuse

6. Solid Waste Strategy

The Solid Waste Strategy contains a series of recommendations for C&TS consideration. The recommendations are organized into two sections:

- i. Short-term Strategy – These recommendations are directed towards measures to improve the current operation of the C&TS sites and are intended for implementation within a one to two year timeframe. They assume the status quo number of sites and the “trench-and-burn” method of waste disposal.
- ii. Long-term Strategy – These recommendations are measures that require significant capital investment, or systemic changes in the way solid waste management is conducted by C&TS such as moving away from burning as a method of disposal to transferring waste to a central landfill site. Many measures listed in the long-range strategy will require planning and additional research before they can be properly implemented.

6.1 Short Term Strategy

The short-term strategy was developed based on conditions observed during site visits and conversations with various stakeholders. The recommendations are means to improve existing operating conditions to ensure environmental and human health are protected. In many cases, the recommendations are a means to reduce operating costs.

6.1.1 Material Management:

Although the primary objective of the site is to provide facilities for the disposal of domestic waste, at each of the C&TS sites there are several different waste streams being managed. The evolution of regulations as well as public needs and expectations has resulted in sites that must separately manage domestic waste, CD waste, grubbing waste, ODS-containing appliances, scrap metal, lead-acid batteries and auto hulks. The material streams addressed in the short-term strategy are:

- scrap metal
- household hazardous waste (HHW)
- construction/demolition waste (CD)
- grubbing waste
- appliances containing ODS
- tires

Table 1 provides specific recommendations for the improved management of the above-noted materials.

Table 1. Material Management

| RECOMMENDATIONS | RATIONALE |
|---|--|
| SCRAP METAL | |
| <ul style="list-style-type: none"> Consider means to allow controlled scavenging such as creating “Reuse” areas. | <ul style="list-style-type: none"> Promotes waste diversion. Saves capital and operating costs |
| <ul style="list-style-type: none"> Except in very remote locations (e.g. Old Crow), metal should not be buried and recycling options should be included in the management plan for all C&TS sites. | <ul style="list-style-type: none"> Extends the life of the trench and site. Supports environmental objectives. |
| <ul style="list-style-type: none"> The next request for bids for scrap metal recycling contract should be for several or all sites to encourage economies of scale. Consider providing the opportunity for municipalities to “piggyback” on the request for bidding process. | <ul style="list-style-type: none"> With the larger contracts, contractors can access, lease or purchase equipment to make the scrap removal and recycling process more efficient. |
| <ul style="list-style-type: none"> Have scrap metal removal conducted during the spring and summer when the ground is driest and the daylight is long. | <ul style="list-style-type: none"> Sites can be more easily serviced, thereby keeping the cost of the contract lower. |
| <ul style="list-style-type: none"> At sites that have scrap metal collection, encourage site users to not place metal in the trenches. | <ul style="list-style-type: none"> Maximizes the life of the trenches. |
| HHW | |
| <ul style="list-style-type: none"> Encourage Renewable Resources to embark on a HHW generator education program. Such an education program could focus on not generating HHW (“use it up”), proper disposal and, existing opportunities for collection (through drop-off depots and retailers, e.g. “Charge Up to Recycle” return to retail program for rechargeable batteries¹). | <ul style="list-style-type: none"> Minimizes the hazardous substances in the domestic waste stream, thereby reducing environmental risks and worker risk (exposure to chemical constituents when waste is burned). Reduces the financial burden on the whole waste management system by minimizing the quantity of HHW generated. |
| <ul style="list-style-type: none"> Increase collection opportunities for domestic generators. This could be done by assisting local recycling societies provide year-round collection or encouraging Renewable Resources to provide additional collection services/funding for HHW transport and disposal. | <ul style="list-style-type: none"> Minimizes the hazardous substances in the domestic waste stream thereby reducing environmental risks and worker risk. |
| <ul style="list-style-type: none"> The Yukon Government should consider providing local Recycling Societies and/or disposal facilities with proper storage and containment equipment and training for the management of HHW deposited at these facilities. | <ul style="list-style-type: none"> Ensures environmental, public and worker safety. |
| <ul style="list-style-type: none"> Consider implementing disposal bans on HHW. | <ul style="list-style-type: none"> Emphasizes the importance of not placing HHW in the domestic waste stream. |

¹ For additional information on “Charge Up to Recycle,” refer to the Appendix E.

Table 1. Material Management (continued)

| RECOMMENDATIONS | RATIONALE |
|--|---|
| CD WASTE | |
| <ul style="list-style-type: none"> Do not discourage appropriate scavenging. Consider a specific area where potentially reusable material can be set aside. | <ul style="list-style-type: none"> Reuse of waste materials extends the useful life of products and materials and the life of the disposal site life. A specific area for reusable materials may serve to keep the site tidier and increase scavenger safety. |
| <ul style="list-style-type: none"> Encourage clean segregation of materials into wood products, clean fill, metal products and other. Clean wood waste can be chipped or reused, metal can be recycled and other waste products can be treated as regular refuse. | <ul style="list-style-type: none"> Management options for waste materials are greater for clean waste streams. |
| <ul style="list-style-type: none"> Have site contractor keep the CD waste pile(s) clean of domestic refuse and other contaminants. | <ul style="list-style-type: none"> Clean material piles reinforce to site users what materials are placed in what area. Contaminated piles reduce the viability of reuse or recycling and if contaminated with regular refuse, could pose a safety threat due to the potential to attract wildlife. |
| CD WASTE | |
| <ul style="list-style-type: none"> Grind segregated wood products (other than creosoted wood) and make chip available for community use. Unused chips can be land applied. Consider the merits of acquiring and sharing the use of an industrial tub grinder to be used for grinding both CD materials and brush.² A photo of a tub grinder is available in Appendix F. Capital and operating costs can be seen in the footnote on this page. | <ul style="list-style-type: none"> Chipping of wood waste reduces volumes, (thereby reducing storage space needs and the risk of fire), makes a usable product, and eliminates the need for burning (thereby reducing air pollution). If acquired in collaboration with other governments (municipalities and Renewable Resources), such a machine could have a significant impact on the volume of waste being disposed in the Yukon. |
| GRUBBING WASTE | |
| <ul style="list-style-type: none"> Grind branches along with CD wood waste (limited to 6" or less in diameter). | <ul style="list-style-type: none"> As above. |

² The total capital cost (exclusive of taxes) for an industrial tub grinder equipped with grapple loader (F.O.B. Whitehorse) is \$340,000.00. This equipment can be leased for under \$7000.00 per month (exclusive of taxes) on a 5 year lease purchase agreement (\$0.00 buyout after 60 payments). Total O&M costs per hour quoted (based on 1500 hours/year) are \$83.00/hour. Initial discussions with the City of Whitehorse suggest that they are interested in exploring some common arrangement in this regard. Cost sharing opportunities should be discussed with interested organizations.

Table 1. Material Management (continued)

| RECOMMENDATIONS | RATIONALE |
|--|---|
| APPLIANCES CONTAINING ODS | |
| <ul style="list-style-type: none"> • Improve signage to tell users how ODS-containing appliances should be left. List the type of appliances that contain ODS e.g. "Deposit Refrigerators, Freezers & Air Conditioners Here. Place Units Upright On The Ground" | <ul style="list-style-type: none"> • ODS-containing appliances left on their side or back are more likely to leak ODS. |
| <ul style="list-style-type: none"> • Have site contractors keep appliances upright until ODS can be removed. Do not pile the appliances until the ODS has been removed. | <ul style="list-style-type: none"> • Piling of appliances can cause appliances to leak ODS. Piling also damages the appliances making them less attractive for salvage and repair. |
| <ul style="list-style-type: none"> • Require site users to remove the doors from refrigerators and freezers. Include door removal in the site maintenance contracts. | <ul style="list-style-type: none"> • This common safety measure minimizes the risk of a child becoming trapped inside of a unit and suffocating. |
| TIRES | |
| <ul style="list-style-type: none"> • Support the recently drafted tire stewardship plan. | <ul style="list-style-type: none"> • Stewardship programs place most of the burden of proper tire disposal on the generator of the product. The draft tire stewardship program encourages generators to bring tires to disposal sites and funds the removal and recycling of the tires. The financial burden to manage this waste stream (with the exception of providing storage space) would no longer be borne by C&TS or the municipalities and would be funded instead by tire users. |

6.1.2 Site Management

Site management recommendations for the short-term (Table 2) address operation and maintenance issues such as the use of cover material, litter, wildlife fencing and monitoring. The larger issues such as the type of disposal employed are addressed in the long-term strategy.

Table 2. Site Management

| RECOMMENDATIONS | RATIONALE |
|---|--|
| <ul style="list-style-type: none"> • More frequent servicing to keep sites tidy and safe. | <ul style="list-style-type: none"> • Promotes proper site usage and is less likely to result in negative environmental impacts. |
| <ul style="list-style-type: none"> • Reinforce with site contractors the requirement for regular use of cover material. Consider modifications to contract requirements to emphasize this aspect of the operation. | <ul style="list-style-type: none"> • Meet conditions of permit |
| <ul style="list-style-type: none"> • Provide litter fencing at least 3 metres high around domestic waste trenches. | <ul style="list-style-type: none"> • Minimizes the amount of wind-blown litter on and around the site and reduces site clean-up costs. |
| <ul style="list-style-type: none"> • Continue to install and maintain electric fencing around sites. | <ul style="list-style-type: none"> • Meet conditions of solid waste permits, minimizes impact of garbage on wildlife and reduces the likelihood of human-wildlife conflicts. |
| <ul style="list-style-type: none"> • Implement groundwater and surface water monitoring. Aside from the sites where monitoring is required by permit, monitoring of additional sites should be considered on a priority basis. Priority should be given to sites that may pose greater risk to ground and surface waters by their proximity to water and/or people and their annual volumes, such as Marsh Lake. | <ul style="list-style-type: none"> • Because the sites are uncontrolled, it is not known what waste is deposited in the trenches. In addition, a substantial quantity of domestic refuse contains heavy metals and other toxic components (e.g. batteries, pesticides, and electronics). YTG assumes some risk of liability if water is found to be contaminated. |
| <ul style="list-style-type: none"> • Grade sites so that precipitation drains away from the trenches. | <ul style="list-style-type: none"> • Decreases risk of surface and ground water contamination. |

6.1.3 Financial Management

Financial management recommendations for the short-term strategy (Table 3) focus on increasing budgets to better manage the C&TS solid waste management system and stabilizing expenditures to allow for better financial planning.

Table 3. Financial Management

| RECOMMENDATIONS | RATIONALE |
|---|--|
| LARGE GENERATORS | |
| <ul style="list-style-type: none"> • Provide on-site signage regarding usage of the site (i.e. not for large generators of waste unless previously approved in writing by C&TS) | <ul style="list-style-type: none"> • Minimizes incidents of misuse. Assists in stabilizing O&M expenditures. |
| <ul style="list-style-type: none"> • Contact potential generators through municipalities, developers, institutions and contractors to inform them of proper disposal locations and restrictions | <ul style="list-style-type: none"> • Minimizes incidents. Assists in stabilizing O&M expenditures. |
| <ul style="list-style-type: none"> • Identify regional disposal sites for inert waste | <ul style="list-style-type: none"> • Saves space at domestic waste sites. |
| EXTERNAL USERS | |
| <ul style="list-style-type: none"> • Consider limiting access through a card-lock system at locations of high external usage such as Marsh Lake | <ul style="list-style-type: none"> • May help to stabilize and minimize operation and maintenance costs. Extends life of trench and site. |
| FINANCIAL CONSTRAINTS | |
| <ul style="list-style-type: none"> • Increase O&M budget to accommodate more frequent site maintenance. | <ul style="list-style-type: none"> • More frequent servicing of the sites provides a higher level of environmental, user and worker safety. |
| <ul style="list-style-type: none"> • Implement Rural Services Policy | <ul style="list-style-type: none"> • Provides an opportunity for cost recovery. |
| CONTRACTORS | |
| <ul style="list-style-type: none"> • Look for opportunities to amalgamate site servicing contracts to allow contractors to incorporate some economies of scale. e.g. Contract out the scrap metal removal for all C&TS sites needing service within the fiscal year. | <ul style="list-style-type: none"> • Amalgamation of service contracts should result in cost savings for YTG. Larger contracts give contractors the financial security to mobilize equipment/staff to get the job done easier and quicker. |
| <ul style="list-style-type: none"> • Consider asking municipalities if they would like to partner in contracting. | <ul style="list-style-type: none"> • Partnering in service contracts should result in cost savings to YTG and participating municipalities. In some cases, partnering may result in a large enough contract to attract bidders that would not be interested in small jobs or could not afford to mobilize for small jobs. |

6.1.4 Communication and Education

The short-term recommendations for communication and education in Table 4 relate to improved site signage and more communication with site users and solid waste management stakeholders.

Table 4. Communication and Education

| RECOMMENDATIONS | RATIONALE |
|---|--|
| <ul style="list-style-type: none"> Improve signage at the sites to provide more information on how and where to dispose of specific wastes on site. | <ul style="list-style-type: none"> Signage is the primary tool for communicating to site users on how to use the solid waste management facility. Effective signage reduces contamination and should serve to decrease maintenance costs. |
| <ul style="list-style-type: none"> Develop a handout to be picked up at the site informing reader about how to use the site and answering common solid waste management questions. Also consider distributing a regular Newsletter to the users of the sites. | <ul style="list-style-type: none"> To encourage proper use of the C&TS site and local recycling opportunities, people need to be informed of how and where to bring certain materials. A brochure can be available year-round for new residents or for those that need a “refresher” on the do’s and don’ts of the site. A regular information newsletter can keep users informed of changes to the site operation, problems that site users can assist in resolving, new recycling opportunities and waste reduction ideas. |
| <ul style="list-style-type: none"> Establish an on-going stakeholder committee to address solid waste management issues across the Yukon and identify opportunities to share expertise and resources. This committee would include representatives of municipalities, First Nations, the private waste management industry, recycling societies and Renewable Resources. | <ul style="list-style-type: none"> Early identification of issues and opportunities could lead to savings in operations, maintenance and capital costs, as well as increase recycling opportunities. Items that could be addressed by a stakeholder committee include: <ul style="list-style-type: none"> - Additional stewardship programs - Yukon-wide collection of recyclable materials - Common communication and education needs - Regional sites for inert CD waste disposal - Identification of upcoming large waste generating project - The potential of composting (pilot projects, training, operating standards) - Sharing equipment - Amalgamating contracting needs |

6.2 Long Term Solid Waste Management Strategy

The low population densities and large distances between communities in Yukon has led to the creation of numerous small refuse disposal sites as people are generally unwilling to transport their garbage long distances. Community & Transportation Services' current Solid Waste Management Guidelines & Procedures (1996) provide for the creation of waste disposal facilities to serve rural populated areas consisting of:

“at least fifteen permanent (year-round residency) family units in separate dwellings; or at least six permanent (year-round residency) family units plus at least one major commercial or institutional user; all located within a circle six kilometres in diameter or located along a common transportation corridor where the maximum distance between the two outermost units is no greater than 25 kilometres and where it is deemed in the public interest to provide a waste disposal facility.”

Given the foregoing, there are currently in existence 26 dumpsites and a number of highways maintenance camp disposal sites across Yukon, serving a population of approximately 35,000. The City of Whitehorse is reported to receive in the order of 22,500 tonnes per year, or on an average 62 tonnes/day. The incorporated community sites (other than Whitehorse) receive approximately 2.6 tonnes per day per site on average and the unincorporated sites less than 0.5 tonnes per day per site.

In recent years there has been a significant move nationally towards the development of regional or co-operative waste disposal systems with neighboring communities sharing a common landfill. The combined population makes it possible to keep the per capita cost to a minimum for a maximum quality of service and reduced environmental impacts. Given the demographics in Yukon, however, opportunities to achieve economies of scale through regionalization are difficult. Regionalization would however, have a significant impact on reducing the potential environmental health problems associated with these sites and would create the opportunity for meeting some of the objectives outlined in Section 3.

The burning of garbage, as previously indicated, pollutes the air with foul smoke and airborne contaminants, and the fire itself often poses significant wildfire hazards (e.g. Burwash fire). Poorly located dump sites have a high potential for polluting surface and subsurface water resources and they can become infested with flies and other disease carrying insects. Uncovered wastes offer a food source to birds, rodents and other animals and thus there is a potential for spreading disease to animals and humans. The sites are also a source of blowing litter which results in poor site aesthetics. Unstaffed and poorly controlled sites often pose safety hazards to users or site maintenance staff because of exploding cans, sharp objects and underground fires. The goal of a sound, environmentally acceptable solid waste disposal system is to ensure that the health of the public and the environment are protected.

In order to provide safe disposal of solid waste, the following previously discussed objectives should be pursued:

- minimizing health and safety hazards to humans and wildlife;
- the reduction and/or elimination of burning wastes;
- reduction of litter;
- increased waste diversion;
- control of scavenging;
- protection of water resources; and
- maintenance of a clean and orderly site at all times.

The continuance of current disposal practices at a large number of sites scattered across the territory, many with inadequate controls and funding, preclude the Yukon Government from being able to achieve these objectives.

6.2.1 Rationale for Regionalization

Under C&TS' current waste management system that consists of a number of small, scattered, under-funded sites, it is very difficult to achieve Community & Transportation Services' stated mandate "*to promote and undertake environmentally sound and cost effective activities and programs.*"

Moving towards centralizing or regionalization of waste management would meet a number of the objectives outlined in Section 3 and would provide C&TS Community Operations with a number of advantages, which include:

- Reduction and/or elimination of wildlife interactions and impacts
- Reduction of air emissions
- Reduction and/or elimination of groundwater impacts
- Reduction and/or elimination of wildfire risk
- Reduction and/or elimination of site litter
- Reduced environmental liability to Government of Yukon

It is recommended therefore that the Yukon Government pursue a long-term strategy of regionalization with a view to phasing out redundant or unnecessary sites in favour of centrally located facilities that serve a number of communities.

6.2.2 Transferring Waste to Regional Facilities

As previously noted the concept of transferring wastes has now become commonplace with many municipalities and regional governments opting to close small sites and building in their place, transfer facilities for subsequent haul to better equipped regional disposal sites. Transfer stations have become increasingly popular in Northern British Columbia where demographics are similar to those encountered in Yukon.

Given the large number of small-unstaffed disposal sites in Yukon, the concept of transferring and sharing facilities deserves due consideration. The incorporated communities of Haines Junction, Carmacks and Teslin have all expressed interest in further exploring this approach. A review was undertaken at a very preliminary level in order to give YTG an indication of what regionalizing wastes might mean in terms of costs. Should the concept of waste transfer be considered further, a more detailed study and analysis, using a transfer station costing model, would need to be carried out along with social and environmental considerations for each site. Furthermore, successful, cost-effective regionalization of waste management would require the participation and buy-in of incorporated communities.

6.2.3 Amalgamation of Southern Yukon Sites – Haines Junction to Whitehorse and Southern Lakes Area Sites

The successful implementation of a regional strategy in the Yukon will require willingness on the part of both Yukon Government and incorporated municipalities to work co-operatively. In the southern Yukon there is a potential for at least 13 sites to be amalgamated into a single shared regional system. As an example, a preliminary analysis of a system utilizing the City of Whitehorse Son of War Eagle Landfill as a regional site was considered. This site is central, has the necessary infrastructure and has long-term capacity potential. An alternative to the City of Whitehorse landfill would be the creation of a new regional landfill. A new regional landfill would, however, increase disposal costs significantly.

This example regional system involves converting the following sites to transfer stations:

- Haines Junction
- Champagne
- Carmacks
- Braeburn
- Deep Creek
- Mile 9
- Carcross
- Tagish
- Marsh Lake
- Johnson Crossing
- Teslin

It is assumed that the Canyon site would be closed for a number of reasons: the Canyon site is located on Champagne Aishihik settlement land; the site is less than 25 km from the Haines Junction dump site; and the site is underutilized, receiving less than 0.5 tonne of refuse per week. At this time, no other sites were determined to be redundant in the Southern Lakes area. C&TS may wish to review their policy relating to their involvement in “Type III” dumpsites (e.g. Braeburn, Silver City and Johnson Crossing).

Capital costs for transfer stations have been developed utilizing two different types of transfer facilities. Both are relatively low cost systems that do not use enclosed structures. The first is an open top container system and the second a *Transtor* transfer system sold by Haul-All (see photos 11 to 13). The container system has the advantage of having lower capital costs (see Tables 5 and 6) but significantly higher operating costs due to the need to haul individual containers to and from the regional landfill site.

Table 5. Capital Costs

| Open Top Container Transfer Stations Capital Costs | Transtor Transfer Station Capital Costs |
|---|--|
| <p>1. Site Development (assumes @ existing landfill site) Site Grading \$2,500 Access Road \$5,500 Fencing (assumes already in place) N/A Sub Total \$7,500</p> <p>2. Retaining Structure (2-40 yd bin system) Granular base \$7,300 Concrete slabs \$10,000 Concrete Footings \$4,700 Concrete Retaining Wall \$20,000 Supply and Place Fill \$13,500 Safety Railings \$2,000 Sub Total \$57,500</p> <p>3. Utilities (optional) 110 v. power supply (assumes available at roadway) \$7,300 Sub Total \$7,300</p> <p>4. Site Finishes Perimeter Fence (assumes in place) N/A Landscaping \$2,000 Signs \$500 Sub Total \$2,500 Total \$74,800</p> | <p>1. Site Development (assume existing landfill site) Site Grading \$1,000 Access Road \$3,500 Fencing (assume already in place) N/A Sub Total \$4,500</p> <p>2. Retaining Structure Retaining Wall (Steel Binwall) \$7,500 Retaining Wall – Assembly \$1,700 Wall Granular Fill \$4,000 Ramp Fill \$8,000 Guard Rail (steel) \$1,000 Sub Total \$22,000</p> <p>3. Utilities (optional) 110 v electrical supply (assumes available @ roadway) \$7,300 Sub Total \$7,300</p> <p>4. Site Finishes Perimeter Fence (assumes in place) N/A Landscaping \$2,000 Signs \$500 Sub Total \$2,500</p> <p>5. Transtor System Transtor TS 400 \$55,000 Transtor Freight & On-Site Assembly \$8,500 Foundations \$4,000 Sub Total \$67,500 Total \$104,000</p> |



Table 6. Operating Costs (Annual)

| TRANSTOR SYSTEM (NO ATTENDANT) | | |
|--------------------------------|---|-----------------|
| Haul Costs | \$90 / hour 2 hours × 52 weeks (assumes 2 hours/week/site) | \$9,360 |
| Maintenance | (equipment and litter) \$25 × 1 hours × 52 weeks | \$1,300 |
| Contingency | @ 15% | \$1,600 |
| TOTAL | | \$12,260 |

| OPEN TOP CONTAINER TRANSFER OPERATING COSTS (NO ATTENDANT) | | |
|--|------------------|-----------------|
| Haul Costs | \$450 × 52 weeks | \$23,400 |
| Container Rental | \$120 × 12 | \$1,440 |
| Contingency | @ 15% | \$3,730 |
| TOTAL | | \$28,570 |

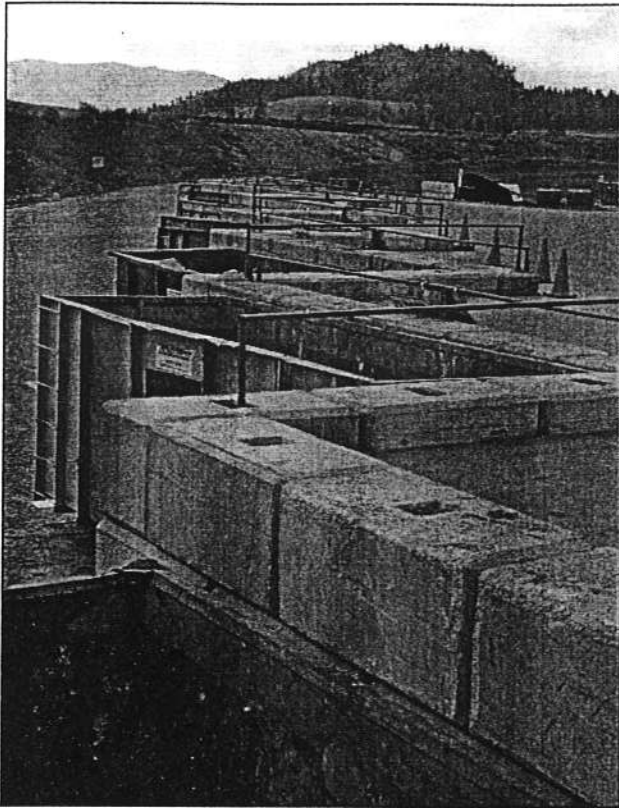


Photo 10. Open Top Container

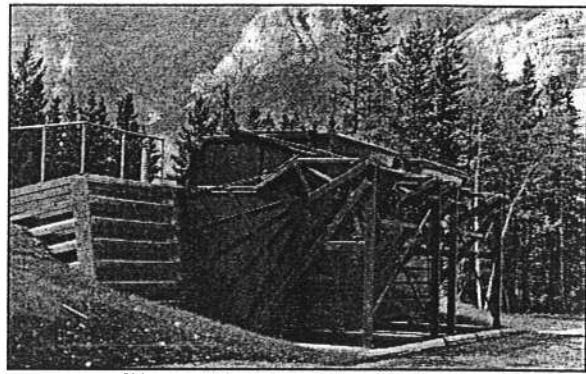


Photo 11. Transtor System

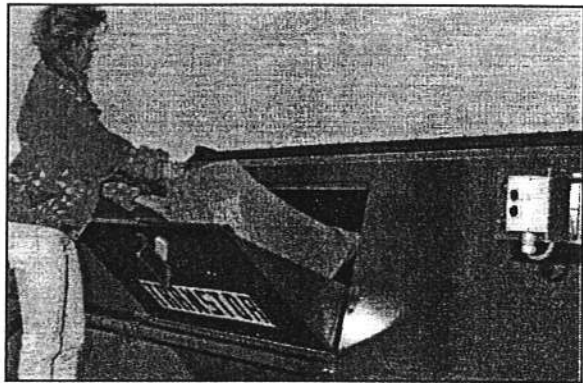


Photo 12. Transtor Drop Chute



Photo 13. Transtor Transfer Station

Haul-All's *Transtor* systems utilizes a fully enclosed rotating bin which discharges refuse into large transfer trailer using hydraulic power from the tractor. It is estimated that a single tractor trailer unit would be able to service all sites on a weekly basis. The frequency of collection requires more detailed analysis and it is likely that the frequency for low generating communities could be reduced for certain sites in winter. Both systems are modular and can be extended to accommodate extra bins or containers. Due to its fully enclosed design, user activated chutes and hydraulic lids, the Haul-All system has proven to be the most effective in minimizing the spread of litter, eliminating the generation of leachate and preventing wildlife access.

The total system capital costs for eleven transfer facilities using a generic non-site specific facility in all cases, is as follows (costs for individual facilities will vary based on site conditions at each location):

| | | | | |
|----|---------------------------------|-------------------------|---|-------------|
| 1) | Open top container system | 11 sites @ \$74,800/ea | = | \$822,800 |
| 2) | Haul-All <i>Transtor</i> system | 11 sites @ \$104,000/ea | = | \$1,144,000 |

Annual operating costs are as follows:

| | | | | |
|----|---------------------------------|------------------------|---|-----------|
| 1) | Open top container system | 11 sites @ \$28,600/ea | = | \$314,600 |
| 2) | Haul-All <i>Transtor</i> system | 11 sites @ \$12,300/ea | = | \$135,300 |

Operating costs exclude tipping fees, scrap metal management, tire management, possible shredding of yard waste using a mobile tub grinder, snow clearing and road maintenance. It is assumed that staffing of sites would only be required for those sites which have recycling drop off facilities/depots (e.g. Haines Junction and Mile 9)

Conceptually, the transfer station would be for the collection of domestic waste only. Scrap metal would be accepted and stockpiled at the site for routine collection. Lead-acid batteries should be stored in leak-proof containers and picked up routinely. Other recycling opportunities would be limited to either off-site local recycling societies or facilities operated by those societies on site. Generally, composting is not viable at unstaffed facilities such as the proposed transfer stations due to the need for frequent maintenance and the potential for contamination. Inert wastes (e.g. concrete, asphalt, etc.) should be landfilled at designated sites as suggested in the short-term strategy.

A full analysis incorporating the foregoing should be carried out once a decision is made to pursue the strategy of regionalization. Additional review should include consultation with stakeholders, public consultation and further economic analysis.

6.2.4 Other Regionalization Opportunities

The regionalization of other sites was considered but given the small volume of wastes, high capital and operating costs and long haul distances, regionalization is difficult. Possible waste management regions include:

- Ross River and Faro
- Dawson City, Stewart Crossing, Mayo, Keno and possibly, Pelly Crossing
- Watson Lake and Upper Liard (consideration of closing the Upper Liard site is recommended since it is located less than 15 km from the Watson Lake site).

As with the southern region, Further studies are required to determine the feasibility of regionalization of these other waste management areas, including stakeholder and public consultation and economic analysis. Furthermore, participation of municipalities and/or First Nations is fundamental to the feasibility of regionalization in these areas.

6.2.5 Yukon Regulations/Policies

C&TS should consider promoting the development of policies, programs and legislation in support of the objectives listed in Section 3. The following activities have been successful in other parts of North America and may be appropriate for the Yukon:

- *Diversion/reduction goals:* Following the Canadian Council of the Ministers of the Environment (CCME) 1989 adoption of a 50% waste reduction goal, most provinces adopted similar goals and requirements to achieve significant waste reduction. Waste reduction goals and implementation schemes (usually required as part of solid waste management plans) have served to dramatically decrease the amount of waste destined for disposal in the last 10 years. The Yukon Government could commit to a waste reduction target and stimulate interest in waste diversion throughout the territory.
- *Stewardship programs:* The Yukon should be commended for its beverage container stewardship program and the draft tire stewardship initiative. Other materials should also be considered for stewardship programs; especially those items that are challenging to manage at C&TS sites, such as used oil and other HHW.
- *Funding Assistance:* The Yukon lacks some equipment that could enhance waste management services. In the short-term recommendations, a shared tub grinder is recommended to handle clean wood wastes generated in the Yukon. Other opportunities of this nature likely exist and could be assisted by the Yukon Government. Assistance could take the form of coordinating equipment purchase or sharing by Yukon municipalities and C&TS. The Yukon Government could purchase equipment and lease it at a low cost to local governments and industry. Other options could be providing capital funding for equipment (especially when that equipment will be shared by a number of communities) or a low-interest capital loan fund for government and industry.

Although none of the programs or policies would be directly developed by C&TS, C&TS could play a role in initiating and participating in a discussion regarding future solid waste programs and policies of the Yukon Government.

6.2.6 Public Consultation

As stated in the objectives, public consultation is critical to the success of implementing a solid waste strategy. Consultation provides an opportunity to share ideas, consider alternative approaches, improve upon the recommendations and create a solid waste system that works for everyone. Encouraging and integrating public input, and then demonstrating the integration of public's thoughts will create long-term support for the strategy and subsequent solid waste management plans.

Consultation should be undertaken when considering both short and long-term changes that affect the public or other stakeholders, such as recycling societies, waste management industry and municipal governments. Such changes could be operational or financial in nature. It is particularly recommended that early and on-going consultation occur with the public and stakeholders if regionalization of solid waste facilities is pursued.

6.3 Summary of Recommendations

Table 7 provides a summary of the recommendations contained within the short and long-term strategies. For each set of recommendations, a priority number has been suggested. The priorities are based on the current availability of C&TS staff and financial resources, environmental risk and feedback from C&TS staff. Future discussions within the branch, public input and budgets are anticipated to further define the priorities of C&TS' solid waste management strategy.

| RECOMMENDATIONS | Recommended Priority |
|---|----------------------|
| <i>Material Management</i> | |
| • Encourage clear segregation of reusable and recyclable materials such as scrap metal, wood waste, clean fill and appliances containing ODS. | 1 |
| • Have site contractor maintain the cleanliness of segregated piles. | 2 |
| • Improve signage for the disposal of ODS-containing appliances to ensure that the ODS does not get released into the atmosphere. Ensure that the site contractors keep these appliances upright. Do not pile the appliances until the ODS has been properly removed. | 3 |
| • Require site users to remove the doors from refrigerators and freezers. | 4 |
| • Do not bury scrap metal in trenches. | 5 |
| • Consider acquiring a tub grinder for wood grinding purposes. The grinder could be cost-shared with other government agencies. | 6 |
| • Grind clean wood waste (from construction, demolition, grubbing and tree trimmings) to make a usable chip product available for community purposes. | 7 |
| • Combine the scrap metal removal contract for several or all sites. Consider allowing the municipalities to "piggyback" on the metal contract. | 8 |
| • Schedule scrap metal removal for the dry times of the year. | 9 |
| • Support a tire stewardship program that requires the vendors and generators of tires to pay for the tire disposal system. | 10 |
| • Encourage the reuse of waste materials through controlled scavenging or reuse areas | 11 |

Solid Waste Strategy - Yukon Government

| RECOMMENDATIONS | Recommended Priority |
|---|----------------------|
| <i>Material Management Continued..</i> | |
| <ul style="list-style-type: none"> • Encourage Renewable Resources to conduct a household hazardous waste (HHW) generator education program. | 12 |
| <ul style="list-style-type: none"> • Encourage the Yukon Government to provide local recycling societies with the equipment and training for the collection of HHW. | 13 |
| <ul style="list-style-type: none"> • Increase HHW collection opportunities for residential generators. | 14 |
| <ul style="list-style-type: none"> • Consider implementing disposal bans on HHW. | 15 |
| <i>Site Management</i> | |
| <ul style="list-style-type: none"> • Reinforce with site contractors the requirement for regular use of cover material. | 1 |
| <ul style="list-style-type: none"> • More frequent servicing to keep sites tidy and safe. | 2 |
| <ul style="list-style-type: none"> • Provide litter fencing at least 3 metres high around domestic waste trenches. | 3 |
| <ul style="list-style-type: none"> • Grade sites so that precipitation drains away from the trenches. | 4 |
| <ul style="list-style-type: none"> • Continue to install and maintain electric fencing around sites. | 5 |
| <ul style="list-style-type: none"> • Implement groundwater and surface water monitoring. Determine priority sites. | 6 |
| <i>Financial Management</i> | |
| <ul style="list-style-type: none"> • Consider asking municipalities if they would like to partner in contracting. | 1 |
| <ul style="list-style-type: none"> • Look for opportunities to amalgamate site servicing contracts to allow contractors to incorporate some economies of scale. e.g. Contract out the scrap metal removal for all C&TS sites needing service within the fiscal year. | 2 |
| <ul style="list-style-type: none"> • Increase O&M budget to accommodate more frequent site maintenance. | 3 |
| <ul style="list-style-type: none"> • Provide on-site signage regarding usage of the site (i.e. not for large generators of waste unless previously approved in writing by C&TS). | 4 |
| <ul style="list-style-type: none"> • Contact potential generators through municipalities, developers, institutions and contractors to inform them of proper disposal locations and restrictions. | 5 |
| <ul style="list-style-type: none"> • Implement Rural Services Policy. | 6 |
| <ul style="list-style-type: none"> • Identify regional disposal sites for inert waste. | 7 |
| <ul style="list-style-type: none"> • Consider limiting access through a card-lock system at locations of high external usage such as Marsh Lake. | 8 |
| <i>Communication Recommendations</i> | |
| <ul style="list-style-type: none"> • Improve signage at the sites to provide more information on how and where to dispose of specific wastes on site. | 1 |
| <ul style="list-style-type: none"> • Develop a handout to be picked up at the site informing reader about how to use the site and answering common solid waste management questions. Also consider distributing a regular Newsletter to the users of the sites. | 2 |
| <ul style="list-style-type: none"> • Establish an on-going stakeholder committee to address solid waste management issues across the Yukon and identify opportunities to share expertise and resources. | 3 |

Solid Waste Strategy - Yukon Government

| RECOMMENDATIONS | Recommended Priority |
|---|----------------------|
| <i>Regionalization</i> | |
| <ul style="list-style-type: none"> • Pursue a long-term strategy of regionalization with a view to phasing out redundant or unnecessary sites in favour of centrally located facilities that serve a number of communities, with a focus on the south Yukon initially. | 1 |
| <ul style="list-style-type: none"> • Conduct initial stakeholder consultation to establish municipal interest and participation in regionalization concept for southern Yukon area. <ul style="list-style-type: none"> - Conduct a more detailed study and analysis of regionalization concept, using a transfer station costing model. - Consider closure of Canyon site. | 2 |
| <ul style="list-style-type: none"> • Consider other regionalization opportunities such as Faro and Ross River. <ul style="list-style-type: none"> - Conduct early and on-going consultation with the public and stakeholders re. regionalization of solid waste facilities. - Determine social and environmental considerations for each site. - Through social, environmental and economic analysis, determine applicability of transfer station, landfill, trench and burn or closure for each site. - Consider closure of upper Liard site. - Phase out open burning of solid waste wherever practical. | 3 |
| Yukon Government Policies and Program | |
| <ul style="list-style-type: none"> • Initiate and participate in a discussion regarding programs and policies of the Yukon Government to enhance solid waste management , such as: <ul style="list-style-type: none"> - Establishing waste diversion/reduction goals - Establishing additional stewardship programs with an emphasis on hard-to-manage wastes such as HHW - Proving funding assistance to the waste management industry . | 1 |

7. References

- British Columbia Ministry of Environment, July 1990. "A Review of Rural Waste Management Options".
- C.J. Bull & Associates & Cameron Advisory Services Ltd., July 2000. "Little Salmon Carmacks First Nation, Carmacks Area Solid Waste Disposal Conceptual Design Study – Final Report".
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- Government of Yukon Transportation Maintenance Branch, July 2000. "Maintenance of Solid Waste Disposal Facilities".
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- Lorimer & Associates & Metz Murray & Associates, September 1997. "Quigley Solid Waste Disposal Facility, Management Plan".
- Yukon Government Community and Transportation Services Engineering and Development Branch, March 1996. "Solid Waste Management Procedures & Guidelines".
- Yukon Government Renewable Resources, September 2000. "Guidelines for the Preparation of Solid Waste Management Plans".
- Yukon Territory, 1991. "Environment Act – Solid Waste Regulations".

Appendices

Appendix A

Project Contacts

Appendix A. Contact List

The following people were contacted in the development of the solid waste strategy:

| CONTACT PERSON | ORGANIZATION |
|---|--|
| Jim Slater | Association of Yukon Communities |
| Sabine Schwieger Brian Crist Jim McLeod Wayne Tuck | City of Whitehorse |
| Art Dell, Program Engineer Georgi MacStephen, Manager, Community Operations | Community and Transportation Services Yukon Government |
| Robert Niven Kelly Phillips | Haul All Transportation Systems |
| Florian Vedress | Transportation Engineering Branch Community and Transportation Services Yukon Government |
| Jim Cheverie | Northern Rockies Regional District City of Fort Nelson |
| Lewis Rifkind, Projects Coordinator Karl Stellbrink, Executive Director | Raven Recycling Society |
| Jim Martin | Regional District of Fraser-Fort George |
| Janine Kostelnik Bryan Levia Shannon Clark Pat Paslawski | Renewable Resources Yukon Government |
| Wayne Sale | Sale Salvage |
| Jeff Brown | Sound Resource Management Group |
| Norman Carlson Manager, Public Works | Town of Dawson City |
| David Skidd, Chief Administrative Officer | Town of Faro |
| Colin Dean Chief Administrative Officer | Town of Haines Junction |
| Don Spink, Chief Administrative Officer | Town of Teslin |
| Hilda Price, Chief Administrative Officer Keith Camilli, Assistant Public Works Superintendent | Town of Watson Lake |

Appendix B

Objectives for the Solid Waste Management Strategy

1. Waste Management Objectives

1.1 Objective #1: Protect Human And Environmental Health

1.1.1 Locate Solid Waste Management Facilities in the Most Environmentally and Socially Appropriate Places

Rationale:

- **Yukon Waters Act (1992)**

“9.(1) Except in accordance with the conditions of a licence or as authorized by regulations made under paragraph 33(1)(n), no person shall, subject to subsection (2) deposit or permit the deposit of waste:

(a) in any waters in a water management area; or

(b) in any other place under conditions in which the waste, or any other waste that results from the deposit of that waste, may enter any waters in a water management area.”

NOTE: in the Yukon Waters Act, “waters” means any inland water, whether in a liquid or frozen state, on or below the surface of the land in the Yukon Territory.

- **Protects environmental, wildlife and human health, Environment Act: (Yukon, 1991)**

Preamble: *“...Recognizing that a healthful environment is indispensable to human life and health; and ...*

Recognizing that the Government of Yukon is the trustee of the public trust and is therefore responsible for the protection of the collective interest of the people of the Yukon in the quality of the natural environment;”

Objectives: *“5.(1) The objectives of this Act are (a) to ensure the maintenance of essential ecological process and the preservation of biological diversity;”*

- **Better waste management related decision-making and implementation, Environment Act: (Yukon, 1991)**

Preamble: *“...Recognizing that comprehensive, integrated and open decision-making processes are essential to the efficient and fair discharges of the environmental responsibilities of the Government of Yukon”*

1.1.2 Reduce Risk to Wildlife

Rationale:

- **Solid Waste Regulations (Yukon 2000):**

Schedule 1. Operating Standards for Dumps *“1.(c) Solid waste shall be handled and disposed of in a manner that does not attract or is not likely to attract wildlife.”*

Appendix B - Objectives for Solid Waste Management Strategy

- **Reduction of litter on-site caused by wildlife, Solid Waste Regulations (Yukon 2000):**
Schedule 1. Operating Standards for Dumps “*1.(b) Solid waste shall be handled and disposed of in a manner that does not cause littering in the area.*”

1.1.3 Reduce Air Emissions

Rationale:

- **Reduce impact of greenhouse gases, Kyoto Protocol To The United Nations Framework Convention On Climate Change (signed by Canada April 29th, 1998):**
Article 3.1: “*The Parties included in Annex I [Canada] shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A [e.g. carbon dioxide from solid waste disposal on land and waste incineration] do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.*”
- **Decrease risk to human health, Air Emissions Regulations (1998):**
Section 6. Damage and Harm: “*No person shall release or allow the release of any air contaminant to such extent or degree as may:*
(a) *cause or be likely to cause irreparable damage to the natural environment; or*
(b) *in the opinion of a health officer, cause actual or imminent harm to public health or safety.*”
- **Toxicity concerns, Final Act Of The Conference Of Plenipotentiaries On The Stockholm Convention On Persistent Organic Pollutants (signed and ratified by Canada on May 23rd, 2001)**
Article 5, Measures to reduce or eliminate releases from unintentional production: “*Each Party [Canada] shall at a minimum take the following measures to reduce the total releases derived from anthropogenic sources of each of the chemicals listed in Annex C, with the goal of their continuing minimization and, where feasible, ultimate elimination.*”
Annex C, Unintentional Production, Part I: Persistent organic pollutants subject to the requirements of Article 5: “*Polychlorinated dibenzo-p-dioxins and dibenzofurans, hexachlorobenzene and polychlorinated biphenyls may also be unintentionally formed and released from the following source categories, including:*
(a) *Open burning of waste, including burning of landfill sites;*”
Annex C, Unintentional Production, Part V: General guidance on best available techniques and best environmental practices: “*General prevention measures relating to both best available techniques and best environmental practices....:*”

- (f) *Improvements in waste management with the aim of the cessation of open and other uncontrolled burning of wastes, including the burning of landfill sites. When considering proposals to construct new waste disposal facilities, consideration should be given to alternatives such as activities to minimize the generation of municipal and medical waste, including resource recovery, reuse, recycling, waste separation and promoting products that generate less waste. Under this approach, public health concerns should be carefully considered;*"

1.1.4 Reduce Impacts on Ground and Surface Waters

Rationale:

- **Yukon Waters Act (1992)**

"9.(1) Except in accordance with the conditions of a licence or as authorized by regulations made under paragraph 33(1)(n), no person shall, subject to subsection (2) deposit or permit the deposit of waste:

- (a) *in any waters in a water management area; or*
- (b) *in any other place under conditions in which the waste, or any other waste that results from the deposit of that waste, may enter any waters in a water management area."*

NOTE: in the Yukon Waters Act, "waters" means any inland water, whether in a liquid or frozen state, on or below the surface of the land in the Yukon Territory.

- **Decrease risk to human and environmental health, Public Health and Safety Act (Yukon, 1958):**

Section 6.(3): *"No person shall accumulate or deposit any refuse, garbage excreta, manure, offal or other offensive matter in a manner likely to become injurious to health or to become a public nuisance."*

NOTE: in the Public Health and Safety Act, "Public Nuisance" includes everything noxious or offensive which affects the property or the health comfort or convenience of the general public, or of all persons who happen to come within its operation;" and

Solid Waste Regulations (Yukon 2000):

Schedule 1. Operating Standards for Dumps *"1.(a) Solid waste shall be handled and disposed of in a manner that does not cause or is likely to cause a significant adverse effect or unsafe conditions or is a threat to public health."*

1.1.5 Reduce Fire Hazard Risk

Rationale:

- **Potential risk to adjoining lands:** *Dump sites with open burning have been identified as a "special fire risk" to Yukon communities (Yukon Community Wildfire Risk and Reduction Assessment, 2000).*

Appendix B - Objectives for Solid Waste Management Strategy

- **Liability of YTG** – 1999 Burwash fire destroyed eight structures in the community of Burwash Landing. Fire suppression costs are estimated to have been *2.7 to 2.8 million dollars* (Dumas, pers. comm., 2001). To date, \$600,000 in compensation has been paid to Burwash Landing residents by YTG (Magnuson, pers. comm., 2001). The 1999 wildfire originated from the routine burning of household garbage at the community dump (Ember Research Services Ltd., 2000).

1.1.6 Reduce Litter

Rationale:

- **Public Health and Safety Act (Yukon, 1958):**

Section 6.(3): *“No person shall accumulate or deposit any refuse, garbage excreta, manure, offal or other offensive matter in a manner likely to become injurious to health or to become a public nuisance.”*

NOTE: in the Public Health and Safety Act, *“Public Nuisance” includes everything noxious or offensive which affects the property or the health comfort or convenience of the general public, or of all persons who happen to come within its operation;*”

- **Solid Waste Regulations (Yukon 2000):**

Schedule 1. Operating Standards for Dumps *“1.(b) Solid waste shall be handled and disposed of in manner that does not cause littering in the area.”*

1.1.7 Reduce Waste Generation Rates by 50% of 2001 Rates

Rationale:

- **Canada’s Green Plan (1990):**

Goal 1: Clean Air, Water and Land: *“A 50-per-cent reduction in Canada’s generation of waste..”*

- **Solid Waste Regulations (Yukon 2000):**

Section 12. Solid Waste Management Plans: *“(f) a description of the strategies and initiatives that will be used to address waste segregation and the reuse, reduction and recycling of waste, including composting within the municipality or specified waste management area;”*

- **Solid Waste Regulations Public Participation: Final Report (1998):**

Waste Reduction - *87% of Yukon residents surveyed indicated the Government should develop more programs to reduce waste.*

1.2 Objective #2: Minimize Costs

1.2.1 Cost Effective Waste Management

Rationale:

- **Fiscal responsibility/reduce taxes**
- **Development of Sustainable Waste Management Practices, Environment Act: (Yukon, 1991)**
Preamble : “...Recognizing that the Government of the Yukon has expressed its commitment to economic progress and environmental conservation in the Yukon Economic Strategy and the Yukon Conservation Strategy. ;”
Objectives: “5.(1) The objectives of this Act are (c) to promote sustainable development in the Yukon;” and
Objectives: “5.(2) The following principals apply to the realization of the objectives of this Act (a) economic development and the health of the natural environment are inter-dependent;”

1.2.2 Implement Effective Cost Recovery Mechanisms Where Possible

Rationale:

- **Solid Waste Regulations Public Participation Final Report (1998):**
Waste Reduction - 70% of Yukon residents surveyed indicated that Waste Generators Should Pay for the Waste they Create.

1.3 Objective #3: Address Public And Stakeholder Needs

1.3.1 Public/Community Inclusion in the Design of the Yukon Solid Waste Management System

Rationale:

- **Better decision making and easier implementation, Environment Act: (Yukon, 1991)**
Objectives: “5.(1) The objectives of this Act are (c) to promote sustainable development in the Yukon;
(f) to utilize fully the knowledge and experience of Yukon residents in formulating public policy on the environment; and
(g) to facilitate effective participation by Yukon residents in the making of decisions that will affect the environment.”

1.3.2 Public Acceptability of the Solid Waste Strategy

Rationale:

- **Politically supportable (easier decision-making)**
- **Easier implementation**

1.3.3 Understanding and Participation in Proper Solid Waste Management by All Sectors

Rationale:

- **Easier implementation, Solid Waste Regulations Public Participation Final Report (1998):**
Education - *77% of Yukon residents surveyed supported more [waste related] educational programs.*
- **Environmental and human health protection**
- **Improves economics of waste management system**

Objective #4: Be Sustainable

a) Increase Waste Diversion

Rationale:

- *Extends life of disposal facilities*
- *Reduces need for burning*
- *Reduces tax burden associated with disposal*
- *Decreases resource consumption*

b) Increase Recycling Opportunities (Including Markets)

Rationale:

- *Increase the recycling and waste reduction rates*
- *Potential to decrease the cost to the generator and waste management industry*

c) Ensure That All Residents And Businesses In The Yukon Have Access To Environmentally And Socially Acceptable Waste Management

Rationale:

- *Politically and publicly desirable/acceptable*
- *Long-term environmental protection*

2. References

Dumas, G., 2001:

Telephone conversation held between Mr. Gordan Dumas (Head, Fire Management, DIAND) and Mr. Forest Pearson (Gartner Lee Limited) on July 5th, 2001.

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Government of Yukon, 1991:

Environment Act Whitehorse, Yukon.

Government of Yukon, 1998:

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Government of Yukon, 2000:

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Hynes, J., 1998:

Solid Waste Regulations Public Participation Final Report. Prepared for the Environment Protection and Assessment Branch. Yukon Renewable Resources. Whitehorse, Yukon.

Appendix C

Solid Waste Facilities Information

**Solid Waste Facilities
Unincorporated Communities**

| LOCATION: | Site Location | Land Zoning | Maintained by | Areas / Communities Serviced Includes F.N. Community | Approx. # of Regular Users | Quantity (tonnes/yr) (Note A) | Approx. Lifespan (Years, with burning) | Disposal | Burn Operation (domestic waste only) | Water Tank on-site (by Fall 2000) | Environmental Monitoring of land,air,water | Electric Fence In Place | Plans for Expansion/ Modification (Note B) |
|------------------------|--|--|---------------|---|----------------------------|-------------------------------|--|--|---|-----------------------------------|--|-------------------------|---|
| Beaver Creek | one km from intersection of Sewmill Rd. and km 1938.4 Alaska Hwy (152 ha) | Federal Reserve YTG #115K07-0000-00038 | C&TS Hwys | Beaver Creek | 130 | 110 | 20+ | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | ✓ | no | ✓ | Collection of household hazardous waste |
| Braeburn | km 276 Klondike Hwy 0.34 ha | Federal Reserve YTG #105E05-0000-00015 | Contractor | Braeburn, Fox Lake | 10 to 15 | 10 to 13 | unknown | Domestic refuse and Batteries | as required | | no | ✓ | None at present. |
| Burwash Landing | approx. km 1750 Alaska Hwy NE side | Federal Reserve request on hold pending land claims | C&TS Hwys | Burwash Landing /Destruction Bay | 127 | 110 | 10 | Domestics only | weekly | ✓ | no | ✓ | Collection of household hazardous waste. |
| Canyon Creek | km 1609.4 Alaska Hwy | CAFN settlement land, no right of access | Contractor | Canyon Creek | 25 | 25 | 20+ | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | as required | | no | ✓ | None at present. |
| Carcross | km 50.7 Tagish Rd. Hwy 8 | Federal land, transfer to YTG in process. | Contractor | Carcross | 430 | 365 | 20 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | | Groundwater monitoring wells in place. Not monitored at present. | ✓ | Collection of household hazardous waste. New trench required by 2002. |
| Champagne | km 1567 Alaska Hwy. north side (15 ha) | Federal Reserve to YTG #115A16-0000-00007 | Contractor | Champagne / Mendenhall Subdivision | 50 | 45 | 20+ | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | as required | | no | | Collection of household hazardous waste. Electric fencing is required by SW Permit by Dec. 31/02. |
| Deep Creek | North side of Deep Creek road, 600m from intersection with km 224.5 Klondike Hwy | Federal Reserve to YTG # 105E03-0000-00018 | Contractor | Deep Creek / Horse Creek / Takhini Hot Springs Road | 100 | 85 | 20+ | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | | no | ✓ | Collection of household hazardous waste. |
| Destruction Bay Metals | approx km 1746.7 Alaska Hwy NE side | Federal Reserve to YTG # 115G07-0000-012 (gravel pit) | C&TS Hwys | Destruction Bay / Burwash Landing | 127 | unknown | unknown | Metal, Tires, Batteries, Brush & Construction Materials | Metals recycled or buried every 2- 5 yrs. | | no | not required | Shakwak project entering this area likely to require extra O&M to keep site under control. |
| Johnson's Crossing | 700m up South Canal Road from intersection with Alaska Hwy. | Federal Reserve to YTG # 105C06-0000-00045 | C&TS Hwys | Johnson's Crossing | 35 | 30 | 20+ | Domestic refuse, & Batteries, | as required | ✓ | no | ✓ | None at present. |
| Keno City | just outside town on Silver Trail | unknown | C&TS Hwys | Keno City / Elsa | 20 | 17 | 10 | Domestic refuse, Metal, Tires, Brush & Construction Materials | weekly | | no | | Collection of household hazardous waste. Electric fencing is required by SW Permit by Dec. 31/02. |
| Marah Lake | km 1428.5 Alaska Hwy 25 ha | Federal Reserve to YTG # 105D09-0000-00030 | Contractor | All Marsh Lake Subdivisions | 1000 | 850 | 15 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | twice per week | | Groundwater monitoring wells in place, not monitored at present. | | Collection of household hazardous waste. Electric fencing is required by SW Permit by Dec. 31/02. New trench required in 01/02. |
| Mt. Lorne | km 144.3 South Klondike Hwy | Commissioner's Land Reserved to E&DB Reserve #15,16,17 | Contractor | Mt. Lorne/Robinson Sub./Annie Lake Rd./Bear Creek / Golden Horn | 380 | 320 | 2* | Domestic refuse, & Batteries Recyclables accepted | no burn operation | | no | | Electric fencing is required by SW Permit by Dec. 31/02. |
| Old Crow Domestic | Most westerly part of town 26 ha (both sides) | Federal Reserve to YTG # 105O012-0000-00023 | C&TS Hwys | Old Crow | 280 | 240 | 5 | Domestic refuse only | weekly | | no | | Collection of household hazardous waste. Electric fencing is required by SW Permit by Dec. 31/02. |
| Old Crow Metals | | Federal Reserve to YTG # 105O012-0000-00024 | C&TS Hwys | Old Crow | 280 | unknown | unknown | Metal, Tires, Batteries, Brush & Construction Materials | bury as required | | no | not required | Becoming full, may require burial of metals in 2002. |
| Pelly Crossing | km 458.3 Klondike Hwy 14.06 ha | Federal Reserve To YTG # 115I15-0000-00030 | Contractor | Pelly Crossing | 300 | 260 | 10 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | | no | ✓ | Collection of household hazardous waste. |
| Ross River | Off the Old Trail, west end of town, 9.24 ha | Federal Reserve to YTG # 105F16-0000-00008 | C&TS Hwys | Ross River | 380 | 320 | 10 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | ✓ | no | | Collection of household hazardous waste. Electric fencing is required by SW Permit by Dec. 31/02. |
| Silver City | one km down Silver City road from intersection with km 1693 Alaska Hwy 171.5 ha. | Federal Reserve to YTG # 115G01-0000-00023 gravel pit | C&TS Hwys | Silver City | 20 | 17 | 20+ | Domestic refuse only | as required | | no | ✓ | None at present. |
| Stewart Crossing | approx. one km from intersection of Old Dawson Trail and km 535 Klondike Hwy | Federal Reserve to YTG #115P07-0000-00020 | C&TS Hwys | Stewart Crossing | 30 | 25 | 20 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | as required | ✓ | no | ✓ | Collection of household hazardous waste. |
| Tagish | Taku Subd. Rd. approx. 1km from intersection with Hwy #8, km 26; approx. 5 ha. | Commissioner's Land Reserved to E&DB YTG Lot 1100, D/8 | Contractor | Tagish / Taku River Sub. | 280 | 240 | 10 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | ✓ | no | | Collection of household hazardous waste. Electric fencing is required by SW Permit by Dec. 31/02. |
| Upper Liard | km 1035.3 Alaska Hwy 22.95 ha | Federal Reserve to YTG #105A02-0000-00120 | C&TS Hwys | Upper Liard | 250 | 215 | 5 | Domestic refuse, Metal, Tires, Batteries, Brush & Construction Materials | weekly | ✓ | Groundwater monitoring wells in place, not monitored at present. | | Collection of household hazardous waste.. Electric fencing is required by SW Permit by Dec. 31/02. |

Notes:

- ¹ Based on a generation rate of 0.85 tonnes per person per year (E&DB Internal Report on Ban on Burning, May 1997).
- ² Solid Waste Regulations require all sites to have a Waste Management Plan in place by January 26, 2002 - this includes a site survey, 10 year operating plan and a closure, decommissioning and reclamation plan.
- All Engineering and Development Branch sites must meet requirements of Air Emissions Permit #60-007.
- Contractors or Highway staff performing any burning at these sites between April 1 and September 30 must have a valid Burning Permit from the local Federal Forest Resources office.
- Old Waste Permits are pending - applications were submitted in April 2000.

**Table 6
Solid Waste Facilities
Unincorporated Communities**

**Solid Waste Facilities
Incorporated Communities**

| LOCATION: | Site Location | Land Zoning | Legal Survey | Maintained by Municipal Staff | Maintained by Contractor | Areas / Communities Serviced | Approx. # of Regular Users | Estimated Quantity of Solid Waste ^(A) (tonnes/yr) | Approx. Lifespan (Years) | Domestic | Metals | Brush & Construction Debris | Tires | Batteries | Recyclables | Burn Operation (domestic waste only) | No-Burn Operation | Environmental Monitoring of land, air, water | Electric Fence in Place | Plans for Expansion/ Modification |
|------------------------|--|---|---|-------------------------------|--------------------------|--|----------------------------|--|--------------------------|----------|--------|-----------------------------|-------|-----------|---------------------------|--------------------------------------|-------------------|--|-------------------------|---|
| Carmacks | 1.2 km southwest of Village, east side of highway. | Solid Waste Site | | ✓ | | Carmacks and surrounding area. | 490 | 343 | +22 | ✓ | ✓ | ✓ | ✓ | ✓ | Separate Recycling Centre | ✓ | | no | no | Major site improvements. |
| Dawson City | a few km south of Town, west side of Klondike Hwy. | YTG Reserve No. MI - Industrial Business | In progress. To be registered as lot 11142, Quad 116B/3 | ✓ | | Dawson City, Klondike Valley and surrounding area. | 3000 | 2550 | 20 | ✓ | ✓ | ✓ | ✓ | ✓ | Also in center of town | cardboard & brush only | ✓ | yes | yes | No-burn operation for domestic waste, Pilot Project work includes composting. |
| Faro | Directly opposite town access road. | Lot 1027 | | ✓ | | Faro and surrounding area. | 450 | 350 | +20 | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | no | yes | None at present. |
| Haines Junction | near km 1630 Alaska Hwy. East side. | YTG Reserve No. 023 PD - community use | Pending finalization of Official Community Plan. Lot 1083 Quad 115A/13. | ✓ | | Haines Junction and surrounding area. | 1000 | 850 | 5 - 8 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | no | yes | Moving towards a no-burn operation for domestic waste, Pilot Project work includes preparation of a Waste Management Plan with emphasis on programs that will reduce waste and increase the life of their facility through waste diversion. |
| Mayo | km 49.6 Silver Trail | Federal Reserve 105M12/38 NOZ (no zoning) | | ✓ | | Mayo and surrounding area. | 500-600 | 365 | 20 | ✓ | ✓ | ✓ | ✓ | ✓ | In town | ✓ | | no | yes | None at present. |
| Teslin | 1 km south east of Nisutlin River Bridge | Federal Reserve 105C02/29 | | ✓ | | Teslin and surrounding area. | 600 | 510 | 10 - 15 | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | no | yes | Major site improvements completed in 99/00. |
| Watson Lake | near km 1022 Alaska Hwy north side (Auburn Drive) | Federal Reserve 105A02/42 | | ✓ | | Watson Lake and surrounding area. | 1800 | 1600 | unknown | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | no | no | None at present. |
| Whitehorse | north on Alaska Hwy, first left after Fish Lake Road | Lot 1166 105D/11 Public Utility zoning | | | ✓ | City of Whitehorse | 23000 | 22500 | +20 | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | yes | yes | None at present. |

Notes:

^(A) As provided by municipalities in Solid Waste Permit Applications and converted using 135 kg/m³. Or, where unknown, based on a generation rate of 0.85 tonnes per person per year (E&DB Internal Report on Ban on Burning, May 1997). Solid Waste Permits are pending - applications were submitted in April 2000.

^(B) Includes landfilling, transfer station, recycling, gatehouse staff.

**Table 5
Solid Waste Facilities
Incorporated Communities**

| LOCATION: | Site Location | Land Zoning | Legal Status | Environmental Monitoring of Soil, Air, Water | Electric Fence in Place | Plans for Expansion/ Modification |
|------------------------|--|---|---|--|-------------------------|---|
| Carmacks | 1.2 km southwest of Village, east side of highway. | Solid Waste Site | | no | no | Major site improvements. |
| Dawson City | a few km south of Town, west side of Klondike Hwy. | YTG Reserve No. MI - Industrial Business | In progress, to be registered lot 11142, C 116B/3 | yes | yes | No-burn operation for domestic waste, Pilot Project work includes composting. |
| Faro | Directly opposite town access road. | Lot 1027 | | no | yes | None at present. |
| Haines Junction | near km 1630 Alaska Hwy. East side. | YTG Reserve No. 023 PD - community use | Pending finalization of Official Community Lot 1083 Qu 115A/13. | no | yes | Moving towards a no-burn operation for domestic waste, Pilot Project work includes preparation of a Waste Management Plan with emphasis on programs that will reduce waste and increase the life of their facility through waste diversion. |
| Mayo | km 49.6 Silver Trail | Federal Reserve 105M12/38 NOZ (no zoning) | | no | yes | None at present. |
| Teslin | 1 km south east of Nisutlin River Bridge | Federal Reserve 105C02/29 | | no | yes | Major site improvements completed in 99/00. |
| Watson Lake | near km 1022 Alaska Hwy north side (Auburn Drive) | Federal Reserve 105A02/42 | | no | no | None at present. |
| Whitehorse | north on Alaska Hwy, first left after Fish Lake Road | Lot 1166 105D/11 Public Utility zoning | | yes | yes | None at present. |

Notes:

(A) As provided by municipalities in Solid Waste Permit Applications (No-Burning, May 1997).
Solid Waste Permits are pending - applications were submitted in April 1997.

(B) Includes landfilling, transfer station, recycling, gatehouse staff.

Table 5
Solid Waste Facilities
Incorporated Communities

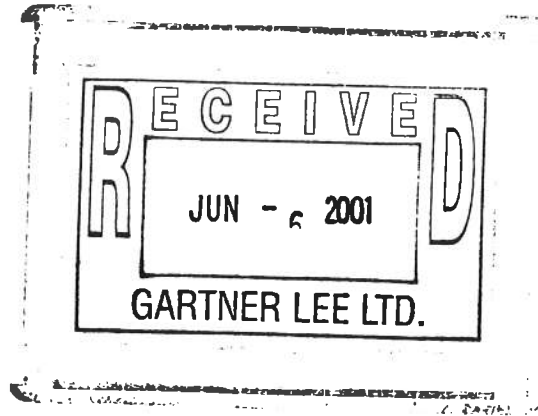


THE VILLAGE OF HAINES JUNCTION

Box 5339 ▪ Haines Junction, Yukon Territory ▪ Canada ▪ Y0B 1L0
Phone: (867) 634-7100 ▪ Fax: (867) 634-2008 ▪ E-mail: vhj@yknet.yk.ca

30th May 2001

Gartner Lee Ltd.,
Sperling Plaza,
6400 Roberts Street, Suite 490,
BURNABY, B. C. V5G 4C9
Attn. Paul Manley



Dear Paul,

Thank you for your visit of today's date and the discussion on landfill operations and transfer stations.

Please find enclosed a copy of the current municipal bylaw on the maintenance and operation of the Village landfill site as requested.

Yours sincerely,


Colin J. Dean
C. A. O.

VILLAGE OF HAINES JUNCTION
BYLAW # 140-99

A bylaw of the Village of Haines Junction to provide for the maintenance and operation of the municipal landfill site.

WHEREAS Section 265 of the Municipal Act, being Chapter 19, Statutes of the Yukon Territory and amendment, authorizes the Council of the Village of Haines Junction to regulate the collection, removal and disposal of garbage, refuse and ashes;

NOW THEREFORE, the Council of the Village of Haines Junction in open meeting assembled, hereby ENACTS AS FOLLOWS:

SHORT TITLE:

1. This Bylaw may be cited as the "Garbage Bylaw".
2. In this bylaw,
 - (a) "APARTMENT BUILDING" means a building consisting of not less than four (4) dwelling units as hereinafter, each of which is occupied as a permanent home or residence of one (1) person or family.
 - (b) "VILLAGE" means the Village of Haines Junction.
 - (c) "COMMERCIAL PREMISES" means a café or restaurant, warehouse, wholesale or retail business place, motel/hotel, office building, garage or service station, factory, or industrial plant, or any other building or premises except a residential dwelling or apartment building.
 - (d) "COMMERCIAL WASTE" means material from excavation; material from lot clearing and building removed, demolished or destroyed by fire or any other cause; material from manufacturing processes; waste from garages and service stations; condemned matter or waste from factories; material from retail outlets or other works, or from warehouses or market gardens; ashes from industrial plants; and other similar waste material other than human or animal excrement, hazardous waste, or garbage.
 - (e) "CONTAINER" means any container other than a garbage can, approved in writing by the Village for the storage of garbage, recyclables, compostables or commercial waste.
 - (f) "CONTROLLED WASTE" means material which must be disposed of according to specific procedures and includes but is not limited to: waste asbestos, animal carcasses, large metallic waste (automobiles, freezers, etc.), grubbing from construction sites, and waste oil.
 - (g) "COUNCIL" means the Council of the Village of Haines Junction.
 - (h) "DWELLING UNIT" means one (1) or several rooms constituting a self-contained unit and used or intended to be used together for living and sleeping purposes by one (1) or more persons.
 - (i) "GARBAGE" means discarded or rejected ashes, soiled disposable diapers, wrapping, sweepings and other items of household refuse, but does not include human or animal excrement, animal carcasses, commercial waste, hazardous waste or recyclables or compostables.
 - (j) "GARBAGE CONTAINER" means a metal or other approved receptacle designed and constructed for the purpose of disposing of garbage and intended for use with a vehicle utilizing a lift mechanism for emptying such containers.

13

- (k) "HAZARDOUS WASTE" means any explosive, flammable, volatile, noxious, radioactive or dangerous device, substance or thing, and includes but is not limited to such items as paint remover, BBQ starter, spray-on oven cleaner.
- (l) "HOUSEHOLDER" means any person occupying any dwelling or place of residence, but shall not include any person who is merely a roomer, boarder, or lodger therein, or any occupant of the apartment house.
- (m) "INDUSTRIAL WASTE" means material from excavation; material from lot clearing and building construction, repairs, alterations, or maintenance; debris from any building removed, demolished or destroyed by fire or any other cause; material from manufacturing processes; warehouses or market gardens; ashes from industrial plants; condemned matter or waste from factories; any other material or waste or by-product of an industrial or related activity.
- (n) "PROPRIETOR" means the occupant of commercial premises and the person in charge of an apartment building and, where such premises are unoccupied, means the owner thereof.
- (o) "RESIDENTIAL DWELLING" means a detached building containing no more than three (3) dwelling units, and may include a single family home, duplex or triplex, mobile home, or modular home.
- (p) "SCAVENGING" means to salvage from discarded or refuse material.
- (q) "SITE ATTENDANT" means a person designated by the Village to supervise the operation of the solid waste disposal site and the dumping of material therein.
- (r) "SOLID WASTE DISPOSAL SITE" means an area designated and established for the use of residents of the area for the disposal of garbage and commercial waste.
- (s) "STREET" means a public thoroughfare having a right-of-way over thirty (30) feet in width, which affords the principal means of access to abutting properties.

GENERAL:

1. For the purpose of fire protection and safety, the Village does not allow burning at the solid waste disposal site.
2. No person shall deposit any garbage or refuse at any time on any access road or driveway to the solid waste disposal site.
3. The following items shall be deposited only in such quantities as approved by the Public Works Department.
 - (a) Lumber or other building material.
 - (b) Brush or other land clearing refuse.
4. No householder, proprietor, or other person shall dispose of garbage or commercial waste in any manner other than:
 - (a) in garbage cans or containers that he supplies for this purpose; or
 - (b) by transporting same to the solid waste disposal site.

1.3

5. Except in accordance with this bylaw, no householder, proprietor, or other person shall dispose of garbage, industrial or commercial waste in any manner other than:
 - (a) by transporting same to the solid waste disposal site.
6. Except as otherwise specifically provided in this bylaw, the collection, removal and disposal of garbage shall be under the supervision of the Village.
7. The removal and disposal of garbage from areas of the Village shall be the responsibility of the owners or proprietors and disposed of only under the direction of the site attendant or in accordance with signs posted on site.
8. No "Scavenging" by unauthorized individuals may take place at the domestic garbage landfill site.
9. The owner, tenant, occupant, or person in charge of a dwelling or other building shall at all times ensure that garbage or commercial waste is kept within the garbage cans or other containers provided for that purpose, and not allowed to spill over or accumulate on any street, or adjoining public or private property. The owner shall be held fully responsible for any violation of this section regardless of the cause of such violation.
10. No person shall directly or otherwise dispose of or permit any person to dispose of any hazardous waste in any garbage can, container or solid waste disposal site, hazardous waste shall be handled and disposed of in accordance with the conditions stipulated by the Village.
11. The Village is hereby authorized to regulate the operation of the solid waste disposal site and the dumping of garbage, industrial waste and commercial waste therein, and to designate as site attendants those persons required to control such operation and dumping.
12. Every person using a solid waste disposal site for the dumping of garbage, industrial waste or commercial waste shall comply with all directions relating to movement of vehicles in the disposal site and the dumping of material, which are given by the site supervisor, or by means of signs erected at the direction of the Village.
13. No person shall operate a vehicle in the Village while it is carrying garbage or industrial or commercial waste unless the portion of the vehicle in which the material is being carried is securely covered, or the material is secured to prevent any part of such material from falling off, or out of, the vehicle while in transit.
 - (a) No person shall leave a vehicle unattended in the portion of the landfill site under control of the attendant or supervision of the Public Works department. Motorized toboggans are prohibited from entering the controlled portion of the site.
14. Notwithstanding any other provision of this bylaw, composting of garden refuse and grass cuttings is acceptable when done in a manner satisfactory to the Village.
 - (a) Placed in the proper designated area of the solid waste site.

APARTMENTS:

15. The owner or operator of every apartment building shall provide sufficient garbage containers to contain the normal garbage generated from those premises and shall provide an enclosure or location satisfactory to the Village to contain such garbage prior to its removal from the premises.

13

COMMERCIAL:

16. No person shall place or keep any garbage can or container for commercial waste upon any lane or street in the Village without first having obtained written permission of the Village, or as specifically provided for in this bylaw.
17. The owner of every commercial premises shall provide sufficient garbage containers to contain the normal garbage generated from those premises and shall provide an enclosure or location satisfactory to the Village to contain commercial waste.
18. The removal of commercial waste from commercial and other premises and the full cost thereof shall be the sole responsibility of the proprietor or owner of such premises.
19. For the purpose of facilitating waste diversion and recycling activities, all commercial and institutional users must separate cardboard and other recyclables as identified by Council resolution, prior to delivering it to the waste management site.

INDUSTRIAL:

20. The removal and disposal of industrial waste shall be the sole responsibility of the proprietor or producer of such waste.
21. Those persons wishing to dispose of industrial waste in any solid waste disposal site shall first contact the Village for written permission.
22. The Village reserves the right to control the type, nature and volume of industrial waste which is deposited in any solid waste disposal site.

VIOLATION:

23. Every person who violates any provision of this bylaw is guilty of an offence and liable on summary conviction on a first offense under this bylaw, to a fine of not less than One Hundred Dollars (\$100.00) and not exceeding Two Hundred Dollars (\$200.00) or to imprisonment as set out in the Summary Convictions Act of the Yukon. On the summary conviction for a second or subsequent offense under this bylaw the person so responsible is liable to a fine of not less than Two Hundred Dollars (\$200.00) and not more than Five Hundred Dollars (\$500.00) or to imprisonment as set out in the Summary Convictions Act of the Yukon
24. The invalidity of any section, clause, sentence, or provision of this bylaw shall not affect the validity of any other part of this bylaw which can be given effect without such invalid part or parts.
25. This bylaw shall come into full force and effect on the final passing thereof.

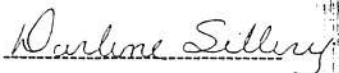
Read a First Time this the 27th day of October 1999

Read a Second Time this the 27th day of October 1999

Read a Third Time and Finally passed this the 10th day of November 1999



Mayor Burton



Municipal Clerk

Appendix E

Information re: Charge Up to Recycle

Recycle your rechargeable batteries.

The Rechargeable Battery Recycling Corporation (RBRC) can help you recycle your portable rechargeable batteries. These batteries are commonly found in cordless power tools, cellular and cordless phones, laptop computers, camcorders, digital cameras, and remote control toys. RBRC recycles the following portable rechargeable battery chemistries:

- Nickel Cadmium (Ni-Cd)
- Nickel Metal Hydride (Ni-MH)
- Lithium Ion (Li-ion)
- Small Sealed Lead (Pb)*

* weighing less than 2 lbs./1 kg.

Consumer
Click here to find the battery collection sites nearest you



RBRC Spokesperson
Richard Karn, "Al" from
TV's *Home Improvement*

our latest TV commercial in QuickTime



Click here to see when it airs.

RBRC
RECHARGEABLE
BATTERY
RECYCLING
CORPORATION

RBRC
Click here for an overview of our rechargeable battery recycling programs and press information.

OEM/Licensee
Click here if you make or market rechargeable batteries or the products that use them.

Retail
Sign up to become a battery collection site and order support materials.

Business/Public Agency
Sign up to collect rechargeable batteries at your business location and order support materials here.

Community
Get your community involved by recycling rechargeable batteries. Sign up online and order support materials here.

Teaching Resources
Teachers can download our free Battery Lesson Plan and order support materials.

Français
Cliquez ici pour en savoir davantage sur nos programmes de recyclage des piles rechargeables au Canada.

Español
Pulse aquí para informarse sobre el programa.

Rechargeable Battery Recycling Corporation. Copyright © 2001. RBRC is a non-profit, public service organization created to promote the recycling of portable rechargeable batteries.

RBRC
RECHARGEABLE
BATTERY
RECYCLING
CORPORATION

- Home
- Site Map
- How the Program Works
- FAQs
- Battery Tips
- Related Sites
- Contact Us



“Help me recycle rechargeable batteries!”

Hi there! You may know me as “Al”, from TV’s *Home Improvement* - but I’m also the corporate spokesperson for the Rechargeable Battery Recycling Corporation (RBRC). Our mission is to preserve our environment by recycling the following portable rechargeable batteries:

- Nickel Cadmium (Ni-Cd)
 - Nickel Metal Hydride (Ni-MH)
 - Lithium Ion (Li-Ion)
 - Small Sealed Lead* (Pb)
- * weighing up to 2lbs/1kg per battery
- These rechargeable batteries can be found in cordless power tools, cellular and cordless phones, laptop computers and camcorders.

Find the drop off location nearest you!



Please click on your country of residence.



If the seal is on it, we recycle it!

To find a rechargeable battery drop-off site near you, simply click on the star or maple leaf to your left or call our helpline, 1-800-8-BATTERY.

Rechargeable Battery Recycling Corporation. Copyright © 2001. RBRC is a non-profit, public service organization dedicated to the recycling of rechargeable batteries.

"Just a hunch,
but I'll bet you want to
know more about
how our rechargeable
battery recycling
program works!

Just roll your cursor
over each number
and we'll tell you
all about it..."



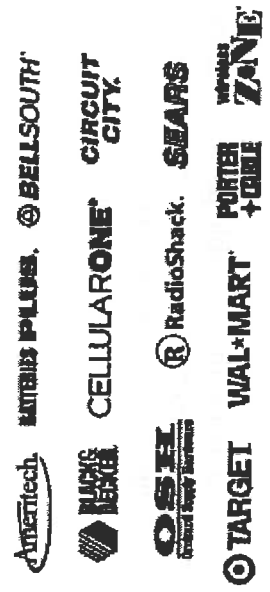
**Where to find
rechargeable batteries.**

Your cordless power tools, cellular and cordless phones, laptop computers and camcorders use rechargeable batteries. But eventually the batteries can no longer hold a charge and they need to be recycled.



This program is funded by the rechargeable power industry. Please support these companies who care about our environment. For a complete list of participating companies, [click here](#). For a complete list of RBRC National Retail Participants, [click here](#).

RBRC National Retail Partners - United States



RBRC National Retail Partners - Canada



[Back to top](#)

[Home](#) | [Sitemap](#) | [How the Program Works](#) | [FAQ's](#)
[Battery Tips](#) | [Related Sites](#) | [Contact Us](#)

"Here's a list of
collection sites
closest to you."

Home

Site Map

How the
Program
Works

FAQs

Battery Tips

Related Sites

Contact Us

| | |
|---|---|
| Canadian Tire 4201 4th Avenue Whitehorse, Yukon Territory Y1A 5A1 403-668-3652 | Erik's Home Entertainment 303 Main Street Whitehorse, Yukon Territory Y1A 2B3 403-668-6543 |
|---|---|



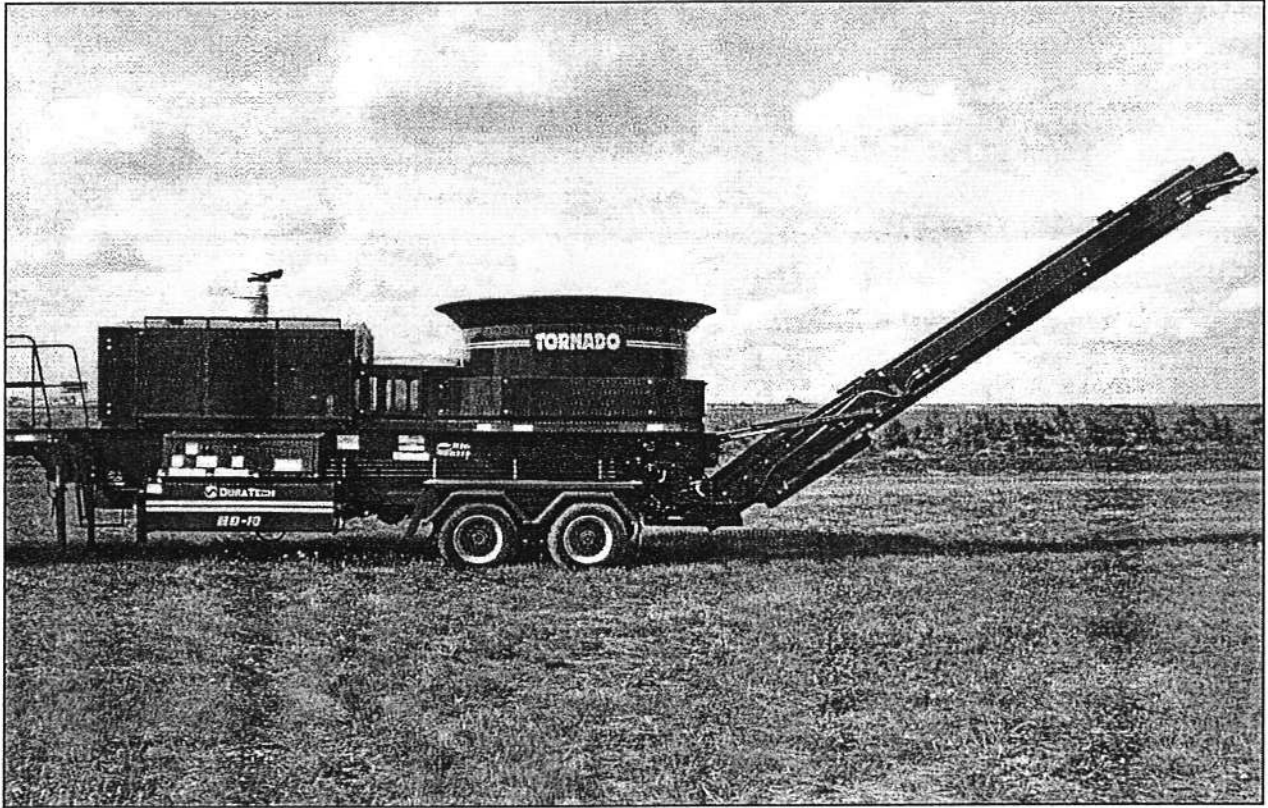
Display List in Window

You can also drop off your used rechargeable batteries
at any of the following retail stores:



Appendix F

Photo of Tub Grinder



Industrial Tub Grinder

