Scrap Metal Recovery and Recycling in Northern Alberta and the Northwest Territories

Final Report
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Prepared by

Recycling Council of Alberta

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1 Executive Summary

With collection and processing options already in place, scrap metal recycling in southern Alberta is an established industry. The relatively low cost of collection and transportation of scrap in the south makes it a profitable endeavor for private businesses. Recycling in Northern Alberta and the Northwest Territories (NWT), however, presents numerous challenges which increase costs, making scrap metal recycling not always profitable for communities or private businesses. This is especially prevalent in the Northwest Territories, where long distances and lower scrap metal volumes discourage processors.

The majority of Northern Alberta communities have processors remove scrap metal at least twice a year, usually in the spring and fall, while larger populations have processors visit three or four times annually. With the exception of Yellowknife, the majority of Northwest Territories communities have stockpiled scrap metal for years.

An estimated 627 tonnes (T = metric tonne) of auto hulks, 470 tonnes of white goods, and 3,703 tonnes of ferrous/non-ferrous scrap metal are presently stockpiled in Northern Alberta, while roughly 2,651 tonnes of auto hulks, 68 tonnes of white goods, and 30,325 tonnes of ferrous/non-ferrous scrap metal are currently stockpiled in the Northwest Territories.

Stockpiled quantities of scrap metal in Alberta represent a potential reduction in greenhouse gas (GHG) emissions of 6,000 to 8,000 tonnes eCO_2, while NWT stockpiles represent potential reductions of 43,000 to 57,000 tonnes eCO_2. Given the extra long haul from the far north, it is possible that the GHG emission reductions are over-estimated. However, the upstream benefits of recycling (re: resource extraction) far outweigh the negative impacts of transportation (ICF Consulting, 2005).

This report focuses on the following topics:

- Existing and related scrap metal recovery programs and associations
- Northern Alberta and Northwest Territories stockpiled scrap metal survey results
- Greenhouse gas diversion potential from scrap metal recovery
- Scrap Metal Recovery in the Northwest Territories Stakeholder Workshop
- Transportation and processing/market options
- Opportunities for financial assistance
- Recommendations for scrap metal recovery in the Northwest Territories

Based on the research conducted for this project, as well as feedback received through the survey and workshop, the following recommendations are being presented to further scrap metal recycling in the Northwest Territories:

Communication / Education

1) Encourage communities to allocate funding in their annual budgets for scrap metal recycling.
2) Standardize scrap metal recovery practices to provide increased regional opportunities.
3) Develop an education program for the public and politicians that centers on repairing, reuse, and sorting scrap metal.

Governance

1) Provide government leadership through procurement practices that encourage product stewardship and enhanced scrap metal recycling.
2) Foster partnerships between industry, government, and local communities.
3) Consider opportunities for incentive-based approaches to encourage increased scrap metal recycling, including the following:
   - Expansion of the Waste Recovery and Recycling Act to include white goods as a deposit program
   - Regional landfill bans
   - Differential tipping fees to encourage source separation/ recycling

Planning

1) Establish a NWT scrap metal recycling plan, based on a regional approach with two primary transportation hubs (Hay River and Tuktoyaktuk), and additional transportation nodes (Fort Simpson or Fort Providence, Norman Wells, and Inuvik) to facilitate participation from smaller communities (see Figure 9).
2) Establish program based on three regions: Inuvik area (Fort McPherson, Tsiigehtchic, Inuvik, Tuktoyaktuk), Sahtu area (Fort Good Hope, Norman Wells, Tulita, Wrigley), and North Slave Lake area (Yellowknife, Behchoko, Fort Simpson, Fort Liard, Fort Providence, Hay River, Enterprise, Fort Resolution, Fort Smith).
3) Provide overall program facilitation through the Territorial Government (Municipal and Community Affairs), with dedicated coordinators from each region.
4) Develop the scrap metal plan in two stages:
   - Cleanup of existing stockpiles
   - Implementation of ongoing program including front-end sorting, processing, and transportation
5) Consider potential to phase in territorial program over time, starting with larger communities and adding smaller and more remote locations.
6) Establish a resource recovery fund to assist with program costs (and consider how these funds would be accrued – ties in with governance incentive-based approaches).
7) Pursue backhauling opportunities with transportation providers (e.g., backhauls from diamond mines north of Yellowknife).

2 Scrap Metal Recycling in Canada

It is estimated that 10 million tonnes of ferrous and non-ferrous scrap metal are recycled in Canada annually (Natural Resources Canada, 2007a) with an estimated 92% of appliances and 98% of cars recycled (Canadian Appliance Manufacturers Association, Hanson Research + Communications and Hilkene International Policy, 2005; Canadian Steel Producers Association, 2007a). In Alberta, 95,916 tonnes of ferrous metal, 11,447 tonnes of mixed metal, and 12,108 tonnes of white goods were collected by either a private sector hauler or a local government organization for recycling in 2004 (Statistics Canada, 2007).

Canada's metal recycling sector is both mature and extensive, comprising in excess of 2,800 businesses (Natural Resources Canada, 2007b). Virtually every major Canadian community has local metal processors. Given the enormous global demand for scrap metal, the value of all scrap metal types have never been as high as they are now. For more information about the trade in recycled metals, consult the 2005 Canadian Minerals Yearbook.

The most recycled material in the world is steel, with more recovered annually in Canada than aluminum, glass, and paper combined (Canadian Steel Producers Association, 2007a). Steel is also recycled five times more than the sum of all other metals (e.g., aluminum, copper, lead, nickel, chromium, and zinc) (Canadian Steel Producers Association, 2007b).

In Canada, steel has a recycling rate of more than 65% and – like all metals – is 100% recyclable (Canadian Steel Producers Association, 2007a). Two processes are used to make steel: the Basic Oxygen Furnace and the Electric Arc Furnace, utilizing a minimum of 25% recycled steel and nearly 100% recycled steel, respectively (Dofasco, 2007).

Steel recycling contributes to an energy savings equivalent of electrically powering one-fifth of Canadian households for one year, and reduces demand for virgin resources; every ton of steel recycled saves 2,500 lbs of iron ore, 1,400 lbs of coal, and 120 lbs of limestone (Canadian Steel Producers Association, 2007b).

Every tonne of primary aluminum requires many different inputs including but not limited to 5,168 kg of bauxite, 159 kg of caustic soda, 349 kg of petrol coke, and 40.5 cubic metres of water (International Aluminum Institute, 2003). From an energy use perspective, every tonne of rolled aluminum made from virgin inputs requires about 120 gigajoules (GJ) (ICF Consulting, 2005). The energy use for the same rolled product using 100% recycled feedstock is about 17 GJ per tonne. The energy savings are therefore 103 GJ (or 95,790 cubic feet of gas) when aluminum scrap is recycled. In comparison, the average Canadian home uses about 148 GJ per year (Canadian Residential Energy End-use Data and Analysis Centre, 1997).

3 Benefits of Recycling Scrap Metal

Scrap metal recovery has numerous benefits:

1) Saves energy, reducing greenhouse gas emissions
2) Conserves natural resources and reduces the impact of resource extraction on the environment
3) Reduces landfill waste, including old cars and discarded household items
4) Creates employment opportunities
5) Contributes to community pride (improves aesthetics, as less scrap metal is left along roadsides or on private property)

4 Related Regulations and Requirements

This section discusses regulations relevant to scrap metal recycling, including environmental acts, regulations relating to hazardous waste disposal at landfills, and transportation cargo securement.

4.1 Alberta

At this time Alberta has no regulations for auto hulks, white goods, and ferrous/non-ferrous scrap metal recovery other than "no person shall dispose of hazardous waste into a landfill" as stated in the *Environmental Protection and Enhancement Act, Waste Control Regulation* (Alberta Government, 1996). As such, all hazardous waste components must be removed if scrap metal is to be landfilled.

In Alberta, it is common practice that processors prohibit scrap metal containing potentially hazardous materials such as ballasts, batteries, capacitors, and mercury. This topic is discussed further in Section 9: Scrap Metal Processing and Markets.

Although this project focuses on auto hulks, white goods, and ferrous/non-ferrous scrap metal, within Alberta's *Environmental Protection and Enhancement Act,* several regulations have initiated stewardship programs to divert oil and other types of metal:

- *Beverage Container Recycling Regulation (AR 128/1993)*
- *Electronics Designation Regulation (AR 94/2004)*
- *Lubricating Oil Material Recycling and Management Regulation (AR 82/1997)*
- *Tire Designation Regulation (AR 95/2004)*

On February 1, 2005, Alberta adopted the National Safety Code Standard 10 (Cargo Securement) as part of the *Cargo Securement Regulation (AR1/2005)* for transporting goods. This standard specifies how a commercial vehicle registered for more than 4,500 kg must transport cargo and includes detailed procedures for vehicles. The adoption of this standard has increased costs for transportation providers, as expensive cargo-netting must now be purchased. Commercial vehicles registered in Alberta for 4,500 kg must also secure their cargo to meet section 65 of the *Vehicle Equipment*

Regulation (AR322/2002), whereas small vehicle operators are recommended to follow Standard 10 criteria.

A copy of Standard 10 is located at www.ccmta.ca/english/pdf/Standard%2010.pdf, while the *Cargo Securement Regulation (AR1/2005)* and *Vehicle Equipment Regulation (AR322/2002)* are found at www.qp.gov.ab.ca/documents/Regs/2005_001.cfm?frm_isbn=0779734807 and www.qp.gov.ab.ca/documents/Regs/2002_322.cfm?frm_isbn=0779717090, respectively.

4.2 Northwest Territories

The *Waste Reduction and Recovery Act*, implemented in 2005, covers the *Beverage Container Regulation*. During the fall of 2007, public consultation regarding *Waste Reduction and Recovery Act* expansion is anticipated. Potential materials to be considered include scrap metal (e.g., white goods and 45-gallon drums), tires, electronics, and grocery bags (Paquin, 2007).

Under the *Environmental Protection Act*, the *Guideline for the General Management of Hazardous Waste* (February 1998) states "it is not acceptable for hazardous waste to be abandoned, poured down sewers, dumped on land or discarded at a landfill" (GNWT, 1998), therefore all hazardous waste materials must be removed if scrap metal is to be landfilled. Similar to Alberta, potential hazardous waste must be removed before scrap metal is processed for recycling.

Additionally, the *Used Oil and Waste Fuel Management Regulations* (November 2003), the *Guideline for Industrial Waste Discharges* (February 1998), and the *Guideline for the Management of Waste Batteries* (September 1998) are all under the *Environmental Protection Act*.

Meanwhile, the *Large Vehicle Control Regulations (RRNWT 1990 c, M-30),* under the *Motor Vehicles Act,* describe load security requirements for vehicles exceeding 4,500 kg. As with Alberta, the load must meet criteria set forth by the National Safety Code Standard 10 (Cargo Securement). A copy of the Large Vehicle Control Regulation is located at http://www.canlii.org/nt/laws/regu/m-30/20070329/whole.html.

5 Existing Scrap Metal Recycling Programs and Associations

This section examines current scrap metal recovery practices in Northern Alberta and the City of Yellowknife along with related associations and programs.

5.1 Northern Alberta

In Northern Alberta, processors normally remove scrap metal twice a year from staging areas, usually in the spring and fall, while processors for large municipalities visit three or four times annually. Metal is crushed on site and transported by processors to recyclers. In most cases, processors are on site a minimum of two weeks and costs range from $5.50-$33/tonne.

All Northern Alberta landfills and transfer stations ban auto hulks in principal. This includes Grande Prairie, Boyle, Grimshaw, the Regional Municipality of Wood Buffalo, Fort McMurray, Cold Lake, Manning, and Nampa where residents deliver auto hulks directly to local auto wreckers for salvaging and recycling. The Athabasca Waste Commission Management Services, County of Grande Prairie, MD of Peace River, Grande Cache, Lac La Biche, and Slave Lake are the exception and accept auto hulks for $20-$25/vehicle at landfills and transfer stations.

Métis Settlements have auto hulk round-ups as required. Typically, Settlements contact local and Edmonton auto wreckers to tender the work and select a processor that sets aside a week to collect all auto hulks. There is no cost to the Settlement or residents; in fact, residents are paid from $20-$35, depending on vehicle condition.

5.2 City of Yellowknife

Many Northwest Territories communities have stockpiled scrap metal for years, if not decades. Of all NWT communities, Yellowknife has the most progressive scrap metal recycling program. The landfill, located at the Yellowknife Solid Waste Facility, started recovering white goods in 1997, expanded to auto hulks in 2003, and added light steel in 2005.

Scrap metal is currently sorted into three areas: auto hulks, white goods, and ferrous/non-ferrous metal, with an estimated 3,618 tonnes diverted to southern recyclers between 2000 and 2006.

Table 1 describes the number and tonnage of auto hulks, white goods, and light steel metal processed and transported to metal recyclers from the Yellowknife landfill.

Table 1: Yellowknife Landfill – Number and Tonnes of Auto Hulks, White Goods, and Light Metal Recycled

Year	Auto Hulks		White Goods[2]		Light Steel from Ferrous Metal Pile	
	Number of Auto Hulks	Tonnes[1]	Number of Bales	Tonnes[3]	Number of Bales	Tonnes[4]
2000	0	0	84	84		
2001	0	0	126	126		
2002	0	0	127	127		
2003	900	1,350	144	144		
2004	0	0	0	0		
2005	550	825	348	348	770	477
2006	0	0	137	138		
Total	1,450	2,175	966	966	770	477

[1]One average auto hulk is estimated to be 1.5 tonnes (Kerbs, 2007a)
[2]Data collection started in 2000
[3]One bale of white goods is estimated to be 1 tonne (Underhay, 2007)
[4]Personal communication (Underhay, 2007)

(Underhay, 2007)

Due to mechanical difficulties, no white goods were processed in 2004, which accounts for a significant increase of baled white goods in 2005.

As of March 31, 2007, the City of Yellowknife has baled 37 tonnes of white goods and has released a tender for 750 tonnes of auto hulks to be processed and transported to recyclers (Underhay, 2007).

More detailed information regarding Yellowknife's scrap metal recovery program is located in Appendix A.

5.3 Related Associations and Programs

Several associations and programs are related directly to scrap metal recovery and hazardous waste disposal from scrap metal products.

1) Alberta Automotive Recyclers and Dismantlers Association

   A group of automotive recyclers and dismantlers that, when possible, recover all material and effluents associated with recycled vehicles.

   www.aarda.com
   aarda@shawbiz,ca

2) Automotive Recyclers of Canada

National voice of automotive recyclers that provides a forum for information distribution and addresses Canada-wide concerns. The Alberta Automotive Recyclers and Dismantlers Association is a member of this organization.

www.autorecyclers.ca
info@autorecyclers.ca
T: (519) 858-8761

3) Car Heaven

A Clean Air Foundation initiative, designed to accelerate the retirement of older, high-polluting vehicles and ensure they are recycled in an environmentally responsible manner. In 2004, Car Heaven was launched in Calgary and Edmonton.

In order to be eligible for a $1,000 incentive, six months of transit passes or a maximum $300 bike credit, vehicles must be 1995 or older, currently registered in Alberta, and registered and insured in Alberta for the previous consecutive six months in the donor's name. Additionally, vehicles must be driven to the drop-off location (cannot be towed).

www.carheaven.ca
T: (888) 441-2277
T: (780) 408-4580

4) Switch Out

Switch Out is a Canada-wide voluntary program, managed by the Clean Air Foundation that collects mercury-containing switch pellets from vehicles before they enter the waste stream. This program is dedicated to safely and effectively reducing the amount of mercury entering the environment from the automotive recycling sector. As of May 31, 2007, this program has collected 149,744 switches or 127 kg of mercury since the spring of 2001. Switch Out started in Ontario then expanded to British Columbia, Alberta, Quebec, and the Maritime provinces respectively.

www.cleanairfoundation.org/switchout/
T: (416) 922-9038 ext. 257

5) Refrigerant Management Canada

Refrigerant Management of Canada manages the environmentally responsible disposal of Canada's surplus ozone depleting substances (ODS) for the Canadian refrigeration and air conditioning industries. A formal process for collection, transportation, storage, and disposal of surplus ODS refrigerants is funded through an environmental levy ($1.50/kg) submitted by refrigerant manufacturers, importers, and reclaimers on sales of hydrochloroflurocarbons refrigerants (e.g., R-22).

www.hrai.ca/rmc
rmc@hrai.ca
T: (866) 622-0209
T: (905) 361-1165

6 Northern Alberta and Northwest Territories Scrap Metal Survey Results and Greenhouse Gas Emission Reductions

Survey results indicate that Northern Alberta communities are very pro-active with scrap metal recovery, while Northwest Territories communities typically stockpile metal for years. Additionally, Northwest Territories communities have numerous barriers that limit scrap metal recovery and are keen to receive any assistance with recycling options.

6.1 Methodology

In early 2007, communities, counties, municipal districts, regional municipalities, the territorial government, and waste management commissions were contacted regarding current scrap metal stockpiles in Northern Alberta and the Northwest Territories.

This telephone survey covered a variety of topics including the following:

- Contact information
- Existing scrap metal stockpiles and quantity (if available)
- Sorting practices
- Desire and plans to recycle scrap metal
- Challenges or barriers to scrap metal recovery
- Changes to enable more scrap metal recovery

Only communities close to major transportation routes (i.e., road and waterway) were approached for this survey. These communities account for approximately 86% of the NWT total population.

Scrap metal terminology used for the survey focus on the following stockpile categories:

Auto Hulks – old vehicles

Ferrous Metal – steel and iron products (excluding auto hulks and white goods)

Non-ferrous Metal – aluminum, brass, copper, lead, nickel, tin, titanium, and zinc products are examples; basically all metal other than steel and iron (although stainless steel is considered it falls in the non-ferrous category given its high chromium and nickel content).

White Goods – old refrigerators, stoves, dishwashers, dryers, clothes washers, and hot-water heaters

Appendix B contains a copy of the survey, and the survey results database is also available and has been submitted as an attachment.

6.2 Overview of Northern Alberta Scrap Metal Recovery Survey Results

Northern CARE surveyed 43 members, while the Recycling Council of Alberta contacted 8 additional northern communities/municipal districts, to complete the scrap metal recovery survey:

Communities

- City of Cold Lake
- City of Fort McMurray
- City of Grande Prairie
- Town of Athabasca
- Town of Beaverlodge
- Town of Bonnyville
- Town of Fairview
- Town of Falher
- Town of Fox Creek
- Town of Grande Cache
- Town of Grimshaw
- Town of High Prairie
- Town of Manning
- Town of McLennan
- Town of Lac La Biche
- Town of Peace River
- Town of Sexsmith
- Town of Slave Lake
- Town of Swan Hills
- Town of Valleyview
- Town of Wembley
- Town of Whitecourt
- Village of Berwyn
- Village of Boyle
- Village of Hythe
- Village of Kinuso
- Village of Nampa

Counties, Municipal Districts (MD) and Regional Municipalities (RM)

- Birch Hill County
- Clear Hills County
- County of Athabasca
- County of Grande Prairie
- Lakeland County
- MacKenzie County
- MD of Big Lakes
- MD of Bonnyville
- MD of Fairview #136
- MD of Greenview
- MD of Lesser Slave Lake #124
- MD Northern Lights #22
- MD of Opportunity #17
- MD Peace River #135
- MD Spirit River #133
- Northern Sunrise County
- RM of Wood Buffalo
- Saddle Hills County
- Woodlands County

Métis Settlements

- Buffalo Lake Métis Settlement
- Kikino Métis Settlement

Waste Management Commissions

- Athabasca Waste Commission Management Services
- Long Lake Regional Waste Management Commission
- MacKenzie Regional Waste Management Commission

Figure 1 defines the Northern Alberta study area where roads are the main mode of transportation.

Figure 1: Northern Alberta Study Area

Auto hulks, white goods, and ferrous/non-ferrous metal are collected by the majority of respondents. However, it is noted that several communities, including Grande Prairie, Boyle, Grimshaw, the Regional Municipality of Wood Buffalo, Fort McMurray, Cold Lake, Manning, and Nampa do not collect auto hulks at the landfill or transfer station. Additionally, the Grimshaw transfer site does not accept ferrous/non-ferrous metal.

Typically, scrap metal is separated when stockpiled. An estimated 627 tonnes of auto hulks, 470 tonnes of white goods, and 3,703 tonnes of ferrous/non-ferrous scrap metal is presently stockpiled in Northern Alberta. In several cases the respondent was not aware of the amount of stockpiled metal. Additionally, in 2006 roughly 8,929 tonnes of scrap metal was diverted from landfill disposal in Northern Alberta.

Table 2 provides a break down of stockpiled metal in surveyed communities by type.

Table 2: Stockpiled Metal by Type in Northern Alberta

Municipality / Municipal District / County / Settlement	Scrap Metal Diverted in 2006 (T)	Stockpiled Scrap Metal			
		Auto Hulk[1] (T)	White Goods[2] (T)	Ferrous / non-ferrous[3] (T)	Total/ Com-munity (T)
Athabasca Waste Commission Management Services		0	5	100	**105**
Buffalo Lake Métis Settlement	22	0	1	4	**5**
City of Cold Lake		18	7	28	**53**
City of Fort McMurray	2,000	0	1		**1**
City of Grande Prairie	1,000	0	33	600	**633**
County of Athabasca	33	0	0	0	**0**
County of Clear Hills	992	38	111	1,322	**1,471**
County of Grande Prairie		24	22	110	**156**
Kikino Métis Settlement		8	0		**8**
Lakeland County	18	9	11	6	**26**
MacKenzie County	33	9	11	6	**26**
MD of Big Lakes	400	5	15	10	**29**
MD of Bonnyville	60	12	15	75	**102**
MD of Fairview #136	631	9	10	150	**169**
MD of Greenview	413	300	52	28	**379**
MD of Lesser Slave #124	276	9	7	28	**44**
MD of Northern Lites #22			1	20	**22**
MD of Opportunity #17		45	30	83	**157**
MD of Spirit River (No. 133)					**0**
MD Peace River #135		9	4		**13**
Northern Sunrise County	336	0	5	7	**11**
RM of Wood Buffalo		60	74	300	**434**
Saddle Hills County		5			**5**
Town of Athabasca	110	0	0	0	**0**
Town of Beaverlodge		0	0	0	**0**
Town of Bonnyville	55	18	4	25	**47**
Town of Fairview		0	0	0	**0**
Town of Falher		0	0	0	**0**
Town of Fox Creek	120	12	1	44	**58**
Town of Grande Cache	83	6	0	28	**34**
Town of Grimshaw		0	0	0	**0**
Town of High Prairie		0	0	0	**0**
Town of Lac La Biche	2,204	3	11	110	**124**

Municipality / Municipal District / County / Settlement	Scrap Metal Diverted in 2006 (T)	Stockpiled Scrap Metal			
		Auto Hulk[1] (T)	White Goods[2] (T)	Ferrous / non-ferrous[3] (T)	Total/ Com-munity (T)
Town of Manning		2			**2**
Town of McLennan		2	0	75	**76**
Town of Peace River		0	0	0	**0**
Town of Sexsmith		0	0	0	**0**
Town of Slave Lake		0	0	0	**0**
Town of Swan Hills		8	6	6	**19**
Town of Valleyview	83	5	15	110	**130**
Town of Wembley		0	0	0	**0**
Town of Whitecourt					**0**
Village of Berwyn		0	0	0	**0**
Village of Boyle		0	4	110	**115**
Village of Hythe		0	0	0	**0**
Village of Kinuso		0	0	0	**0**
Village of Nampa		3	1		**4**
Woodlands County	61	12	11	320	**343**
Total/Item	**8,929**	**627**	**470**	**3,703**	

[1]One average auto hulk is estimated to be 1.5 tonnes (Kerbs, 2007a)
[2]One white good is estimated to be 74 kg (Canadian Appliance Manufacturers Association, Hanson Research + Communications and Hilkene International Policy, 2005)
[3]Scrap metal density is based on 801 kg/m^3 (Wilson, 1977)

98% of Northern Alberta communities show interest in recycling scrap metal, while 76% of respondents either recycled scrap metal recently or have plans to recycle stockpiles in the near future.

Barriers, stated by respondents regarding scrap metal recovery include:

- Cost; no charge for scrap metal processing and transportation when metal price is high (x2)
- Minimal sorting takes place; some metal is left behind by processor (x2)
- Hard to schedule a date with processor
- Lack of reuse education (e.g., corrugated steel pipe products used as part of a wine cellar)
- Low scrap metal volumes; difficult to entice processor

Figure 2 summarizes responses for promoting scrap metal recycling from respondents. Education, manned landfill/transfer sites, regulating native reserves, and completing a waste audit are the most recommended ideas.

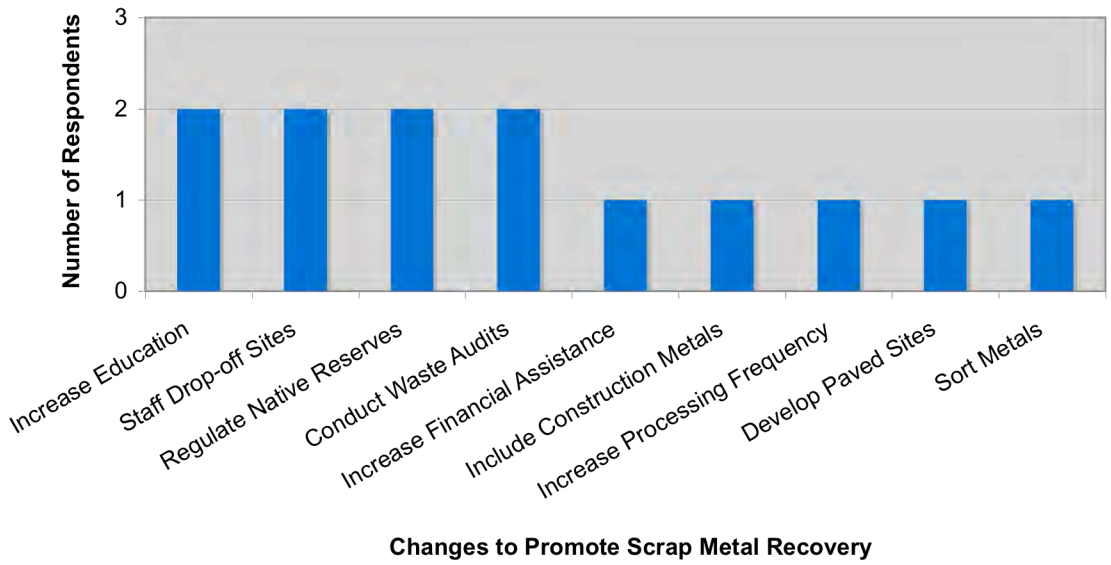

Figure 2: Suggested Changes to Promote Scrap Metal Recycling in Northern Alberta

Overall, Northern Alberta is very pro-active with scrap metal recovery.

6.3 Overview of Northwest Territories Scrap Metal Recovery Survey Results

Sixteen communities and two Government of the Northwest Territories (GNWT) employees were contacted by telephone to complete the scrap metal recovery survey:

Communities

- Charter Community of K'asho Got'ine (Fort Good Hope)
- Charter Community of Tsiigehtchic
- City of Yellowknife
- Hamlet of Behchoko
- Hamlet Fort Liard
- Hamlet of Fort McPherson
- Hamlet of Fort Providence
- Hamlet of Tulita
- Pehdzeh Ki Dene Band (Wrigley)
- Settlement Corporation of Fort Resolution
- Settlement of Enterprise
- Town of Fort Smith
- Town of Hay River
- Town of Inuvik
- Town of Norman Wells
- Village of Fort Simpson

GNWT Departments

- Environment and Natural Resources
- Transportation, Policy, and Planning

Only communities close to major transportation routes (i.e., road and waterway) were surveyed for this project. With the exception of Inuvik, Fort McPherson, Tsiigehtchic, and Fort Liard, all surveyed communities use either road (summer or winter), or barge and road routes to transport freight into Alberta. Meanwhile, the previously mentioned communities use roads to transport goods through the Yukon into British Columbia or directly into British Columbia. Figure 3 shows the Northwest Territories study area with the surveyed communities highlighted in yellow.

Figure 3: Northwest Territories Study Area

(Yukoninfo, 2007)

Some communities bury all metal or only white goods. The remainder of the communities typically sort and stockpile metal based on type.

Auto hulks, white goods, and ferrous/non-ferrous metal is collected by the majority of communities, however, in numerous cases the respondent could not define the amount of metal stockpiled due to:

1) Site is covered by snow
2) Respondent is new to the position
3) Respondent did not visit the site recently

From the data available, approximately 2,651 tonnes of auto hulks, 68 tonnes of white goods, and 30,325 tonnes of ferrous/non-ferrous scrap metal is currently stockpiled in the Northwest Territories. Also noted is that the Government of the Northwest Territories' Transportation Department has 4-8 bridges, 2 communication

towers, 1 dock, and hundreds of drums available for recycling at a variety of sites in the southern NWT.

Table 3 provides a break down of stockpiled metal in surveyed communities by type.

Table 3: Stockpiled Metal by Type in the Northwest Territories

Community	Auto Hulk[1] (T)	White Goods[2] (T)	Ferrous/ non-ferrous[3] (T)	Total/ Community (T)
Charter Community of K'asho Got'ine (Fort Good Hope)	150	7		**157**
Charter Community of Tsiigehtchic			774	**774**
City of Yellowknife	750	37	25,147	**25,934**
GNWT - Transportation	150			**150**
Hamlet of Behchoko	150			**150**
Hamlet of Fort Liard	30			**30**
Hamlet of Fort McPherson	38		16	**54**
Hamlet of Fort Providence	113	4	254	**371**
Hamlet of Tulita	38			**38**
Pehdzeh Ki Dene Band (Wrigley)	9	1	1	**11**
Settlement of Enterprise	9	1		**10**
Town of Fort Smith	1,125		3,572	**4,697**
Village of Fort Simpson	90	19	561	**670**
Total/Item	**2,651**	**68**	**30,325**	

[1]One average auto hulk is estimated to be 1.5 tonnes (Kerbs, 2007a)
[2]One white good is estimated to be 74 kg (Canadian Appliance Manufacturers Association, Hanson Research + Communications and Hilkene International Policy, 2005)
[3]Scrap metal density is based on 801 kg/m^3 (Wilson, 1977)

100% of respondents are interested in recycling scrap metal, however, only Yellowknife plans to crush auto hulks and bale white goods in 2007. There is also the potential for a regional scrap metal recovery program involving Hay River, Fort Smith, Fort Simpson, Fort Providence, Enterprise, and Yellowknife. To date, no significant strategy has developed.

As viewed by survey respondents, the main barriers to recycling scrap metal are cost, volume, and transportation logistics as presented in Figure 4. It is interesting to note that the main concerns of the NWT (cost, material volume, and transportation logistics) are quite different than those expressed by Northern Alberta residents (see Figure 2).

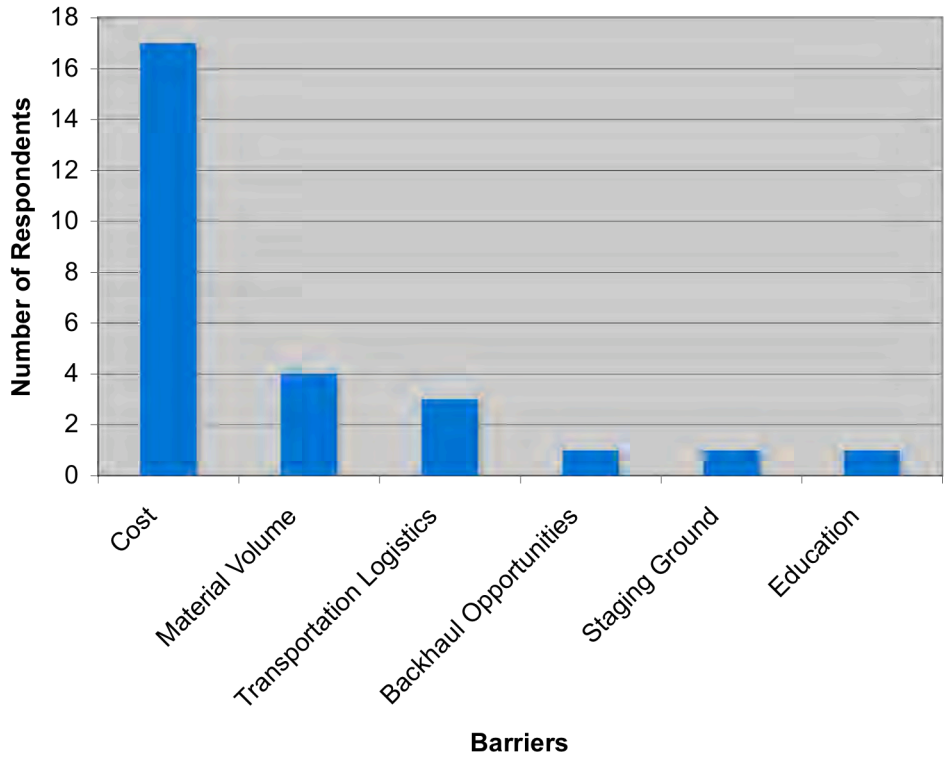

Figure 4: Barriers to Scrap Metal Recovery in the Northwest Territories

Figure 5 summarizes responses for promoting scrap metal recycling from respondents. Financial assistance, increased scrap metal volumes, resources, and legislation are the primary suggestions.

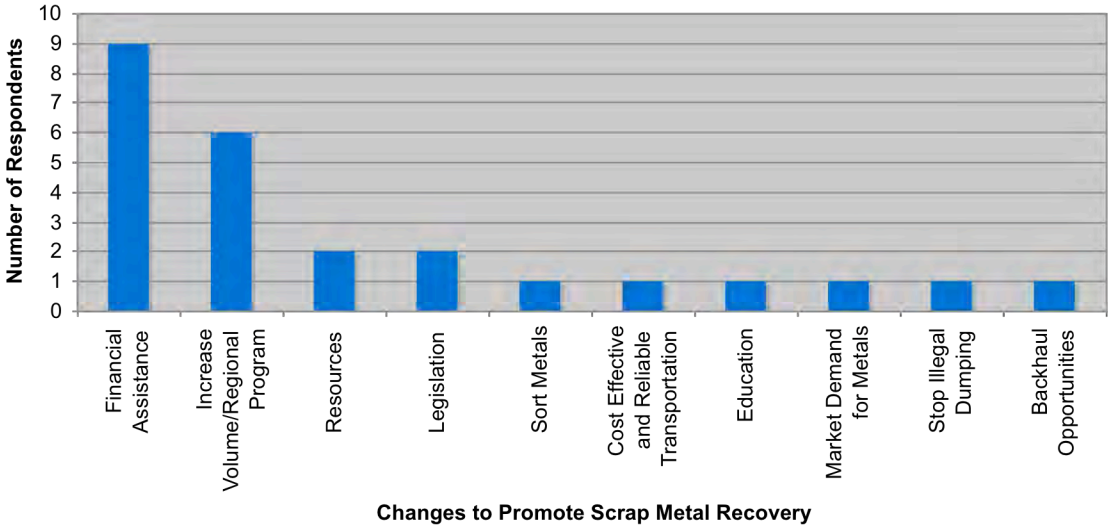

Figure 5: Suggested Changes to Promote Scrap Metal Recycling in the Northwest Territories

Many communities have stockpiled scrap metal for years, if not decades. Norman Wells is one community that is close to maximum landfill capacity and recently acquired funding through the Territorial Government (Industry, Tourism, and Investment Department) to hire a consultant to determine the best option for recycling scrap metal.

6.4 Greenhouse Gas Emission Reductions from Stockpiled Scrap Metal Recovery

According to the report *Determination of the Impact of Waste Management Activities on Greenhouse Gas Emissions: 2005 Update (ICF Consulting, 2005),* recycling 1 tonne of steel results in a net reduction of 1.2 tonnes of eCO_2, while aluminum and copper deliver net reductions of 6.5 and 4.1 tonnes, respectively, and recycling a tonne of white goods produces a net reduction of 1.48 tonnes of eCO_2.

Table 4: Greenhouse Gas Emission Reductions for Various Metal or Metal-Bearing Products

Metal or Metal Bearing Product	GHG Emission Reductions (recycling over landfill disposal)
Aluminum	(6.51) tonnes eCO_2/tonne of Al
Copper	(4.11) tonnes eCO_2/tonne of Cu
Steel	(1.20) tonnes eCO_2/tonne of St
White Goods	(1.48) tonnes eCO_2/tonne of WG

Negative number (inside brackets) represent emission reductions

(ICF Consulting, 2005)

Auto hulks are assumed to have the following composition: 66% ferrous metal, 7% aluminum, and 27% other non-ferrous metals and non-metallic material (Natural Resources Canada, 2006). The blend of ferrous and non-ferrous metal in a stockpile of mixed scrap is difficult to know. For the purposes of developing some GHG emission projections, it is assumed that, at the top end, scrap metal includes 10% non-ferrous metal, while at the bottom end the comparable figure is 1%. These are pure estimates.

The amount of stockpiled metal scrap in Northern Alberta is estimated to be 4,800 tonnes. Applying the scrap metal breakdowns from the previous paragraph, it is estimated that the Alberta stockpile represents a potential reduction in GHG emissions of between 6,000 and 8,000 tonnes of equivalent carbon dioxide (eCO_2).

In the NWT, it is estimated that there are 34,044 tonnes of stockpiled scrap metal. The GHG benefit to be derived by recycling this material is projected to be between 43,000 and 57,000 tonnes of eCO_2.

7 Scrap Metal Recovery in the Northwest Territories Stakeholder Workshop

On May 2, 2007 a Scrap Metal Recovery in the Northwest Territories Stakeholder Workshop took place in Yellowknife, NWT. Twenty-three individuals attended this event representing communities throughout the Northwest Territories, the federal and territorial governments, a processor and transportation providers:

Communities

- Charter Community of K'asho Got'ine (Fort Good Hope)
- Charter Community of Tsiigehtchic
- City of Yellowknife
- Community Government of Behchoko
- Hamlet of Fort McPherson
- Hamlet of Fort Providence
- Hamlet of Tulita
- Settlement of Enterprise
- Settlement Corporation of Fort Resolution
- Town of Fort Smith
- Town of Inuvik
- Town of Norman Wells

Federal Government

- Natural Resources Canada

GNWT Departments

- Environment and Natural Resources
- Transportation, Policy and Planning
- Municipal and Community Affairs

Processor

- Richmond Steel Recycling

Transportation Providers

- Grimshaw Trucking
- RTL Robinson Enterprises Ltd.

7.1 Barriers to Scrap Metal Diversion and Changes to Promote Recovery

Stakeholder consultation took place and additional barriers to survey responses (e.g., cost, volume, transportation logistics/seasonal weather, backhaul opportunities, staging ground, and education) were identified, as follows:

- Lack of political will
- Stockpiles not properly sorted, managed, and processed
  - Not sure what is in stockpiles
- Third party junkyards
- Lack of capacity
  - Landfills not staffed or controlled, no fencing
  - Lack of resources in smaller communities
- Landfills are currently subsidized – places recycling at a disadvantage
- New Government regulations for transportation (e.g. strapping and netting)
- No procurement standards and enforcement
- No industry responsibility, Extended Producer Responsibility
- Environmental regulations do not encourage recycling, and may discourage
- Need to standardize practices for regional opportunities
  - Communities have different rules and tipping fees
  - Need a regional coordinator
- Liability with scavenging

This stakeholder workshop focused on opportunities to minimize barriers and changes to promote scrap metal recovery. A copy of the meeting notes is located in Appendix C.

Changes to increase scrap metal recovery opportunities defined at the workshop center on the need for a territorial program starting at the regional level, facilitation and communications to bring communities together, overall program coordination, public education and potential public/private partnerships.

It is recommended that a scrap metal recovery program will likely take place in two stages; the first is a cleanup of existing stockpiles and the second an ongoing program that includes front end sorting.

8 Transportation

One of the dominant barriers to recycling in the North is the cost of transportation. Northern Alberta has significant travel distances, but an extensive road system allows for travel throughout the year, whereas, the Northwest Territories has several transportation-related factors that affect freight delivery:

1) Extreme distances to scrap metal markets
2) Short time frame to transport freight due to seasonal weather (e.g., winter roads typically open 10 weeks per year)
3) Logistical concerns, for instance, some communities must use barges followed by trucking

Figure 6 outlines the Northwest Territories highway system and seasonal winter roads.

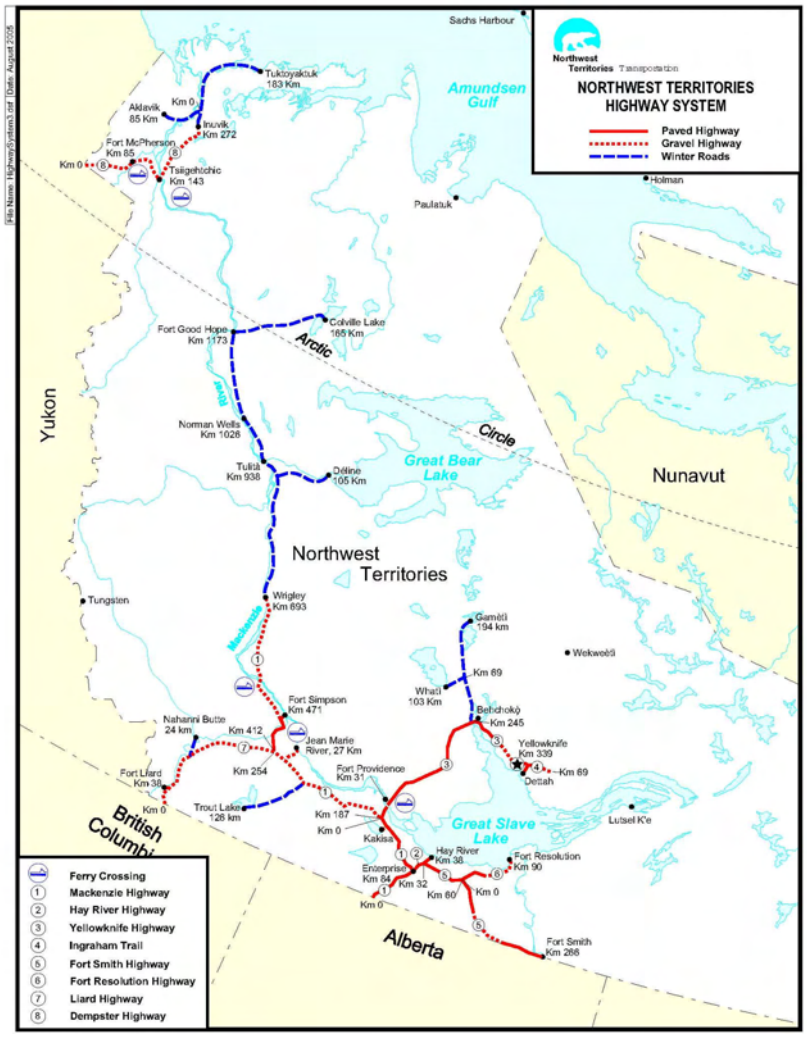

Figure 6: Northwest Territories Highway System

(GNWT Transportation, 2007)

Season opening and closure dates for ferries, ice crossings, and ice/winter roads vary from year to year, depending on the weather. Ferries run from late-May to late-October with the exception of the Fort Providence crossing that generally closes in January. Ice crossings can start as early as mid-November and the last trip is typically late-April, while ice/winter roads start December/January and finish March/April.

In addition to the Government of Northwest Territories winter roads, the private Joint Venture Management Committee (JVMC) Tibbitt to Contwoyto Winter Road opens for approximately 10 weeks, from late-January to early-April, to transport goods to industry north of Yellowknife (Figure 7). In 2007, the JVMC anticipates 10,000 truck loads of fuel, explosives, equipment, and assorted freight transported to the three operating diamond mines, Ekati, Diavik, and Tahera, to the Snap Lake mine construction project, and to various exploration projects and tourist camps (Diavik Diamond Mines Inc, 2007a).

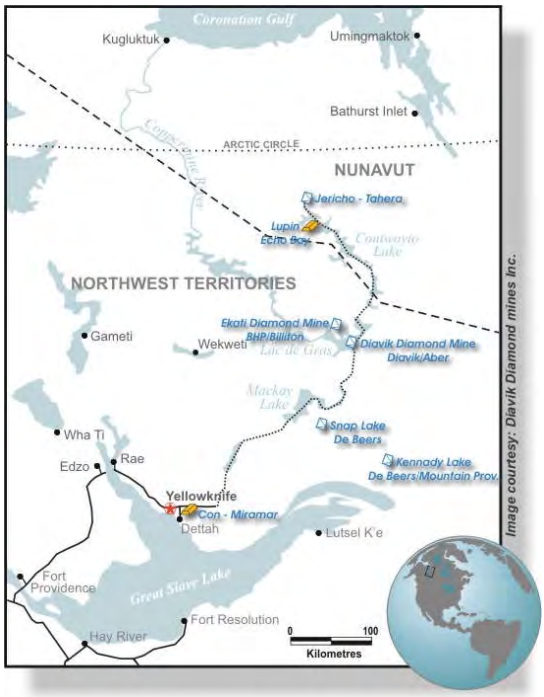

Figure 7: Tibbitt to Contwoyto Winter Road to Snap Lake, Diavik, Ekati, and Jericho-Tahera Diamond Mines

(Diavik Diamond Mines, 2007b)

Due to the heavy weight of scrap metal, air is not considered a viable transportation alternative, while barge, train, and trucking are options to consider. Two barging companies service the Northwest Territories, a railway travels between Edmonton and Hay River, and numerous trucking companies have offices in the Northwest Territories and through out Northern Alberta. These companies include:

Barge

- Cooper Barging
- Northern Transportation Company Limited

Train

- CN

Truck

- ARS Trucking and Welding Ltd.
- ECL
- Grimshaw Trucking L.P.
- Northwest Transport Ltd.
- Rainbow Transport Ltd.
- RTL Robinson Enterprises Ltd.
- Tli Cho Landtran Transport Ltd.

Contact information for these transportation providers can be obtained in Appendix D and sample transportation rate schedules are located in Appendix E.

9 Scrap Metal Processing and Markets

Scrap metal markets are highly competitive and prices fluctuate upon supply and demand, with non-ferrous metal (e.g., aluminum, brass, and copper) worth significantly more than ferrous metal (e.g., steel).

Municipalities typically collect scrap metal at landfill sites then contract a mobile processor to crush and bale, as needed. Sometimes processors haul metal directly to market, while other times municipalities hire a transportation provider to deliver the metal.

A list of private scrap metal collectors and processors in Northern Alberta and the Northwest Territories is located in Appendix F.

Payment varies by metal type and fluctuates with weight and the world metal market. At the time of report writing, current rates based on metal dropped off at processing facilities are summarized in Table 5.

Table 5: April 2007 Rates for Scrap Metal Dropped off at Processors

Metal Type	GenAlta Recycling Inc. (AB)	Richmond Steel Recycling Ltd. (BC)
Aluminum	18¢ - 90¢ /lb	70¢ - 90¢ /lb
Brass	97¢ - $1.50 /lb	$1.50 - $ 2.00 /lb
Copper	$1.12 - $ 2.48 /lb	$2.50 - $ 3.00 /lb
Lead	16¢ /lb	40¢ - 60¢ /lb
Nickel		$20 /lb
Stainless Steel	$1.31 /lb	$1.60 - $2.40 /lb
Steel	$50 /ton, shredder steel (cars, white goods) $150 /ton, heavy melt for steel mill (structural steel, heavy plates and cable)	$135 /net ton $155 /net ton prepared $175 /net ton plate and structural
Tin		$115 /net ton
Titanium		$3.00 - $8.00 /lb
Zinc	25¢ /lb	70¢ - 90¢ /lb

(Kerbs, B., 2007b and Rai, J., 2007)

9.1 Prohibited Items

Due to safety issues, protection for the environment and increasingly stringent laws and regulations in these areas, metal processors do not accept potential hazardous waste materials for processing. In order to prevent this situation from arising, GenAlta Recycling Inc. (2006) prohibits the following materials:

- Asbestos containing scrap
- Ballast containing scrap
- Capacitor containing scrap
- Chemical containing scrap
- Electronic scrap containing printed circuit boards
- Lead containing scrap
- Medical scrap
- Mercury containing scrap
- Radioactive scrap
- Sludge containing scrap
- Tar containing scrap
- Unemptied and unpunctured gas tank containing vehicles
- Unpunctured/uncut gas bottles/cylinders/tanks

- Any scrap that contains disproportionate amounts of dirt/soil, rocks, woods, rubber, tires, general garbage, unattached plastic, paper and glass products, and other non-metallic materials

Also see Figure 8 that illustrates another scrap metal processor's concerns about the kind of material coming to their door.

Figure 8: Sign of Prohibited Materials at Richmond Steel Recycling Ltd. Facility

(Richmond Steel Recycling Ltd., 2007)

9.2 Education

Customer education is extremely important for efficient scrap metal processing. Suggestions from Porta Crush, an Alberta scrap metal mobile processor, include (Porta Crush, 2007a):

1) Sort and separate white goods from other metal that cannot be shredded (e.g., pipe, grader blades, solid metal shafts, wire, and cable); this allows white goods to be more efficiently processed (see Appendix G).
2) Active site supervision to ensure hazardous waste (e.g., mercury switches, ballasts, and capacitors) removal from white goods and decrease site contaminants such as syringes, carcasses, propane bottles, and rotten food.
3) Ensure that landfill equipment does not push mud and gravel into the white goods pile, as this causes contamination issues, potentially resulting in material rejection.
4) Where feasible, place scrap metal on paved rectangular sites and allow only rubber-tired equipment on the pavement; this generates better quality scrap metal.

It is also noted that the cost of scrap metal processing and transportation in Alberta has increased over the past five years. Insurance and fuel has doubled since September 2001, wages have increased significantly due to labour shortages, new load securement laws have increased the cost of transportation (e.g., loads must now be wrapped with Department of Transportation approved cargo netting which is expensive), and the volatile scrap metal market make yearly contracts difficult to estimate and budget.

10 Funding Opportunities

Funding opportunities assist greatly with planning and feasibility studies, and the construction of new infrastructure. Detailed information on five funding programs for potential municipal scrap metal recovery initiatives are located in Appendix H, and include the following:

- Municipal Rural Infrastructure Fund (Alberta and Northwest Territories)
- Green Municipal Fund (Alberta and Northwest Territories)
- New Deal for Cities and Communities (Alberta and Northwest Territories)
- Alberta Municipal Infrastructure Program (Alberta)
- New Deal for NWT Community Governments (Northwest Territories)
- EcoAction (Environment Canada)

Some funding opportunities involve submitting proposals, while others are based on the federal and provincial government distributing funds directly to municipalities. Additionally, three of these programs have funding set aside for green/environmentally sustainable studies and infrastructure.

11 Recommendations for Scrap Metal Recovery in the Northwest Territories

Based on the research conducted for this project, as well as feedback received through the survey and workshop, the following recommendations are being presented to further scrap metal recycling in the Northwest Territories:

<u>Communication/Education</u>

1) Encourage communities to allocate funding in their annual budgets for scrap metal recycling.
2) Standardize scrap metal recovery practices to provide increased regional opportunities.
3) Develop an education program for the public and politicians that centers on repairing, reuse, and sorting scrap metal.

Governance

1) Provide government leadership through procurement practices that encourage product stewardship and enhanced scrap metal recycling.
2) Foster partnerships between industry, government, and local communities.
3) Consider opportunities for incentive-based approaches to encourage increased scrap metal recycling, including the following:
    - Expansion of the Waste Recovery and Recycling Act to include white goods as a deposit program
    - Regional landfill bans
    - Differential tipping fees to encourage source separation/ recycling

Planning

1) Establish a NWT scrap metal recycling plan, based on a regional approach with two primary transportation hubs (Hay River and Tuktoyaktuk), and additional transportation nodes (e.g., Fort Simpson or Fort Providence, Norman Wells, and Inuvik) to facilitate participation from smaller communities (see Figure 9).
2) Establish program based on three regions: Inuvik area (Fort McPherson, Tsiigehtchic, Inuvik, Tuktoyaktuk), Sahtu area (Fort Good Hope, Norman Wells, Tulita, Wrigley), and North Slave Lake area (Yellowknife, Behchoko, Fort Simpson, Fort Liard, Fort Providence, Hay River, Enterprise, Fort Resolution, Fort Smith).
3) Provide overall program facilitation through the Territorial Government (Municipal and Community Affairs), with dedicated coordinators from each region.
4) Develop the scrap metal plan in two stages:
    - Cleanup of existing stockpiles
    - Implementation of ongoing program including front-end sorting, processing, and transportation
5) Consider potential to phase in territorial program over time, starting with larger communities and adding smaller and more remote locations.
6) Establish a resource recovery fund to assist with program costs (and consider how these funds would be accrued – ties in with governance incentive-based approaches).
7) Pursue backhauling opportunities with transportation providers (e.g., backhauls from diamond mines north of Yellowknife).

Figure 9: Potential Transportation/Collection Network

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Appendix A: Scrap Metal Recycling Program – City of Yellowknife, NWT

Yellowknife, capital city of the Northwest Territories, with a population of just under 20,000 is located on the north shore of Great Slave Lake. Of all Northwest Territories municipalities, Yellowknife has the most progressive scrap metal recovery program.

The landfill, located at the Yellowknife Solid Waste Facility, started recovering white goods in 1997, expanded to auto hulks in 2003 and then to light steel in 2005.

Scrap metal is currently sorted into three piles, auto hulks, white goods, and ferrous/non-ferrous metal, at the landfill with an estimated 3,618 tonnes diverted to southern recyclers between 2000 and 2006.

Domestic vehicles, scrap steel and white goods are accepted at the City of Yellowknife Landfill for the following tipping fees:

Domestic Vehicles: $100 each
Scrap Metal: $35/tonne
White Goods (fridges, freezers): $35 each
White Goods (other): $10 each

Scrap metal is currently sorted into three piles, auto hulks, white goods, and ferrous/non-ferrous metal, at the landfill.

There are no metal processors in Yellowknife so scrap metal is processed by out-of-territory contractors that transport metal to southern markets.

Auto Hulks

On an as needed basis, the City of Yellowknife releases tenders to metal processors for auto hulk recycling.

In 2003, Macoor Holdings from Lac La Biche, AB removed the hazardous waste components (e.g., mercury switches and batteries), crushed and transported 900 auto hulks to recycling markets while Richmond Steel Recycling from Richmond, BC, in 2005, processed and transported 550 auto hulks (Figure A-1 and Figure A-2).

Figure A-1: Richmond Steel Recycling's Car Crusher

Figure A-2: Crushed Auto Hulks

Ferrous Metal

As part of the 2005 auto hulk crushing arrangement, Richmond Steel Recycling also conducted a pilot project with a new light metal crusher (Figure A-3). Light steel materials (e.g., siding) from the large steel pile at the Yellowknife Landfill (Figure A-4) were processed into 770 bales and transported to the Richmond Steel Recycling facility in 18 tractor trailers.

Figure A-3: Richmond Steel Recycling's Light Metal Crusher

Figure A-4: Ferrous Scrap Metal Pile

Additionally, a contractor from New Brunswick transports goods to the diamond mines north of Yellowknife once a year. On the way south this contractor stops at the Yellowknife Landfill to collect a load of heavy steel that is transported to Edmonton before the return trip to New Brunswick. In exchange for no transportation fees, the contractor retains all profits from selling the steel to scrap metal recyclers.

Non-Ferrous Metal

The City of Yellowknife allows public scavenging at the Yellowknife Landfill in designated areas, it also provides C & C Recycling with a permit to collect non-ferrous metal from the remaining landfill areas. This is why there is minimal non-ferrous metal stockpiled.

White Goods

In 1997 the City of Yellowknife started to bale white goods (Figure A-5 to Figure A-7). City staff remove hazardous waste materials (e.g., capacitors, ballasts, mercury switches) from appliances and bale white goods throughout the year. These bales are stockpiled until enough are accumulated to transport the white goods to recycling markets. White good bale transportation tenders are renewed every three years; Manitoulin Transport (formerly Northwest Transport) holds the 2006-2008 contract, while RTL Robinson Enterprises Ltd. held the 2002-2005 contract.

Figure A-5: Stockpiled White Goods

Figure A-6: City of Yellowknife Baler

Figure A-7: Baled White Goods

Scrap Metal Diversion History

It is estimated that 3,618 tonnes of scrap metal was diverted to southern recyclers between 2000 and 2006. Table A-1 describes the number and tonnage of auto hulks, white goods, and light steel metal processed and transported to metal recyclers from the Yellowknife Landfill by year.

Table A-1: Yellowknife Landfill – Number and Tonnes of Auto Hulks, White Goods, and Light Metal Recycled

Year	Auto Hulks		White Goods[2]		Light Steel from Ferrous Metal Pile	
	Number of Auto Hulks	Tonnes[1]	Number of Bales	Tonnes[3]	Number of Bales	Tonnes[4]
2000	0	0	84	84		
2001	0	0	126	126		
2002	0	0	127	127		
2003	900	1,350	144	144		
2004	0	0	0	0		
2005	550	825	348	348	770	477
2006	0	0	137	138		
Total	1,450	2,175	966	966	770	477

[1]One average auto hulk is estimated to be 1.5 tonnes (Kerbs, 2007a)
[2]Data collection started in 2000
[3]One bale of white goods is estimated to be 1 tonne (Underhay, 2007)
[4]Personal communication (Underhay, 2007)

(Underhay, 2007)

Due to mechanical difficulties, no white goods were processed in 2004 which accounts for a significant increase of baled white goods in 2005.

As of March 31, 2007, the City of Yellowknife has baled 37 tonnes of white goods and has released a tender for 750 tonnes of auto hulks to be processed and transported to recyclers (Underhay, 2007).

Local Private Scrap Metal Businesses

Age Automotive is the only auto wrecker in Yellowknife, accepts specific vehicles.
Contact: Garth Eggengberger, T: (867) 873-5528

C & C Recycling has a permit to collect non-ferrous metal from the Yellowknife Landfill and collects metal from local businesses.
Contact: Lloyd Lush, T: (867) 669-1242

Appendix B: Scrap Metal Recovery in Northern Alberta and the Northwest Territories Survey

Recycling Council of Alberta

Natural Resources Canada
Scrap Metal Recovery for Remote Communities

Northern Alberta and NWT Metals Survey

Municipality/Municipal District/County: _____

Name: _____

Position: _____

Address: _____

_____

Phone Number: _____

Fax Number: _____

Email: _____

Website: _____

Can your contact information be added to the NRCAN report? ☐ Yes ☐ No

_____

1) Are metals collected at any of your facilities?

☐ Yes ☐ No

What is the nature of the facilities that collect metal?

_____

_____

If yes, check all applicable materials.

Automotive Hulks		Ferrous metals		Non-ferrous metals	
White Goods		Other			

2) Are metal stockpiles located at your facilities right now?

☐ Yes ☐ No

If no, describe how scrap metal is handled or processed.
Proceed to question 8.

_____

_____

_____

If yes, which facilities? _____

If yes, indicate the metal composition.

Automotive Hulks		Ferrous metals		Non-ferrous metals	
White Goods		Other			

3) Are stockpiled metals sorted?

☐ Yes ☐ No

4) What is the approximate quantity of the stockpiled metals?

Material	Weight (T) or Dimensions

5) Is your Municipality/Municipal District/County interested in recycling these metals?

☐ Yes ☐ No

If no, explain why _____

_____

_____

_____

6) Are there any plans to process or ship these metals for recycling?

☐ Yes ☐ No

If yes, describe the plans _____

_____

_____

_____

_____

If no, describe any challenges or barriers to recovering and recycling scrap metals.

_____

_____

_____

_____

7) What changes would enable your Municipality/Municipal District/County to recover and recycle more metals?

_____

_____

_____

8) Are you aware of other metal stockpiles, either public or private, in the region?

☐ Yes ☐ No

If yes, provide details or contact information _____

9) Materials are typically transported from your Municipality by:

Additional information:

Appendix C: Scrap Metal Recovery in the Northwest Territories Stakeholder Workshop Notes

Yellowknife City Hall, Yellowknife
May 2, 2007, 10:00 a.m. – 3:00 p.m.

Stakeholder Attendees:

Urban Antoine	Hamlet of Tulita
Rhonda Batchelor	GNWT – Transportation, Policy and Planning
Thomas Beard	GNWT – Municipal and Community Affairs
Phillip Blake	Charter Community of Tsiigehtchic
Blair Duncan	Richmond Steel Recycling
Ernie Firth	Hamlet of Fort McPherson
Ken Hall	GNWT – Environment and Natural Resources
Alan Kimble	Settlement of Enterprise
Greg Laboucan	Charter Community of K'asho Got'ine (Fort Good Hope)
Albert Lafferty	Hamlet of Fort Providence
Bruce LeBlanc	Community Government of Behchoko
Olivia Lee	GNWT – Municipal and Community Affairs
Derek Lindsay	Town of Inuvik
Dave MacNevin	RTL Robinson Enterprises Ltd.
Mary McCreadie	Lutra Associates for GNWT – Environment and Natural Resources
John Rai	Richmond Steel Recycling
Jim Saunders	Grimshaw Trucking LP
Patrick Simon	Settlement Corporation of Fort Resolution
Robert Tanche	Hamlet of Fort Providence
Bruce Underhay	City of Yellowknife
Don Webb	Town of Fort Smith
Doug Whiteman	Town of Norman Wells

Organizer Attendees:

Karen Scoulding	Recycling Council of Alberta
Christina Seidel	Recycling Council of Alberta
Robert Sinclair	Natural Resources Canada

Christina Seidel from the Recycling Council of Alberta facilitated the workshop.

Mayor Gordon Van Tighem welcomed everyone to Yellowknife and to the workshop.

1.0 Project Background and Scrap Metal Recovery in Northern Manitoba/Nunavut

Recovering Scrap Metal from Northern Communities was presented by Robert Sinclair of Natural Resources Canada.

2.0 NWT Scrap Metal Recovery Survey Results

Scrap Metal Recovery in the Northwest Territories was presented by Christina Seidel of the Recycling Council of Alberta.

3.0 Identification of Barriers to Scrap Metal Recovery

Additional barriers to the ones identified in the survey results (e.g., cost, volume, transportation logistics/seasonal weather, backhaul opportunities, staging ground and education) include:

- Political will
- Stockpiles not properly sorted, managed and processed
    - Not sure what is in stockpiles
- Third party junkyards
- Lack of capacity
    - Landfills not staffed or controlled, no fencing
    - Lack of resources in smaller communities
- Landfills are currently subsidized
- New Government regulations for transportation (e.g., strapping and netting)
- No procurement standards and enforcement
    - Industry responsibility, EPR, ownership
- Environmental regulations, what about the producer
- Need to standardize practices for regional opportunities
    - Communities have different rules and tipping fees
    - Need a coordinator
- Liability with scavenging

<u>Feedback Form:</u>

- Stockpiles not sorted, managed, processed properly
- Lack of capacity (manpower) for smaller communities
- New safety transportation regulation in the last 2 years (e.g., tie down, netting) (x2)
- Lack of environmental standards to force local government to recycle scrap metals (x2)
- Knowledge, education, ownership, new regulations, capacity, increasing fees, and backhauls with trucking and barging

4.0 Opportunities to Minimize Barriers

4.1 Cost

- Local governments need to incorporate scrap metal recovery financing into the budget
- If you know how much scrap metal is available and talk to a transportation provider ahead of time the price goes down in larger centers
- Territorial Government to invest in system (e.g., incentives)

Feedback Form:
- Proper metal stockpiles would decrease cost
- Very high, considering what you get for scrap metal. Need volume to make it worthwhile.
- Community direction on establishing staging grounds other than current landfill sites as these are temporary

4.2 Volume

- Smaller communities need to have a regional program in order to increase volume and entice processors

Feedback Form:
- Management, current versus ongoing
- Dependant on metal prices; higher volumes needed when prices are lower
- Establish regional drop off centers to facilitate highest possible volumes for transportation
- Have all communities (in area) work together with one company, either trucking or barge, to increase volume to keep costs down

4.3 Lack of Staging Ground

- Limited space in smaller communities
- Build a hub, build a node and then branch out; must adapt for each node
- Consider Hay River and Tuktoyaktuk for hubs and Fort Simpson, Norman Wells and Inuvik for nodes
- Municipal and Community Affairs (MACA) could help with land and develop a staging area

Feedback Form:
- Strategic sites (e.g., Inuvik, Norman Wells, Hay River)
- Could be either Inuvik or Tsiigehtchic. Inuvik for communities further north (e.g., Aklavik, Tuktoyaktuk, Inuvik) and Tsiigehtchic for Fort McPherson and Tsiigehtchic
- Detailed directions on implementation of staging grounds, how to best fit the community and the resulting transportation method (e.g., truck or barge)

4.4 Lack of Sorting / Collection Management

- Scrap metal must be sorted at the front end; too expensive to do at the back end

- Must cleanup/remove scrap metal stockpiles as they stand now and then move forward with new sorting rules; consider a 5 year plan
- Signage at collection site that explains sorting by photos, not words
- Limited operation/management funding is available from MACA; need to sell stockpile cleanup as a community capital expense
- Need a sorting management system

4.5 Lack of Capacity / Resources

4.6 Transportation Logistics / Seasonal Weather

- Scrap metal processed in the summer at nodes and transported in the winter
- Historical issues
- Smaller communities may have local opportunities (e.g., meet with private transportation contractor once they have off loaded goods and mention that the community has some materials to go south)
- Communities can unite and go with one business that does everything or can allow bids from several businesses (e.g., transportation – ARS, Tli Cho Landtran, RTL)

Feedback Form:
- Crush cars in summer, backhaul in winter; has worked in past
- Transport the metal out during summer with barging company (e.g., NTCL, Cooper's), or with trucks during winter on empty backhauls of possible
- Inuvik has twice a year when road travel is closed due to river crossings being closed, summer only time for barging

4.7 Backhaul Timing/Coordination

- Communication and planning with transportation provider is essential
- Significant backhaul barge opportunities with Northern Transportation Company Limited (NTCL); 1198 containers go south empty out of 1200 that go north full.
- Consider trip north being the backhaul
- Utilize winter backhauls

Feedback Form:
- Possibly with barge (e.g., NTCL) of room available, or with local trucking firms or southern firms with empty backhaul
- Backhauls may be available however regulations regarding haulers needs to be addressed in the north as mentioned at the workshop

4.8 Education

- Need to educate the public and politicians; public drives politicians
- Highlight cost savings (tipping fee comparisons) and benefits to environment and health
- Start education at the school level; children teach parents
- Standardized visual photo signage at collection site
- Territorial Government may have a role
- Best practices (include operational budget); workbook; guidelines for separation

- Public education needed in small communities

Feedback Form:
- Try to educate the public on what could be recycled (saved), or reused, or even recovered to increase volume of metal
- Recycling has always been an education process, this is basically new for the North, we would rely on outside help for guidance

4.9 Political Will

- Being 'green' is a hot topic these days
- Public buy-in will direct political will
- British Columbia Government invested in metal recycling infrastructure that has evolved into Richmond Steel Recycling

4.10 Stricter Regulations (e.g., transportation, environmental)

- Consultation on expanding the NWT Waste Reduction and Recovery Act starts in the Fall of 2007
- Landfills not following regulations
- Need to certify landfill operators
- Consistent enforcement and training is required

4.11 Overall Coordination/Standardize Practices

- Central coordination is needed
- Communities must meet to communicate and coordinate on a regular basis
- Need a champion in every community
- Coordinator options include:
  - Communities
  - MACA (assist, coordinate, facilitate communities that do not have resources); long history of working with communities
  - Northwest Territories Association of Communities (NWTAC)
- Standardizing practices will make it easier for a regional program

4.12 Lack of Industry Responsibility

- Historical lack of industry responsibility
- Link between industry responsibility and government will
- Government regulates industry or cleans up after them
- Public education leads to government action and industry responsibility
- Treat like a fishing trip, "leave no trace", how to enforce?
- Procurement includes clean-up
- Deposit program for white goods; landfill invoices manufacturer
- Expand beverage deposit system to include white goods
- Industry practices need to "walk the talk"; requires regulations

4.13 Others

Feedback Form:
- Alternative uses of scrap metals in the communities may pose a problem when weighing the costs of recycling scrap metals versus using auto hulks as a system for building cells in the landfill, they make ideal dikes in the permafrost
- Again, educating other companies on how to treat in coming metal waste to get best value for it (e.g., removing and recovering mercury switches from auto hulks before sending south)

5.0 Additional Changes to Promote Scrap Metal Recycling

- Facilitator to bring communities together
- Cost/volume – private sector partnerships
- Regional infrastructure
- Communities need to be united
- Stage 1, clean up existing stockpiles
- Stage 2, ongoing program that includes sorting at the front end
- Hay River and Tuktoyaktuk could be hubs, determine nodes
- Need territorial wide program (e.g., anti smoking and beverage containers)
- Overall coordination (e.g., market program and build public perception)
- Implement program in phases

Feedback Form:
- Regular education workshops at the school level and up
- Signs with pictures at landfill entrances
- Can't stress education public enough on how to recycle, recover, repair, reuse, where possible to keep landfills more manageable, and keeping costs down as much as possible
- Express the importance of recycling scrap metal rather than burying it which has been the norm for decades in the North. It has been and still is cost prohibitive to recycle in the Arctic. Federal Government involvement would be a definite plus. This need to be a funded initiative as this would be a hard sell to residents especially in a tax-based community.

6.0 Next Steps

Derek Lindsay (Town of Inuvik) to discuss with NWTAC if scrap metal recovery can be added to the Annual General Meeting agenda in Norman Wells (May 14-17, 2007). Yellowknife's mayor, Gordon Van Tighem, is the President of NWTAC.

Coordinators for regional discussions include:
- Inuvik Region - Derek Lindsay (Town of Inuvik)
- North Slave Region - Bruce Underhay (City of Yellowknife)
- Sahtu Region - Greg Laboucan (Charter Community of K'asho Got'ine – Fort Good Hope)

Norman Wells has hired a consultant to review scrap metal composition.

Olivia Lee (MACA) to assist with communications and coordination.

Dave MacNevin (RTL Robinson Enterprises Ltd.) to summarize historical information on transportation and approach NTCL.

Fax workshop feedback forms to the Recycling Council of Alberta at (403) 843-4156.

Recycling Council of Alberta to provide all workshop attendees with a copy of the final report.

Adjournment: 3:00 p.m.

Appendix D: Transportation Provider Contact Information

Transportation Mode/Business	Address	Phone/Fax/ Contact	Website/E-mail
Barge			
Cooper Barging	P.O. Box 496 Fort Simpson, NT X0E 0N0	T: (800) 663-5220 T: (867) 695-3720 F: (867) 695-3715 Michael Cooper	www.cooperservices.ca michaelc@cooperservoces.ca
Northern Transportation Company Limited	42003 Mackenzie Highway Hay River, NT X0E 0R9	T: (877)-770-6825 T: (867) 874-5100 F: (867) 874-5103	www.ntcl.com ntcl@ntcl.com
Train			
CN		T: (888) 668-4626 T: (866) 926-7245	www.cn.ca
Truck			
ARS Trucking and Welding Ltd.	10601 2 Street N.W. Edmonton, AB T6S 1C9 Yellowknife, NT	T: (780) 464-9612 F: (780) 464-2923 T: (867) 920-4262	
ECL	10502, 17 Street Edmonton, AB T6P 1P4	T: (780) 461-8103 F: (780) 463-1133	www.eclgroup.com
Grimshaw Trucking L.P.	11510, 151 Street Edmonton, AB T5M 3N6 125 MacDonald Cres. Fort McMurray, AB T9H 4B3 11002, 92 Avenue Grande Prairie, AB T8V 6B5 Box 415 High Level, AB T0H 1Z0 9610, 90 Avenue Peace River, AB T8S 1G8 Fort Smith, NT 43043 Mackenzie Hay River, NT X0E 0R9 142 Enterprise Road Yellowknife, NT X1A 2N2	T: (888) 414-2850 T: (780) 414-2880 F: (780) 455-7818 T: (780) 743-3351 F: (780) 743-2964 Jennifer McGeough T: (780) 532-0139 F: (780) 538-2944 Shirley Norton T: (780) 926-3615 F: (780) 926-2120 Nettie Bueckert T: (780) 624-2786 F: (780) 624-4920 Maurice Troup T: (867) 872-0777 F: (867) 874-3820 Blaine Walterhouse T: (867) 874-2380 F: (867) 874-3820 Bob Vossler T: (867) 873-4548 F: (867) 873-3470 Jim Saunders	www.grimshaw-trucking.com

Transportation Mode/Business	Address	Phone/Fax/ Contact	Website/E-mail
Northwest Transport Ltd. (Manitoulin)	15811, 112 Avenue Edmonton, AB T5M 2V9 Box 347 Fort Simpson, NT X0E 0N0 15 Industrial Drive Hay River, NT X0E 0R6 Box 2630 Inuvik, NT X0E 0T0 7 Old Airport Road Yellowknife, NT X1A 3T2	T: (800) 661-6992 T: (780) 452-7360 F: (780) 454-3041 T: (867) 695-2319 F: (867) 695-2818 T: (867) 874-3636 F: (867) 874-3339 T: (867) 777-2519 F: (867) 777-2666 T: (800) 661-0742 T: (867) 873-3591 F: (867) 873-2247	www.nwtl.com sales@manitoulintransport.com
Rainbow Transport Ltd.	17508, 116 Avenue Edmonton, AB T5S 2T9 8501 – 115 Street Grande Prairie, AB T8V 6Y6 10605, 94 Street High Level, AB T0H 1Z0 9700, 74 Street Peace River, AB T8S 1T3 Box 809 Manning, AB T0H 2M0 5 Rainbow Drive Rainbow Lake, AB T0H 2Y0	T: (780) 452-5275 F: (780) 452-3386 Ryan Bubenko T: (780) 538-1441 F: (780) 532-9443 Brad Matkowski T: (780) 926-3821 F: (780) 926-4938 Bruce Goddard T: (780) 624-1377 F: (780) 624-3474 Gary Minard T: (780) 836-3131 F: (780) 836-3178 Tony Green T: (780) 956-3925 F: (780) 956-3688 Rhonda Drover	www.rainbowtransport.com
RTL Robinson Enterprises Ltd.	10821 – 209 Street Edmonton, AB T5S 1Z7 800 Whiskey Jack Drive Enterprise, NT X0C 0R1 P.O. Box 1807 350 Old Airport Road Yellowknife, NT X1A 2P4	T: (780) 447-3300 F: (780) 447-4085 T: (867) 984-3551 F: (867) 984-3271 T: (867) 873-6271 F: (867) 920-2661 Dave MacNevin	www.rtl.ca admin@rtl.ca
Tli Cho Landtran Transport Ltd.	13120 Yellowhead Trail N.W. Edmonton, AB T5L 3C1 P.O. Box 577 358 Old Airport Road Yellowknife, NT X1A 2N4	T: (780) 452-9414 F: (780) 447-2292 Lawrence Cantera T: (867) 873-4044 F: (867) 873-2780 Shawn Talbot	www.tlicholandtran.com Lawrence.Cantera@continentalcartage.com Shawn.Talbot@continentalcartage.com

Appendix E: Transportation Rates

Cooper Barging Service Ltd.
2006 Rate Schedule

Anticipates 2-3% increase for 2007 rates

Rates are base rates applicable between points and are expressed in cents per CWT (100 lbs)

FROM:	FORT SIMPSON	AKLAVIK	FORT MCPERSON	FORT PROVIDENCE	HAY RIVER	INUVIK	KASHO GOTTINE	NORMAN WELLS	TSHGEHTCHIC	TUKTOYAKTUK	TULITA	WRIGLEY	YELLOWKNIFE
TO:													
FORT SIMPSON		1136	1136	570	756	1023	747	632	974	1152	632	537	7 73
AKLAVIK	1136		476	1248	1303	476	724	1053	476	724	1053	1126	1433
FORT MCPERSON	1136	476		1209	1303	476	724	1053	476	742	1053	1126	1433
FORT PROVIDENCE	570	1248	1209		502	1266	1016	915	1152	1367	890	712	615
HAY RIVER	756	1303	1303	502		1173	1135	958	1303	1417	958	889	578
INUVIK	1023	476	476	1266	1173		724	998	476	626	998	1020	1433
KASHO GOTTINE	747	724	724	1016	1135	724		401	724	1169	406	724	1247
NORMAN WELLS	632	1053	1053	915	958	998	401		883	1062	334	565	1053
TSHGEHTCHIC	974	476	476	1152	1303	476	724	883		742	935	1249	1433
TUKTOYAKTUK	1152	724	742	1367	1417	626	1169	1062	742		1062	1338	1559
TULITA	632	1053	1053	890	958	998	406	334	935	1062		526	1053
WRIGLEY	537	1126	1126	712	889	1020	724	565	1249	1338	526		958
YELLOWKNIFE	773	1433	1433	615	578	1433	1247	1053	1433	1559	1053	958	

Minimum charges for a single shipment between any two points, ports or places on Cooper Barging Service Ltd's scheduled routes is $50.00

NORTHERN TRANSPORTATION COMPANY LIMITED
2007 MACKENZIE-WESTERN ARCTIC GENERAL CARGO RATES
Rates per pound
All rates are subject to G.S.T.
(Goods not specific to classification or minimum weights)
FUEL SURCHARGE IS AN ADDITIONAL 3% ON TOP OF LISTED RATE

From Inuvik to	Furniture Appliances Personal Effects	Light Duty Vehicles/Boats on Trailers Subject to Min. Weights. S/Bnd canoes 65.00 per canoe minimum	General Merchandise Single Lot shipments of less than 40,000 lbs. Subject to Minimum Weights. Over 40,000 lbs n/bnd-10%	Light Weight Items, Cubic Foot Items	Oversized Items, Square Foot Items	Minimum Charge includes GST
Hay River	0.1296	0.1296	0.1296			70.00
Tulita	0.1098	0.1098	0.1098			70.00
Lutsel K'e	0.2359	0.2359	0.2359			70.00
Kasho Got'ine	0.0837	0.0837	0.0837			70.00
Norman Wells	0.1098	0.1098	0.1098			70.00
Aklavik	0.1053	0.0790	0.0526	0.7894	7.1076	70.00
					.	
Tuktoyaktuk	0.1384	0.1037	0.0691	1.0367	9.3347	70.00
Bathurst Inlet	0.4248	0.3185	0.2124	3.1855	28.6832	70.00
Cambridge Bay	0.4248	0.3185	0.2124	3.1855	28.6832	70.00
Gjoa Haven	0.4948	0.3711	0.2474	3.7100	33.4060	70.00
Holman	0.3455	0.2591	0.1729	2.5908	23.3289	70.00
Kugluktuk	0.3951	0.2964	0.1975	2.9609	26.6616	70.00
Paulatuk	0.3192	0.2394	0.1595	2.3925	21.5441	70.00
Sachs Harbour	0.3030	0.2273	0.1514	2.2698	20.4385	70.00
Taloyoak	0.5248	0.3936	0.2625	3.9345	35.4276	70.00
Umingmaktok	0.4248	0.3185	0.2124	3.1855	28.6832	70.00

ALL COLLECT SHIPMENTS ARE CHARGED A COLLECTION FEE OF $5.00 PER SHIPMENT
ALL RATES ARE BASED ON UNITIZED CARGO, SUITABLE FOR FORKLIFT HANDLING

NORTHERN TRANSPORTATION COMPANY LIMITED
2007 MACKENZIE-WESTERN ARCTIC GENERAL CARGO RATES
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From Norman Wells to	Furniture Appliances Personal Effects	Light Duty Vehicles/Boats on Trailers Subject to Min. Weights. S/Bnd canoes 65.00 per canoe minimum	General Merchandise Single Lot shipments of less than 40,000 lbs. Subject to Minimum Weights. Over 40,000 lbs.-10%	Light Weight Items, Cubic Foot Items	Oversized Items, Square Foot Items	Minimum Charge includes GST
Hay River	0.0952	0.0952	0.0952			70.00
Tulita	0.0370	0.0370	0.0370			70.00
Lutsel K'e	0.1761	0.1761	0.1761			70.00
Aklavik	0.2439	0.1829	0.1218	1.8277	16.4581	70.00
Kasho Got'ine	0.0889	0.0666	0.0444	0.6649	5.9862	70.00
Inuvik/Tsii	0.2439	0.1829	0.1219	1.8277	16.4581	70.00
Tuktoyaktuk	0.2584	0.1940	0.1294	1.9382	17.4532	70.00
Bathurst Inlet	0.5555	0.4165	0.2779	4.1659	37.5127	70.00
Cambridge Bay	0.5555	0.4165	0.2779	4.1659	37.5127	70.00
Gjoa Haven	0.6249	0.4687	0.3124	4.6834	42.1720	70.00
Holman	0.4263	0.3200	0.2132	3.1978	28.7938	70.00
Kugluktuk	0.5254	0.3942	0.2628	3.9397	35.4749	70.00
Paulatuk	0.3936	0.2951	0.1873	2.8081	25.2866	70.00
Sachs Harbour	0.3703	0.2779	0.1763	2.6429	23.7974	70.00
Taloyoak	0.6578	0.4934	0.3131	4.6959	42.2849	70.00
Umingmaktok	0.5555	0.4165	0.2646	3.9675	35.7264	70.00

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NORTHERN TRANSPORTATION COMPANY LIMITED
2007 MACKENZIE-WESTERN ARCTIC GENERAL CARGO RATES
Rates per pound
All rates are subject to G.S.T.
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FUEL SURCHARGE IS AN ADDITIONAL 3% ON TOP OF LISTED RATE

From Tulita to	Furniture Appliances Personal Effects	Light Duty Vehicles/Boats on Trailers Subject to Min. Weights. S/Bnd canoes 65.00 per canoe minimum	General Merchandise Single Lot shipments of less than 40,000 lbs. Subject to Minimum Weights. Over 40,000 lbs.-10%	Light Weight Items, Cubic Foot Items	Oversized Items, Square Foot Items	Minimum Charge includes GST
Hay River	0.0952	0.0952	0.0952			70.00
Lutsel K'e	0.1761	0.1761	0.1761			70.00
Kasho Got'ine	0.0886	0.0666	0.0444	0.6649	5.9862	70.00
Norman Wells	0.0812	0.0610	0.0405	0.5543	4.9911	70.00
Aklavik	0.2439	0.1829	0.1219	1.8277	16.4581	70.00
Inuvik/Tsii	0.2439	0.1829	0.1219	1.8277	16.4581	70.00
Tuktoyaktuk	0.2749	0.2063	0.1376	2.0629	18.5746	70.00
Paulatuk	0.3933	0.2950	0.1967	2.9486	26.5510	70.00

ALL COLLECT SHIPMENTS ARE CHARGED A COLLECTION FEE OF $5.00 PER SHIPMENT
ALL RATES ARE BASED ON UNITIZED CARGO, SUITABLE FOR FORKLIFT HANDLING

Note: Minimum Weights
1. Trailers, modules, mobile buildings, set-up storage tanks exceeding 5,000 litres and similar bulky items subject to sq. foot price.
2. Lightweight items such as insulating materials, small fibreglass storage tanks not exceeding 5,000 litres. Set-up culverts and prefabricated items (such as trusses, wall panels and set-up cabinets) subject to cubic foot price.
3. Light Duty Vehicles subject to minimum weights: under 15' 3,000 lbs., 15'-18' 4,000 lbs.,18'-20' 5,000 lbs., over 20' + 500 lbs. Per foot.

Note: Unitizing/Palletizing charges extra as per categories listed below. Charges based on gross weight or measurement weight, whichever is greater.
1. Strapping : 1.50 per 100 lbs.
2. Strapping and Palletizing : 5.00 per 100 lbs.

NORTHERN TRANSPORTATION COMPANY LIMITED
2007 MACKENZIE-WESTERN ARCTIC GENERAL CARGO RATES
Rates per pound
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(Goods not specific to classification or minimum weights)

FUEL SURCHARGE IS AN ADDITIONAL 3% ON TOP OF LISTED RATE

From Tuktoyaktuk to	Furniture Appliances Personal Effects	Light Duty Vehicles/Boats on Trailers Subject to Min. Weights. S/Bnd canoes 65.00 per canoe minimum	General Merchandise Single Lot shipments of less than 40,000 lbs. Subject to Minimum Weights. Over 40,000 lbs.-10%	Light Weight Items, Cubic Foot Items	Oversized Items, Square Foot Items	Minimum Charge includes GST
Hay River	0.1598	0.1598	0.1598			70.00
Tulita	0.1163	0.1163	0.1163			70.00
Lutsel K'e	0.2511	0.2511	0.2511			70.00
Norman Wells	0.1163	0.1163	0.1163			70.00
Aklavik	0.0691	0.0691	0.0691			70.00
Kasho Got'ine	0.1294	0.1294	0.1294			70.00
Inuvik/Tsii	0.0691	0.0691	0.0691			70.00
Bathurst Inlet	0.3995	0.2853	0.1998	2.9943	26.9616	70.00
Cambridge Bay	0.3995	0.2995	0.1998	2.9943	26.9616	70.00
Gjoa Haven	0.4898	0.3674	0.2450	3.6713	33.0584	70.00
Holman	0.2628	0.1970	0.1313	1.9697	17.7376	70.00
Kugluktuk	0.3471	0.2604	0.1736	2.6032	23.4395	70.00
Paulatuk	0.2353	0.1766	0.1177	1.7646	15.8895	70.00
Sachs Harbour	0.2166	0.1625	0.1083	1.6244	14.6259	70.00
Taloyoak	0.5230	0.3923	0.2616	3.9204	35.3013	70.00
Umingmaktok	0.3995	0.2995	0.1998	2.9943	26.9616	70.00

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NORTHERN TRANSPORTATION COMPANY LIMITED
2007 MACKENZIE-WESTERN ARCTIC GENERAL CARGO RATES
Rates per pound
All rates are subject to G.S.T.
(Goods not specific to classification or minimum weights)

FUEL SURCHARGE IS AN ADDITIONAL 3% ON TOP OF LISTED RATE

From Kasho to	Furniture Appliances Personal Effects	Light Duty Vehicles/Boats on Trailers Subject to Min. Weights. S/Bnd canoes 65.00 per canoe minimum	General Merchandise Single Lot shipments of less than 40,000 lbs. Subject to Minimum Weights. Over 40,000 lbs.-10%	Light Weight Items, Cubic Foot Items	Oversized Items, Square Foot Items	Minimum Charge includes GST
Tulita	0.0399	0.0399	0.0399			70.00
Hay River	0.1129	0.1129	0.1129			70.00
Lutsel K'e	0.1912	0.1912	0.1912			70.00
Norman Wells	0.0399	0.0399	0.0399			70.00
Aklavik	0.1672	0.1254	0.0837	1.2541	11.2933	70.00
Inuvik/Tsii	0.1672	0.1254	0.0837	1.2541	11.2933	70.00
Tuktoyaktuk	0.2584	0.1940	0.1294	1.9382	17.4532	70.00
Paulatuk	0.3703	0.2779	0.1851	2.7750	27.7795	70.00
Cambridge Bay	0.5554	0.4165	0.2777	4.1643	37.4967	70.00

ALL COLLECT SHIPMENTS ARE CHARGED A COLLECTION FEE OF $5.00 PER SHIPMENT
ALL RATES ARE BASED ON UNITIZED CARGO, SUITABLE FOR FORKLIFT HANDLING

Note: Minimum Weights
1. Trailers, modules, mobile buildings, set-up storage tanks exceeding 5,000 litres and similar bulky items subject to sq. foot price.
2. Lightweight items such as insulating materials, small fibreglass storage tanks not exceeding 5,000 litres. Set-up culverts and prefabricated items (such as trusses, wall panels and set-up cabinets) subject to cubic foot price.
3. Light Duty Vehicles subject to minimum weights: under 15' 3,000 lbs., 15'-18' 4,000 lbs.,18'-20' 5,000 lbs., over 20' + 500 lbs. Per foot.

Note: Unitizing/Palletizing charges extra as per categories listed below. Charges based on gross weight or measurement weight, whichever is greater.
1. Strapping : 1.50 per 100 lbs.
2. Strapping and Palletizing : 5.00 per 100 lbs.

NORTHERN TRANSPORTATION COMPANY LIMITED
2007 MACKENZIE-WESTERN ARCTIC GENERAL CARGO RATES
Rates per pound
All rates are subject to G.S.T.
(Goods not specific to classification or minimum weights)

FUEL SURCHARGE IS AN ADDITIONAL 3% ON TOP OF LISTED RATE

From Aklavik to	Furniture Appliances Personal Effects	Light Duty Vehicles/Boats on Trailers Subject to Min. Weights. S/Bnd canoes 65.00 per canoe minimum	General Merchandise Single Lot shipments of less than 40,000 lbs. Subject to Minimum Weights. Over 40,000 lbs n/bnd-10%	Light Weight Items, Cubic Foot Items	Oversized Items, Square Foot Items	Minimum Charge includes GST
Hay River	0.1295	0.1295	0.1295			70.00
Wrigley	0.1382	0.1382	0.1382			70.00
Reliance	0.2358	0.2358	0.2358			70.00
Norman Wells	0.1098	0.1098	0.1098			70.00
Kasho	0.0837	0.0837	0.0837			70.00
Tsii / Inuvik	0.1053	0.0791	0.0526	0.7894	7.1076	70.00
Tuk	0.1560	0.1170	0.0781	1.1700	10.5352	70.00
Holman	0.3607	0.2705	0.1804	2.7048	24.3556	70.00
Kugluktuk	0.3951	0.2965	0.1975	2.9609	26.6616	70.00

ALL COLLECT SHIPMENTS ARE CHARGED A COLLECTION FEE OF $5.00 PER SHIPMENT
ALL RATES ARE BASED ON UNITIZED CARGO, SUITABLE FOR FORKLIFT HANDLING

Note: Minimum Weights
1. Trailers, modules, mobile buildings, set-up storage tanks exceeding 5,000 litres and similar bulky items subject to sq. foot price.
2. Lightweight items such as insulating materials, small fibreglass storage tanks not exceeding 5,000 litres. Set-up culverts and prefabricated items (such as trusses, wall panels and set-up cabinets) subject to cubic foot price.
3. Light Duty Vehicles subject to minimum weights: under 15' 3,000 lbs., 15'-18' 4,000 lbs.,18'-20' 5,000 lbs., over 20' + 500 lbs. Per foot.

Note: Unitizing/Palletizing charges extra as per categories listed below. Charges based on gross weight or measurement weight, whichever is greater.
1. Strapping : 1.50 per 100 lbs.
2. Strapping and Palletizing : 5.00 per 100 lbs.

Rail Rates

CN Rail rates as of May 9, 2007:

Hay River to Edmonton - $3,300/ car – capacity 220,000 lbs (shipment and car).

Appendix F: Northern Alberta and the Northwest Territories Private Scrap Metal Collectors and Processors (includes Edmonton)

Company	Address	Telephone/Fax	Website/E-mail	Contact	Other
Northern Alberta					
Acme Car Flattners	5408, 176 Street Edmonton, AB T6M 1C6	T: (780) 487-6354 C: (780) 918-1881	jschwa@shaw.ca	Jack Schwartzberg	• Mobile car crusher • Sends auto hulks to GenAlta Recycling/General Scrap Partnership
Acme Scrap Iron and Metals Inc.	16405, 130 Avenue N.W. Edmonton, AB T5V 1K5	T: (780) 447-1623 F: (780) 447-2283			• Bins and hauling available for industrial and commercial sectors • Ferrous metal sent to Alta Steel/Scaw Metals and non-ferrous metal sent overseas
BJE Group, Inc.	9803, 99 Street High Level, AB T0H 1Z0	T: (780) 926-3999 F: (780) 926-3377	bill@billjenkins.ca	Bill Jenkins	• Mobile shearer • Scrap yard, 11km north of High Level on Highway 35, accepts all metal (e.g., auto hulks, white goods, ferrous and non-ferrous) • When markets are good, transports metal to Maple Leaf Metal up to three times a week • Metal bins at local landfill • Two balers, car crusher, magnets and scale at scrap yard
Canadian Consolidated Salvage Ltd.	10419, 96 Street N.W. Edmonton, AB T5H 2H6	T: (780) 424-0770 F: (780) 426-2902			• Purchase metal and sell • Bins and hauling available for industrial and commercial sectors • Metal sent to Alta Steel/Scaw Metals
#1295279 Alberta Ltd. (Formerly Dolcam Recycling)	Box 45 Atmore, AB T0A 0E0	C: (780) 608-0853 C: (780) 404-9336		Guy Campeau	• Mobile baler for white goods and semi crushes auto hulks • Transports scrap metal to GenAlta Recycling in Edmonton
GenAlta Recycling	P.O Box 3120	T: (888) 852-9288	genalta@telus.net	Brad Kerbs	• Processing facility with a heavy duty

Company	Address	Telephone/Fax	Website/E-mail	Contact	Other
Inc. Part of General Scrap Partnership	Sherwood Park, AB T8H 2T1 Yard: 9301, 34 Street Edmonton, AB	T: (780) 466-9010 F: (780) 461-2369			shredder capable of shredding whole automobiles, farm machinery, furnaces, hot water tanks, appliances and other scrap steel • Metal sent to Alta Steel/Scaw Metals and IPSCO
General Recycling Industries Ltd.	4120, 84 Avenue N.W. Edmonton, AB T6B 3H3 11915, 156 Street Edmonton, AB T5V 1E8	T: (866) 983-9999 T: (780) 461-5555 F: (780) 452-1736 T: (800) 222-6595 T: (780) 453-7000 F: (780) 452-1736	www.generalrecycling.com info@generalrecycling.com		• Purchase metal, process and sell • Ferrous and non-ferrous metal sold within Canada and exported internationally
General Scrap Iron and Metals Ltd.	11915, 156 Street N.W. Edmonton, AB T5V 1E8	T: (800) 222-6595 T: (780) 452-5865 F: (780) 452-1736		Mark People	• Purchase metal, process (limited) and sell • Accept white goods and auto hulks • Ferrous and non-ferrous metal sold within Canada and exported internationally
Grande Prairie Salvage Ltd.	9727, 128 Avenue Grande Prairie, AB T8V 4J2	T: (780) 532-8028 F: (780) 539-6565	gpsalv@telus.net		• Bins and hauling available for industrial and commercial sectors • Metal typically sent to the United States
Hilltop Auto Wreckers	Box 6342 Peace River, AB T8S 1S2	T: (780) 624-4611 F: (780) 624-4675		Kevin Jano	• Salvage automobile parts • Crusher on site • Stockpiles crushed auto hulks until enough to transport to GenAlta Recycling
HW Metals and Salvage Ltd.	14216, 97 Street Grande Prairie, AB T8V 7B7	T: (780) 532-0112 F: (780) 539-7060	hwmetals@xplornet.com		• Purchase metal, process and sell • Bins and hauling available for industrial and commercial sectors • Steel sent to Alta Steel/Scaw Metals in Edmonton • Non-ferrous metal sent to where the highest price is paid
Impala Auto	22403, 113 Avenue	T: (877) 447-3971	www.impalaautowrecking.com		• Salvage automobile parts

Company	Address	Telephone/Fax	Website/E-mail	Contact	Other
Wrecking	Edmonton, AB T5S 2S3	T: (780) 447-4696 F: (780) 451-0480			• Contract processor to crush and transport auto hulks to recycler
Inkahutz Steel and Salvage	P.O. Box 1243 Grinshaw, AB T0H 1W0	T: (800) 561-3542 T: (780) 332-4013 F: (780) 332-4867			• Process metal from businesses, farmers and oil field companies, and sell • No white goods or household metal • Ferrous metal sent to GenAlta Recycling/General Scrap Partnership
Internorth Salvage Ltd.	940, 8 Avenue Beaverlodge, AB T0H 0C0	T: (780) 354-8988 F: (780) 354-3545	darryld@telus.net		• Light metal bailing and automobile crushing • Salvages used auto parts
Maple Leaf Metal Industries Ltd.	4510, 68 Avenue Edmonton, AB T6B 2P3	T: (800) 661-8118 T: (780) 468-3951 F: (780) 465-9392	mleafm@telusplanet.net		• Purchase metal, process and sell • Bins and hauling available for industrial and commercial sectors • Ferrous metal stays locally • Non-ferrous metal is transported to eastern Canada, the United States and China
North-east Recyclers Ltd.	Box 2175 Lloydminster, AB S9V 1R6	T: (780) 871-0482 T: (780) 808-2199			• Accepts auto hulks, white goods, ferrous and non-ferrous metal • Baler and car crusher • Hire trucking firm to transport to market
PortaCrush	Box 588 Redwater, AB T0A 2W0	T: (780) 942-3699 T: (800) 717-2635 C: (780) 941-1880 F: (780) 942-4668	www.portacrush.ca porta@allstream.net	Ron Tomlinson	• Mobile baler and crusher with hauling services for light metal • Transports metal to GenAlta Recycling/General Scrap Partnership
Practical Auto Recyclers Ltd.	16743, 113 Avenue N.W. Edmonton, AB T5M 2X2	T: (780) 444-6591 F: (780) 452-0180	www.praticalauto.com part@practicalauto.com		• Salvage automobile parts • Hire hauler to transport vehicles to processor (e.g., General Scrap, Iron and Metals) • No exchanges of money for hauling; hauler receives money from processor
Rec-Vec ATV Parts and Services	Box 2016 Fairview, AB T0H 1L0	T: (780) 835-2007 F: (780) 835-2253	Recvec_atv@yahoo.com	Chuck Arcand	• Salvage parts, and aluminum and steel from quads, bikes and skidoos • Small business

Company	Address	Telephone/Fax	Website/E-mail	Contact	Other
Sunset Salvage	Box 5688 Fort McMurray, AB T9H 4V9	T: (780) 743-4618 F: (780) 743-3024	rhonda@sunsetrecycles.com		• Salvage ferrous and non-ferrous metal; no white goods, household items or electronics • Purchase metal, process and sell • Bins and hauling available for industrial and commercial sectors • Metal typically sent to the United States
Vandemark Salvage	PO Box 956 Manning, AB T0H 2M0	T: (780) 836-2129		Gale Vandemark	• Collects ferrous and non-ferrous metal including auto hulks and whit goods • Contracts out processing and transportation to recyclers as required • Bins available upon request
Northwest Territories					
Age Automotive Ltd.	107 Kam Lake Road PO Box 2108 Yellowknife, NT X1A 2P6	T: (867) 873-5528 F: (867) 873-4145	ageauto@theedge.ca	Garth Eggenberger	• Automobile salvaging • $100 fee per vehicle • Removes oil tank, gas tank, batteries and tires and crushs vehicle • Crushed automobiles are transported by private hauler to GenAlta Recycling in Edmonton
C & C Recycling	PO Box 876 Yellowknife, NT X1A 2N6	T: (867) 873-8150 C: (867) 669-1242 F: (867) 920-2490	ldmaint@northwestel.net	Lloyd Lush	• Accepts non-ferrous metal at this time • Grimshaw trucking transports metal to General Recycling in Edmonton • Looking into purchasing equipment to process tires and scrap metal (e.g., galvanized steel, auto hulks)

Appendix G: PortaCrush Education Documents – What is Wrong with this Picture? (2007b)

WHAT'S WRONG WITH THIS PICTURE?

MOUNTAIN OF GARBAGE WITH WHITE GOODS

WHAT'S WRONG WITH THIS PICTURE?

WIRE CABLE PRESENT

WOOD PRESENT

Appendix H: Funding Opportunities

Municipal Rural Infrastructure Fund (2005 – 2010)

The Municipal Rural Infrastructure Fund, a joint federal, provincial/territorial, and municipal funding option, supports municipal infrastructure such as water and wastewater treatment, or cultural and recreation projects, for smaller and First Nations communities. The overall target for the $1 billion Municipal Rural Infrastructure Fund across Canada centers on 60% of projects to provide environmental benefits.

Alberta

The Canada-Alberta Municipal Rural Infrastructure Fund is a joint initiative between the Governments of Canada and Alberta that enables rural and urban communities to address local infrastructure needs. This federal-provincial agreement provides $88 million each with matching one-third contributions from municipalities, totaling $264 million. All project approvals are decided on a competitive basis and the second call for projects started in April 2007.

At least 80% of the funding is dedicated to rural municipalities with a population of less than 250,000. The remaining 20% is available to urban municipalities with populations greater than 250,000.

A minimum of 55% of the fund is dedicated towards green infrastructure projects that contribute to community economic development and environmental quality of life. These include water, wastewater, solid waste, environmental energy improvements, and public transit.

On March 23, 2007 it was announced the Canada-Alberta Municipal Rural Infrastructure Fund contributed $610,806 towards the Peace Regional Recycling Centre in Northern Sunrise County. This recycling facility plans to divert recyclables, salavagables, and compostables from regional landfills.

Detailed information is located at www.camrif.ca.

Northwest Territories

The Municipal Rural Infrastructure Fund supports all territorial communities, including First Nations, translating into joint federal-territorial community infrastructure funding of $32 million over five years in the Northwest Territories. With matching investments by the six tax-based territorial communities (Fort Simpson, Fort Smith, Hay River, Inuvik, Norman Wells, and Yellowknife) and $16 million each from the federal and territorial governments, there is expected to be $39 million in total infrastructure investments made through this program.

Governments of Canada and the Northwest Territories have agreed to provide up to 55% of the Fund for 27 non-tax-based communities and at least 45% for tax-based communities. In non-tax-based communities, the federal government has committed

to contribute up to 50% of eligible costs of a given project and the Government of the Northwest Territories provides the remaining 50% contribution. In the tax-based communities, Canada has committed to contribute up to 33% in total eligible project costs over the life of the program and the Government of the Northwest Territories has committed to match this federal contribution.

80% of the Fund in the Northwest Territories is reserved for green projects while 20% of the funding for tax-based communities supports innovative green projects.

At this time all funds are committed to Northwest Territories projects, however, the federal government has granted $1.4 million top up. This additional funding is available to tax-based communities that can spend two-thirds of project costs while the federal government contributes a third. No additional funding is available through the territorial government for this top up.

For more information visit http://www.infrastructure.gc.ca/ip-pi/mrif-fimr/news-nouvelles/2005/20050118yellowknife_e.shtml.

Green Municipal Fund

The Government of Canada has endowed $550 million dollars to the Federation of Canadian Municipalities to establish and maintain the Green Municipal Fund (GMF). This is the only national fund dedicated to the needs of municipal governments and their partners pursuing environmental initiatives.

This Fund supports activities leading up to and including the implementation of environmental infrastructure projects:

Planning - A project activity that demonstrates an integrated, systems approach to addressing community wide sustainable, energy, and environmental management objectives. Several different types of plans and planning processes may relate to Sustainability Communities, Sustainable Neighbourhoods, Green House Gas Local Action, Brownfield Redevelopment, or Community Energy.

Feasibility Study - An assessment of the technical, environmental, and/or economic feasibility of an environmental project. A feasibility study may include reviewing the current system or situation, identifying requirements for the proposed environmental infrastructure project, and reporting the effects and financing options associated with implementing the proposed project.

Field Test - A test of the environmental project's performance under operational conditions. For example, a field test may assess a small-scale installation of a new system or technology to determine the implications of installing the system or technology on a larger scale.

Capital Installation - Implementation of an environmental infrastructure project after a study has deemed it to be feasible.

Two funding options exist within the GMF:

1) Grant funding for feasibility studies, field tests, and sustainable community plans
    - GMF grants can cover up to 50% of the total eligible costs of an approved project up to a maximum of $350,000
    - Applications accepted on a continuous basis with no deadline
    - Only two projects have received funding for solid waste management projects in Northern Alberta and the Northwest Territories
        - City of Grande Prairie received a $15,000 grant for a Landfill Gas Recovery Study in 2001-2002
        - City of Yellowknife received a $16,500 grant for the Implementation of a New Solid Waste Strategy Program in 2002-2003

2) Loan and grant funding for capital projects through a competitive Request for Proposals (RFP) process
    - GMF awards up to $10 million in loans and up to $1.6 million in grants
        - Loans range from 25-80% of eligible project costs based on projected total diversion with a maximum of $3 million per project
        - Grants are based on a minimum projected diversion of 50%, and are distributed for up to 50% of eligible project costs with a maximum of $250,000
        - Loan or loan and grant combination can not exceed 80% of eligible project costs
    - Waste sector RFP process
        - GMF issued RFP: February 14th, 2007
        - Intent to Apply forms deadline: March 14th, 2007
        - Detailed proposal deadline: May 1st, 2007
        - Funding decision: September 2007

At this time, Northwest Territories communities are only allowed to apply for Green Municipal Fund grants as the Federation of Canadian Municipalities is not considered an authorized lender pursuant to Northwest Territories debt regulations. However, if a community is working in a partnership, the partner may apply for a loan.

Detailed information regarding the GMF can be found at http://sustainablecommunities.fcm.ca/GMF/.

New Deal for Cities and Communities (2005 – 2015)

This program provides municipalities with a share of gas tax revenues to be used in addressing sustainable municipal capital infrastructure needs. Over a five year period the Government of Canada anticipates providing $5 billion dollars to municipalities to support environmentally sustainable infrastructure projects such as public transit, water and wastewater treatment, community energy systems, and handling of solid waste.

Funding is distributed to provinces, territories, and First Nations on a per capita basis. Over five years Alberta anticipates $476.9 million and the Northwest Territories $37.5 million.

The Alberta Government plans to distribute all funds to eligible municipalities in annual or semi-annual increments over the first 5 years of the program up to their maximum allocation. This program provides conditional grants for capital-related projects which meet the program eligibility criteria and there is no requirement for a municipal funding contribution to projects accepted under this program.

Alberta Municipal Infrastructure Program (2005 – 2015)

This is a Government of Alberta initiative to assist municipalities with capital infrastructure projects.

Funding under this program supports the development, enhancement, and rehabilitation of core capital infrastructure projects, such as municipal roads, bridges, public transit vehicles and facilities, water and wastewater systems and facilities, storm drainage systems and facilities, emergency service vehicles and facilities, and infrastructure management system software.

Grants under this program are paid to each eligible municipality in annual increments over the first 5 years of the program up to their maximum allocation. Following the first five year period, municipalities have an additional five years to complete the projects initiated under the program.

Based on estimated 2006 census populations, each municipality receives a grant allocation of approximately $180 per capita per year for the first three years of the program.

The program provides conditional grants for capital-related projects which meet program eligibility criteria and there is no requirement for a municipal funding contribution to projects accepted under this program.

New Deal for NWT Community Governments

Funding for planning studies, feasibility studies, and infrastructure is provided by the Government of the Northwest Territories Municipal and Community Affairs Department totaling $28 million on an annual basis. Each community receives $560,000 followed by additional formula calculations based on population size. In 2007, Northwest Territories communities anticipate to receive between $600,000 and $2.5 million.

EcoAction

The EcoAction Community Funding Program is an Environment Canada program that provides financial support to community groups for projects that have measurable, positive impacts on the environment. EcoAction encourages projects that protect, rehabilitate or enhance the natural environment and builds the capacity of communities to sustain these activities into the future. At this time, funding priority may be given to eligible projects that address Clean Air and Climate Change issues.

Non-profit groups and organizations are eligible to apply to the Funding Program. This includes, but is not limited to: community groups, environmental groups, aboriginal

groups and First Nations councils, service clubs, associations, and youth and seniors organizations.

To receive EcoAction funding the project must have matching funds or in-kind support from other sources. Submission deadlines to the Funding Program are February 1st and October 1st annually.

This program has provided funding for the following related projects:

Alberta

- St. Paul Abilities Network Recycle
- Wood Recycling

Northwest Territories

- Aklavik Large Refuse Community Clean-up Relocation
- Inuvik Recycling Program
- Tuktoyaktuk Waste Management Program
- Waste Management for Centenary Commemoration

For more information visit www.ec.gc.ca/ecoaction/what_is_e.html