SAYISI DENE FIRST NATION
WASTE & RECYCLING INITIATIVE
REPORT & PLAN

August 30, 2018

created for

Sayisi Dene First Nation

by

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SUMMARY

This document summarizes:

1. The state of recycling and waste management in and around the Sayisi Dene First Nation (SDFN) reserve on the northwest shore of Tadoule Lake, before the start of this project.

2. Steps taken during the current project to improve recycling and waste management in and around the community.

3. A Waste & Recycling Management Plan for SDFN. If implemented, this Plan will enable SDFN to manage and recycle all the community's wastes in a sustainable, cost-effective manner.

1. RECYCLING & WASTE MANAGEMENT TO DATE

The people of Sayisi Dene First Nation (SDFN) feel a deep sense of responsibility to the land, the water, and the air. In discussions, members of the community repeatedly emphasized that taking up that responsibility and keeping the world around them clean goes to the heart of what it means to be Dene.

At the same time, these same members of SDFN recognize that the management of waste on and around their reserve land, to date, has not met this responsibility. There has been virtually no recycling and waste management has not been adequate to meet the needs of the community.

This contradiction between deeply-held values and activities to date is a source of frustration and concern for many in the community. (It is also common to many communities throughout the world; human beings rarely fulfill this responsibility.)

1.1. Current Waste Collection Process

Sayisi Dene Public Works provides a regularly scheduled waste collection service. There is currently no recycling or organic waste diversion program.

1.1.1. WASTE SOURCES

There are about 85 homes and 10 community businesses and institutions which produce waste. The community businesses and institutions include:

- Peter Yassie Memorial School
- Public Works Garage
- Manitoba Hydro generating station
- Northern Store
- Band Office
- Band Hall
- Airport
- Health Centre offices
- Health Clinic
- Daycare & Hotel
- Land Claims Office
- Awasis

There are no businesses or institutions that generate waste on a regular basis that need special handling (*e.g.* no oil change shops or businesses producing toxic or dangerous waste).

The Public Works Garage is the primary generator of used oil within the community. The Manitoba Hydro facility also generates considerable used oil, but this is currently shipped out by winter road and handled in Winnipeg.

A used-oil furnace system was sent up on the winter road in February 2018 and is expected to be operational in Fall of 2018.

1.1.2. WASTE COLLECTION

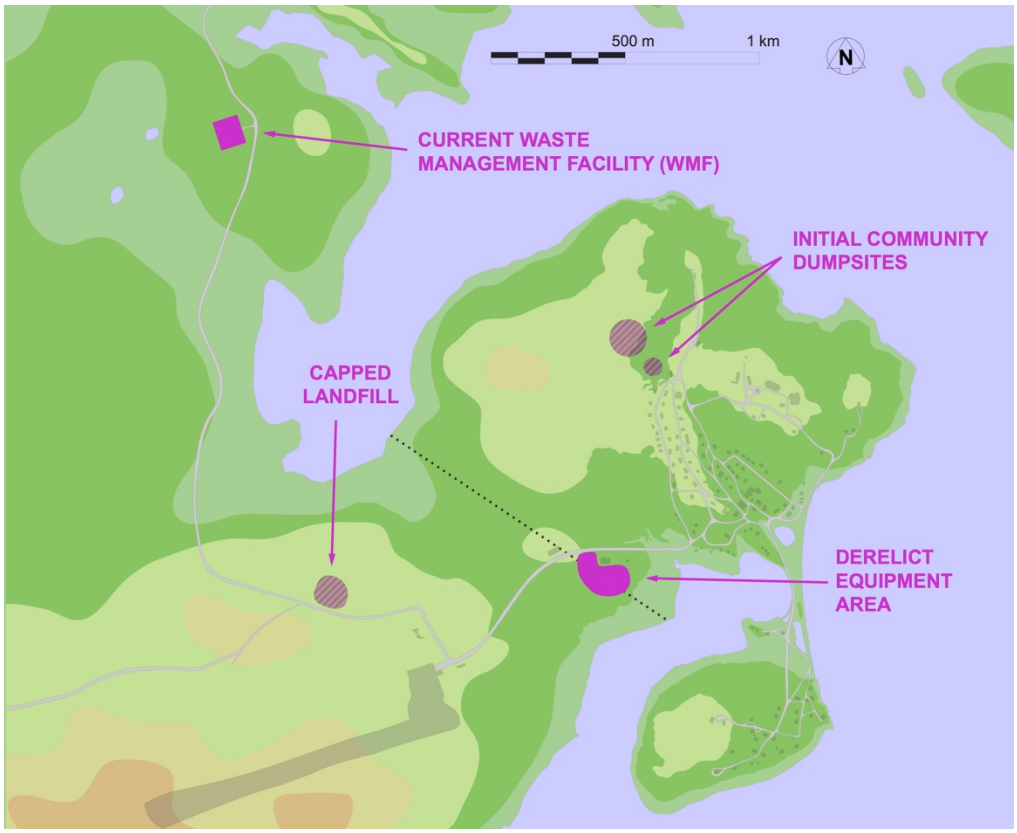
Although Public Works staff collects trash, there are no standardized collection containers.

There is also no consistent system for how people make their trash available for collection. Sometimes, the Public Works staff goes into buildings to collect bags of garbage. Some people put household garbage into institutional collection bins. People sometimes take trash to the landfill themselves. As well, some people use burn barrels in their yard (although this is becoming less common).

1.2. Waste Sites

This community is using its fourth waste site in only 50 years. The first two were small, informal sites. The third required mitigation. It is capped and not in use, although there are some derelict appliances and metal materials stacked along its edges. The fourth is the current one.

Figure 1: Waste Sites in and near Sayisi Dene First Nation



1.3. *Initial Dumpsites*

The first two sites (marked "INITIAL COMMUNITY DUMPSITES" in Figure 1) were informal sites and began to be used when the community was initially established in 1973. They were abandoned when a more formal landfill area (marked "CAPPED LANDFILL") was established in (approximately) 1999.

Both of these initial dumpsites are on reserve land (Churchill 1).

On an initial, visual inspection, it would appear that these sites do not present a current contamination challenge. However, they need to be investigated in the next phase of this initiative (see below) to determine if this is correct.

1.4. *Capped Landfill*

In (approximately) 1999, a new waste site was established the community is approximately 500 m west of the reserve border.[1] This site is marked in Figure 1 as "CAPPED LANDFILL".

[1] The reserve border is marked in Figure 1 with a dotted black line. Land to the east of that line is reserve land. Land to the west is provincial Crown Land.

Aski Geosciences, in their report on this site[2] reported numerous problems during its operation:

"Scattered solid waste including a mixture of household wastes, building materials, animal carcasses, and bulky metals had been observed across the area. Burning of some household waste was a regular practice, which was not undertaken in a Burn Cage or by trained personnel. No separation or recycling of the general waste stream, or signage informing residents of the dumping areas were visible, nor were there any berms or fences to contain waste within the site or prevent transportation of leachate. The site had unrestricted public access and did not include wildlife fencing to mitigate against access to the landfill site by large animals….

[It] lacked any methods for controlling the transportation of waste or leachate by physical transportation methods (i.e. wind and precipitation) or vectors. The configuration of the former landfill presented a risk to both human and environmental health."

Figure 2: Capped Landfill Site Prior to Consolidation and Capping

Source: Aski Geosciences "Summary Report…"

This site never had a provincial operating permit and was ordered decommissioned by the Province of Manitoba.

The site was decommissioned by Sigfusson Northern in (approximately) 2015.

[2] This report is titled "Summary Report for the Closure of the Existing Community Waste Disposal Site Sayisi Dene First Nation, Tadoule Lake, MB". It was completed in December 2015, and is available for download at http://bokeconsulting.com/wp-content/uploads/2018/08/ENV-303-SOLID-WASTE-SAYISI-DENE-SUMMARY-REPORT-CLOSURE-OF-EXISTING-COMMUNITY-WASTE-DISPOSAL-SITE-1627585_.pdf

Figure 3: Capped Landfill as of June 2017

Waste metal was gathered at three points on the periphery of the decommissioned site.

Figure 4: Piled Metals on Periphery of Capped Landfill (1)

Figure 5: Piled Metals on Periphery of Capped Landfill (2)

Figure 6: Piled Metals on Periphery of Capped Landfill (3)

Aski Geosciences installed monitoring wells at this site in October 2015, took groundwater samples, and had them tested to establish a baseline for future years.

Table 1: Baseline Groundwater Chemistry Results, Capped Landfill, December 2015[3]

Parameter	Unit	Sample I.D.	
		MW1	MW2
Inorganics			
Alkalinity – Total	mg/L	50.3	75.5
Ammonia – Total	mg/L	0.017	<0.0050
Arsenic - Total	ug/L	<0.10	0.21
Calcium Carbonate	mg/L	251	69.9
Chloride - Dissolved	mg/L	110	2.1
Nitrate	mg/L	1.3	0.258
Nitrite	mg/L	0.002	0.011
Total Kjeldahl Nitrogen	mg/L	0.196	0.059
Total Phosphorous	mg/L	0.0512	0.0257
Total Dissolved Solids (TDS)	mg/L	358	58
Sulphate - Dissolved	mg/L	68.2	1.91
Dissolved Hardness ($CaCO_3$)	mg/L	242	67.2
Dissolved Metals by ICPMs			
Dissolved Aluminum (Al)	ug/L	40.2	29.9
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50
Dissolved Arsenic (As)	ug/L	<0.10	0.11
Dissolved Barium (Ba)	ug/L	122	28.7
Dissolved Beryllium (Be)	ug/L	<0.10	<0.10
Dissolved Bismuth (Bi)	ug/L	<1.0	<1.0
Dissolved Boron (B)	ug/L	<50.0	<50.0
Dissolved Cadmium (Cd)	ug/L	0.234	0.057
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0
Dissolved Cobalt (Co)	ug/L	0.84	<0.50
Dissolved Copper (Cu)	ug/L	0.74	3.46
Dissolved Iron (Fe)	ug/L	46.8	13.8
Dissolved Lead (Pb)	ug/L	<0.20	0.29
Dissolved Lithium (Li)	ug/L	32.3	9.3

[3] Source: Aski Geosciences "Summary Report…" (Listed as "Table 3" in Aski Geosciences report.)

Dissolved Metals by ICPMs (Cont'd)			
Dissolved Manganese (Mn)	ug/L	125	18.3
Dissolved Mercury (Hg)	ug/L	<0.010	<0.010
Dissolved Molybdenum (Mo)	ug/L	<1.0	1.6
Dissolved Nickel (Ni)	ug/L	15.6	5.4
Dissolved Selenium (Se)	ug/L	0.23	0.27
Dissolved Silicon (Si)	ug/L	16,400	15,900
Dissolved Silver (Ag)	ug/L	<0.020	<0.020
Dissolved Strontium (Sr)	ug/L	170	64
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050
Dissolved Tin (Sn)	ug/L	<5.0	<5.0
Dissolved Titanium (Ti)	ug/L	<5.0	<5.0
Dissolved Uranium (U)	ug/L	0.54	0.42
Dissolved Vanadium (V)	ug/L	<5.0	<5.0
Dissolved Zinc (Zn)	ug/L	15.8	13.0
Dissolved Zirconium (Zr)	ug/L	<0.50	<0.50
Dissolved Calcium (Ca)	mg/L	48.8	17.4
Dissolved Magnesium (Mg)	mg/L	29.1	5.73
Dissolved Potassium (K)	mg/L	7.00	3.09
Dissolved Sodium (Na)	mg/L	12.9	8.12
Dissolved Sulphur (S)	mg/L	24.3	<3.0
Volatile Organic Compounds (VOC's)			
Benzene	ug/L	<0.40	<0.40
Toluene	ug/L	<0.40	<0.40
Ethyl-benzene	ug/L	<0.40	<0.40
Xylenes	ug/L	<0.80	<0.80
F1 (C6-C10)	ug/L	<300	<300
Other Organics			
Dissolved Organic Carbon (DOC)	mg/L	2.06	0.84
Chemical Oxygen Demand (COD)	mg/L	<10	<10

Their report indicated that "Annual monitoring of the groundwater must be undertaken by qualified environmental personnel to ensure compliance with the regulation and closure requirements. Subsequent reports must be provided to Manitoba Conservation." This does not appear to have been done.

1.5. Current Waste Management Facility

As the site discussed above was being decommissioned, a new site (marked "CURRENT WASTE MANAGEMENT FACILITY (WMF)" in Figure 1) was established approximately 3 km northeast of the community, on the all-season which leads to the community retreat area and to Stony Lake.

There are some improvements to the current Waste Management Facility (WMF) compared to the previous site:

- Berms surround two cells
- A rudimentary fencing system restricts some loose garbage from blowing away in the wind
- Bulky metals are (mostly) excluded

However, many of the problems of the previous site are being repeated in current the WMF:

- Unrestricted public access
    - No set hours
    - Gate is always left open
- No signage informing residents of appropriate dumping areas
- No separation of recyclables from the general waste stream
    - Neither organic nor inorganic recyclables are separated
- Frequent, uncontrolled burning of household and Northern Store waste
    - No Burn Cage
    - Burning not conducted by trained personnel
    - Ongoing risk of forest fires
- Deposited waste is not covered
    - Winds blow lighter pieces of waste out of the WMF and into surrounding areas
- Fencing not adequate to exclude wildlife

Figure 7: Entrance to Current Waste Facility (Prior to Cleanup)

Figure 8: View of South Cell from Central Berm

Figure 9: View of North Cell from Central Berm

Figure 10: Loose Garbage Caught by Fencing Around Landfill

Figure 11: Area Immediately Outside Current Waste Facility

The hard truth is that the current waste facility is not been sustainably operated. Even though it's only been open a few years, it's clear that, unless operational practices change significantly, this facility will end up in the same difficulty as the previous site.

The good news is that it is not too late to bring the current waste site up to professional, sustainable practices; history has not yet repeated itself. However, without significant change, it will.

1.6. Derelict Equipment Area

As worrying as current waste operations and maintenance of the current waste facility are, the derelict equipment accumulated around and behind the Public Works Garage may be an even bigger problem.

In this area (marked "Derelict Equipment Area" on Figure 1), hundreds of pieces of derelict equipment (and thousands of parts and small equipment) are scattered around an area at least double the size of the current Waste Management Facility.

Figure 12: Derelict Equipment Area (1)

Figure 13: Derelict Equipment Area (2)

Figure 14: Derelict Equipment Area (3)

Figure 15: Derelict Equipment Area (4)

The volume of material is worrying. Equally worrying, the derelict equipment is not separated from the useable equipment and building materials stored immediately around and behind the Public Works Garage This comingling makes it difficult to determine what materials are waste and what are intended for future use. In practice, this results in significant amounts of useable equipment and building materials—and money—being wasted.

Figure 16: Adjacent to Public Works Garage (1)

Figure 17: Immediately Behind Public Works Garage (2)

Cleaning up this area is possible. In fact, many of the derelict trailers can be reused in a Transfer Station for recyclables. And much of the heavy equipment can be sold for parts or as scrap steel, recouping some of the cost of decommissioning and shipping.

However, actually cleaning up the area will take a number of years, and require sustained coordination between waste and recycling staff, works and operations staff, band administration leadership, and Chief and Council.

1.7. Other Waste Issues

Members of the community have expressed frustration with the litter in their community.

Figure 18: Roadside Litter in Community After Spring Thaw

Community members noted that this year's spring cleanup had not been as thorough as in past years.

Members also expressed frustration with the derelict buildings and a small number of derelict vehicles in their community.

Figure 19: Derelict House Foundation in Rockville

Figure 20: Derelict Truck in South Point

Some community members also expressed concern that some (although by no means all) community members throw pop cans, bottles and empty cigarette packages "anywhere they feel like it".

Others expressed frustration that there are virtually no public garbage or recycling bins.

While these problems are not as severe as in many other communities, they still affect members' quality of life.

1.8. Reasons for Optimism

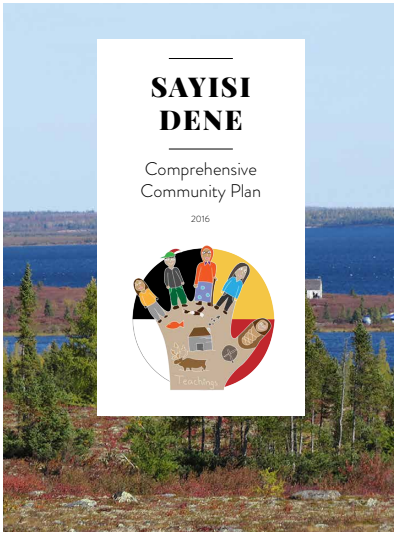
While SDFN clearly has significant waste challenges, there are good reasons for optimism:

1. Waste and recycling issue prioritized in Comprehensive Community Plan
2. A weekly garbage pickup system
3. Care of the camping and retreat area
4. The awareness that the community chose their current location

1.8.1. PRIORITY IN THE COMPREHENSIVE COMMUNITY PLAN

After extensive consultation and discussion, Sayisi Dene published a Comprehensive Community Plan (CCP) in 2016[4].

Figure 21: Sayisi Dene Comprehensive Community Plan



The priorities of better waste management and recycling appear a number of times in the CPP.

- *Sayisi Dene Vision*[5] articulates an obligation of:
  - "We will be the keepers of our lands for the rest of eternity, as we have been since time immemorial."
- *Long Term Goals: Lands & Resources*[6] sets the goal of:
  - "We will take care of our lands and resources."

[4] Available for download at http://bokeconsulting.com/wp-content/uploads/2018/08/SAYISI_DENE_COMPREHENSIVE_COMMUNITY_PLAN.pdf

[5] Page 13.

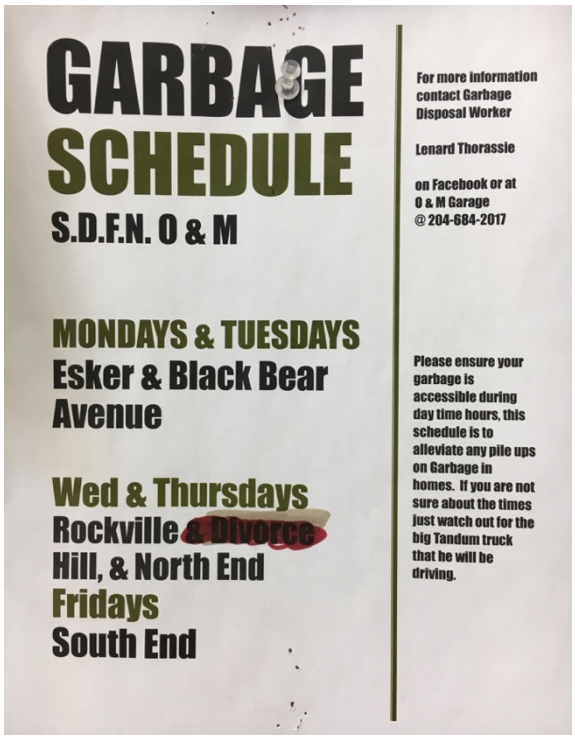
[6] Page 15.

- *Current Priorities: Lands & Resources*"[7] includes:
  - "Establish a recycling program in Tadoule Lake"
- The more detailed section *Lands & Resources, Goal B: We will take care of our lands and resources*[8] sets out both programs and projects:
  - *Programs* include:
    - "Make community gatherings more environmentally friendly – people can bring their own dishes instead of using Styrofoam
    - Establish a recycling program in Tadoule Lake"
  - *Projects* include:
    - "Establish a better dump site and dump procedures to prevent garbage from spreading"

1.8.2. WEEKLY GARBAGE PICKUP

Weekly garbage pickup occurs, despite the lack of garbage bins beside people's homes. Currently, an older-model cube van is used for garbage pickup.

Figure 22: Posted Garbage Pick-Up Schedule



[7] Page 16.

[8] Pages 69-70.

1.8.3. RETREAT AREA

The retreat and camping area just north of the current Waste Management Facility is kept scrupulously clean.

Figure 23: Retreat & Camping Area 1 km North of the Current Waste Facility

1.8.4. CHOOSING THIS LOCATION

Unlike many other First Nations, SDFN was not "put" on this spot by treaty or government decision. They chose it. Current community members know that their elders chose this location on the northwest shore of Tadoule Lake as a place to live after leaving Churchill, in part, for its beauty.

Figure 24: View of the Community from the Beach Area

Figure 25: Beach Area Beside the Community After a Storm, South End in Background

Figure 26: Beach Area Beside the Community After a Storm – Rockville in Background

2. THE CURRENT PROJECT

2.1. Project Startup

This project was initiated in late 2017 SDFN Chief and Council in discussions with members of the Boke Consulting team. A Council Consensus Form was signed[9] with Councillor Robert Powderhorn designated by the motion to take the lead on this project within Council.

Initial community liaison was provided by Walter Duck, a former Council member.

An application was made on January 6, 2018 to Indigenous Services Canada under the Lands & Economic Development Service Program (LEDSP) using the First Nation Solid Waste Management Initiative Proposal Form.[10]

Funding of $59,246 was committed by Indigenous Services Canada and the total funds were transferred to the SDFN on March 27, 2018.

Table 2: Budget Summary[11]

cost category	*budget amount*
Professional and technical services	$19,000
Meetings	$1,600
Communications	$500
Training delivery and trainee costs	$3,120
Work experience initiatives	$7,800
Salaries and wages	$4,500
Travel	$14,400
Overhead	$5,386
Other	$2,940
total	*$59,246*

The letter notifying the band of the funding was mislaid and Band Administration was not aware that this funding was received. Confirmation of funding was not located until late April, 2018. Nevertheless, activity began on the project immediately after the application was made—in January 2018. Boke Consulting flowed funds from its own account in order to get the project underway.

[9] Attached as Appendix 1: Council Consent Form Initiating Project.

[10] Attached as Appendix 2: LEDSP Application.

[11] A detailed budget breakdown is given on the last page of Appendix 2: LEDSP Application.

2.2. Project Components

2.2.1. LEARNING ABOUT WASTE AND RECYCLING

Walter Duck and Bruce Duggan, a member of the Boke Consulting team, spent a number of days touring the community and the surrounding area, taking an inventory of derelict vehicles, equipment, buildings and materials, and looking at current waste management practices.

Walter Duck and Curt Hull, another member of the Boke Consulting team, attended the Northern Manitoba Sustainable Waste Management Workshop in Thompson in February 2018.

Figure 27: Agenda – Northern Manitoba Sustainable Waste Mgmt Workshop, Day 1

Day 1 – Tuesday, February 13, 2018		
Time	**Agenda Item**	**Details**
8:30am	Registration	Registration
9:00am	Welcome and Introductions	Opening remarks and introduction (Moderator: Mike Fernandes)
		Opening Prayer (community elder to be invited by KTC)
		Greetings & Welcome • Keewatin Tribal Council representative (George Neepin, CEO) • Indigenous & Northern Affairs Canada (Tebesi Mosala, INAC) • City of Thompson (Mayor Dennis Fenske)
		Workshop Participants to introduce themselves
9:45am	Sustainable Waste Management – The challenge and opportunity for Northern Manitoba communities	Video – Solid Waste Management (INAC Manitoba)
		Benefits of Recycling and Overview of What Can be Recycled in Manitoba (Mike Fernandes)
		Starting a Recycling Program - A Toolkit for Manitoba First Nations and Northern Communities (Beth McKechnie, Green Action Centre)
10:30am	Morning Break	
10:45am	Facilitated Table Work & Group Discussion	Handout: Developing a focused vision and priorities for moving forward (Mike Fernandes)
		Exercise Questions (Each community to work on filling out their own sheet)
		Full Group discussion: Sharing our experiences, our community vision, and ideas of who might be good champions
11:30am	Planning Collection and Storage of Recyclable and Divertible Materials (Practical Options for northern communities)	RM of Rockwood – An example of a simple, effective and sustainable waste management site (Art Goudy)
		Community Clean Up Events – A Practical Way for Smaller Communities to Start Recycling (Christa Rust, CBCRA)
12:10pm	Lunch & Networking	
1:00pm	Planning where and how you'll send the recyclable materials out of your community	Sending materials to a Regional Processor (Billie Jo Thompson, TRC)
		Arranging direct pickup of certain materials (Dennis Neufeld, EPRA)
		Shipping materials from your community through back-haul arrangements and special considerations for winter road and remote communities (Cameron Graham)
2:15pm	Afternoon Break	
2:30pm	Old, abandoned cars (End-of-Life Vehicles) – A big waste problem for many northern communities	Managing End-of-Life Vehicles in an environmentally sustainable manner (Scout Environmental)
		Managing Lead Acid Batteries (Colin McKean)
3:20pm	Success Stories – Northern Communities who have started on the path to sustainable waste management	St. Theresa Point (CBC News clip and representative from St. Theresa and Solomon Mason)
		City of Flin Flon and area (Deb Odegaard)
		City of Thompson's recycling activities and future plans (pending Wayne Koversky or alternate)
		OCN – past success and future plans (pending Zacc Moore)
4:20pm	Closing Comments	Instructions for Day 2 tours ***Meet back here at Army Navy Hall (Please don't be late. Bus will leave at 9:10am with or without you.)***

Figure 28: Agenda – Northern Manitoba Sustainable Waste Mgmt Workshop, Day 2

Day 2 - Wednesday, February 14, 2017		
Time	**Agenda Item**	**Details**
8:30am	Sign in/Gathering	Registration
9:00am	Tour (Bus will leave Army & Navy Hall at 9am)	City of Thompson Waste Management Site
		Thompson Recycling Centre
12:00pm	Lunch & Networking	
1:00pm	Group Working Session 1 – Communities will work directly with support teams to develop action plans for moving forward in implementing recycling/diversion of the highest priority materials	At this point in the workshop, communities will be split into groups, according to the priority they identified in Day 1. Each group will be assigned the appropriate stewardship program operator, relevant technical experts in attendance, INAC support person(s) and other supports. The discussion will be community led (with support and prompts from group facilitator as needed) and they will work on specific questions they need answered in order start recycling the materials they've chosen as their top priority (ex. what equipment and supplies will we need? how do we complete the registration forms for your program? How exactly do we set up the collection site? Who do we call when we're ready to have the material picked up?)
2:10pm	Afternoon Break	
2:20pm	Funding for sustainable waste management in FN and Northern communities	INAC funding and assistance – how to complete an application for funding for the program you want to start (INAC representative)
		Group Working Session 2 – Communities will return to their support team to brainstorm how they can put together a funding proposal/application that includes the information they worked through in Group Working Session 1
3:15pm	Educating and Engaging the people in your community	Getting the right people on board (Mike Fernandes)
		Educating and engaging students and youth (Green Action Centre)
4:00pm	Closing	Prizes and Appreciation to participants (to save time, winners may be drawn at the break)
		Closing Prayer

2.2.2. STARTING A COMMUNITY CONVERSATION

A community engagement and discussion meeting, titled "Let's Talk Trash", was held in the Band Hall.

Figure 29: Poster for "Let's Talk Trash" Community Meeting

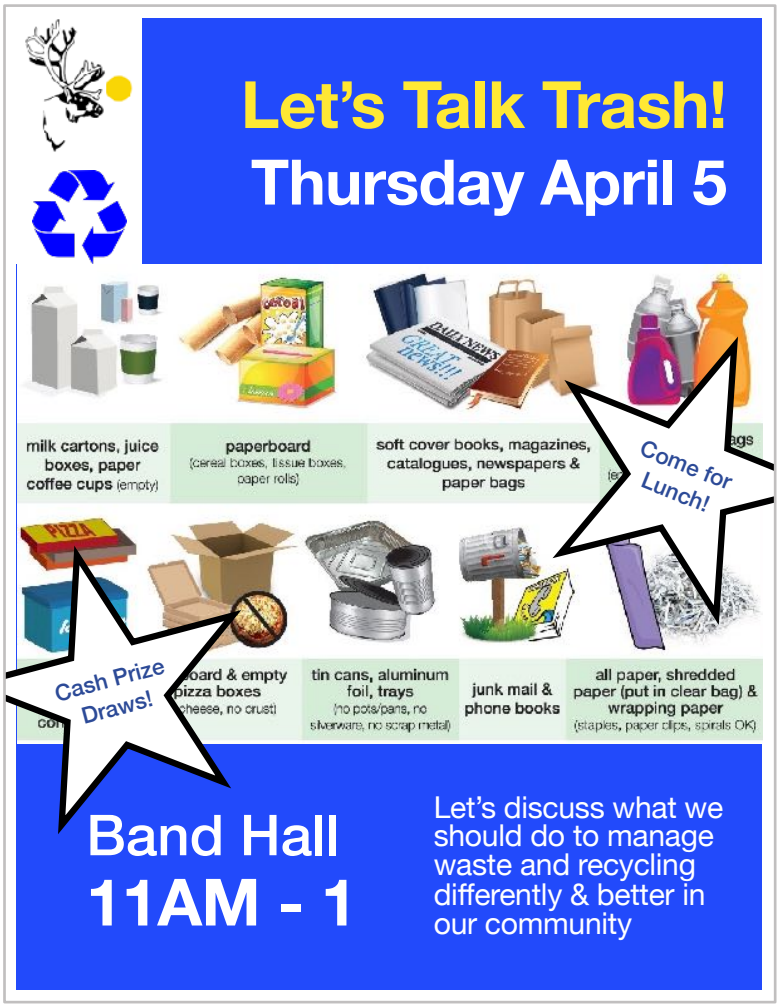


Figure 30: Agenda for "Let's Talk Trash" Community Meeting

Agenda

1. Welcome / Opening Prayer
2. What brings me here
3. What brings us together today
4. What we hope for today
5. What is proposed
6. Discussion
7. Next steps

During this meeting, Curt Hull gave a slide presentation, outlining potential waste and recycling options for SDFN, and putting the management of waste into the broader contexts of economic development and sustainability, as well as outlining relevant activities in other communities.

Community members shared their frustrations and aspirations about waste and recycling in their community.

Figure 31: Let's Talk Trash Community Meeting

In addition to participating in the discussion, people who attended the meeting—as well as some other community members—filled out a survey.

Figure 32: Form for Survey on Waste & Recycling

Waste & Recycling Survey

Question	I'm not concerned / interested	I'm sort of concerned / interested	I'm quite concerned / interested	I'm very concerned / interested
The landfill (dump) is not managed. Is the current state of the dump a concern to you?				
Is the way we manage waste and recycling in the community now of concern to you?				
Does it concern you that the only thing we do with waste is put it in the dump?				
Would you like to see a system for recycling established in our community?				
If a recycling system was established, would you bring things to a recycle depot?				
If a recycling system was established, would you like to have household pick up?				
If we set up a recycling depot, there would be jobs sorting material. Would you be interested in this kind of employment?				
Share your ideas / Comments				

Name:	Phone:	E-mail:

Twenty-three people filled out the survey.

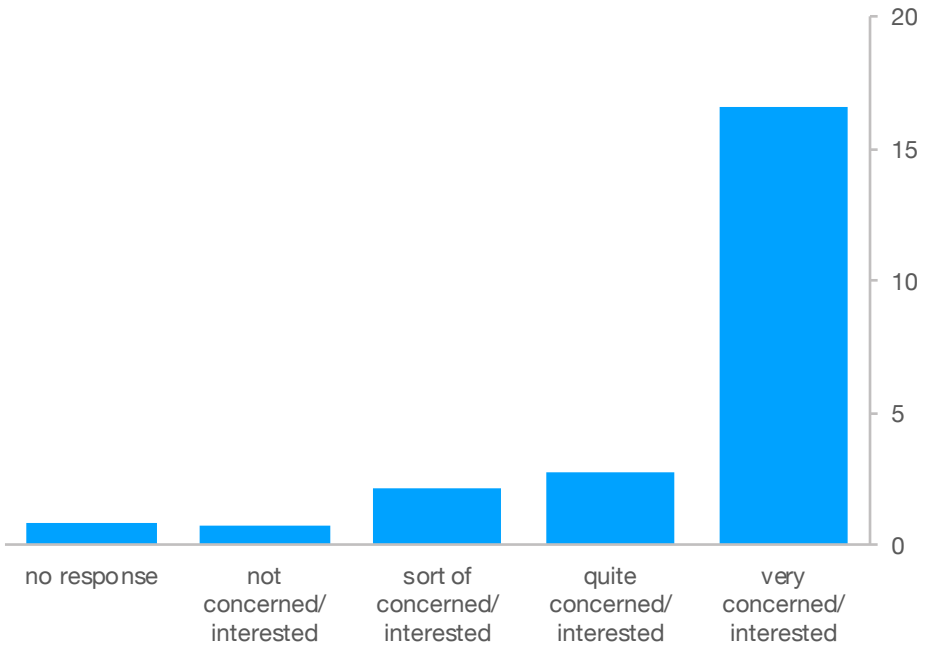
Table 3: Survey Results

question	*no response*	*not concerned/ interested*	*sort of concerned/ interested*	*quite concerned/ interested*	*very concerned/ interested*
The landfill (dump) is not managed. Is the current state of the dump a concern to you?	1	1	3	3	15
Is the way we manage waste and recycling in the community now of concern to you?	1	0	3	2	17
Does it concern you that the only thing we do with waste is put it in the dump?	1	2	2	1	17
Would you like to see a system for recycling established in our community?	1	0	1	5	16
If a recycling system was established, would you bring things to a recycle depot?	1	0	3	3	16
If a recycling system was established, would you like to have household pick up?	0	0	1	5	17
Would you be interested work sorting recycling material kind of employment?	1	2	2	0	18

comments:
- I had thoughts about this issue long ago. Nice to see that there is concerns about it now. I totally agree on seeing something set up to do so.
- I will work recycling for the community. Cut wood too.
- We need this in our community.
- I would work and do whatever to recycle.
- Recycling would be very nice to have in our community. Clean up our community.

The results of the survey show a consistent, high level of interest and concern.

Figure 33: Averaged Responses to Survey Questions



Of course, an expression of concern or interest is only that—an expression. To determine the actual level of concern and interest, it's necessary to offer an opportunity for action, and see who takes up the offer. That is exactly what the next section of this project is designed to do.

2.2.3. RECRUITING A CLEANUP CREW

Work on the ground began with recruiting a Cleanup Crew.

Community members were invited to sign up to join a Cleanup Crew. The Crew was hired on a casual basis—which meant that a person could work a half day, a full day, or a series of days, as they chose. Any community member currently on Income Assistance was eligible to join the Crew.

Initially, on the recommendation of Band Council and Administration members, Raymond Thorassie was recruited as Crew Lead. This arrangement did not work out. On the recommendation of Band Council and Administration members, Lenard Thorassie was hired as Crew Lead instead. This arrangement worked very well.

About half a dozen people responded to the initial invitation. Others joined the Crew in the following days, while some of the initial respondents only worked for a short period.

All were trained on the basics of safe work and separating recyclables.

2.2.4. STARTING TO CLEAN UP THE COMMUNITY

The Cleanup Crew began by working their way systematically through the community, cleaning up litter and other small waste items.

Figure 34: The Sayisi Dene Clean-Up Crew Begins Work

The Crew worked under difficult conditions. The weather was unusually hot, and mosquitoes, “horse” flies, and small biting “sand” flies were out in force.

Over time, more than a dozen people became part of the Crew. Because the work was casual, not everyone worked every day. As hoped, a core of dedicated Crew members emerged and took on leadership of the Project.

Table 4: Project Work Record

		Week						Total Hours Worked
		1	*2*	*3*	*4*	*5*	*6*	
Crew Leads	Raymond Thorassie	8	8					*16*
	Lenard Thorassie			23	35	47	45	*150*
Crew Members	Gerald Anderson	7	6					*13*
	Matthew Cutlip-Spence	4	6	15	14	2		*41*
	Arthur Duck	6	2		10			*18*
	Paul Ellis	6	5					*11*
	Derek Hendrick	6	8					*14*
	Shawn Hendrick	4	6	15	25			*50*
	Tommy Solomon	8	8	23	43	47	44	*173*
	Beth Thorassie	2		19	28	11	16	*76*
	Peter Yassie	4	2					*6*
	Rochelle Thorassie		2	23	37			*62*
	James Tom			20	39	35	17	*111*
	Justin Petrie			6	0	24	31	*61*
	Sheldon Thorassie			4	12			*16*
	Elaine Yassie			2				*2*
	Simon Cutlip				17		4	*21*
	Effie Thorassie				8	6		*14*
	Markus Moose				8	6		*14*
	Isaac Merasty					13	42	*55*
	Alicia St. Pierre					16	44	*60*
	total hours worked:	*55*	*53*	*150*	*276*	*207*	*243*	**984**

In addition to picking up litter and separating it into recyclables and non-recyclables, the Crew collected discarded objects throughout the community (always taking care to check that they were, in fact, discarded) and took them out to the WMF and separated them out.

Figure 35: Example of Collected Materials (1)

Figure 36: Example of Collected Materials (2)

As worked progressed, community members—and visitors to the community—noticed and commented how much better the community looked.

Figure 37: Community After Cleanup (1)

Figure 38: Community After Cleanup (2)

Figure 39: Community After Cleanup (3)

During this period, the Cleanup Crew chose a name for themselves and their initiative—"Sayisi Recycles".

They also agreed on a logo.

Figure 40: Sayisi Recycles Logo

It is worth emphasizing that the purpose of this cleanup wasn't to "solve the litter problem once and for all". Clearly, that will require a longer-term, sustained effort. This project component had three purposes:

1. To move from a situation where litter and waste in the community is seen as "a fact of life on reserve" to one where it is seen as a choice.
2. To develop a group of people within the community, who had put in the hard work of cleaning, who could become leaders and advocates for recycling and waste management in the community.
3. To make the work of that group visible to the wider community.

2.2.5. SEARCHING FOR AN IN-COMMUNITY RECYCLING DEPOT

A significant portion of the Crew's time was spent hunting for a suitable building to use as a recycling depot within the community.

The purpose of an in-community recycling depot is not to store recyclables or even as the location of most of sorting activities. Instead, it is needed as a hub where:

- Community members can:
  - bring their recyclables
  - get materials and information on recycling
- Spring drives can be coordinated

- Materials suitable for reuse can be given away
- Management of the Sayisi Dene Cleanup Crew—and any additional summer staff can occur
- Crew members can be trained

Every unused building in the central area of the community was examined. The most promising one was the former Youth Drop-In building.

Figure 41: Former Youth Drop-In Building

Unfortunately, this building has been condemned by Health Canada due to the extensive moisture and mould in its crawl space.

The former water treatment plant down by the beach also appears to be a good option.

Figure 42: Former Water Treatment Plant

Unfortunately, after considerable time, effort and discussion, no suitable, useable building was secured during this Project.

If a suitable building cannot be found in the next phase of this initiative—or a portion of a building set aside for this use—one will almost certainly need to be built. This would be unfortunate, as the cost of a building could be better spent on programming and staff.

2.2.6. SETTING UP BEACH FIRE RINGS

As noted above, the Cleanup Crew assembled clean wood that could not be reused for any other purpose at the beach swimming area.

Figure 43: Assembling Wood for Beach Fire Rings

They then built two beach fire rings for the community to use.

Figure 44: The Cleanup Crew Beside One of the Beach Fire Rings

Like the other components of the project, this had multiple purposes:

1. Increasing the fun of swimming and spending time at the beach
2. Cleaning up otherwise-unusable wood lying around the community
3. Raising awareness of work of the Cleanup Crew—and the value of recycling—among community members
4. Setting a precedent for a fire ring beside the frog pond, if it's used for skating in fall and winter

2.2.7. STARTING TO CLEAN UP AND SEPARATE RECYCLABLES AT THE WASTE MANAGEMENT FACILITY

The Cleanup Crew made a start on cleaning up the area in and around the current Waste Management Facility (WMF).

They focused their efforts on:

- litter along the roadway leading to the current WMF
- litter on the entrance road of the WMF
- litter caught by the fencing
- waste materials on the berms and at the edges of the two cells

The Crew focused on hand-sorting materials into basic categories:

- *Wood, wood products, cardboard and paper*
    - Wood and wood products suitable for reuse (including shipping pallets) were collected and assembled in a recycling area behind the Public Works Garage.
    - Unpainted wood not suitable for reuse was assembled at the beach (see "Beach Fire Rings" below).
    - Wood products and wood not suitable either for reuse or burning at the Community Fire Pits was taken to the WMF and separated from the general waste, in anticipation of burning in the burn box.
    - A start was made on separating paper and cardboard from the general waste.
        - Most paper and cardboard can be suitable for composting (see below).
        - Soiled or contaminated paper and cardboard not suitable for composting can be burned by qualified personnel in a Burn Cage
- *Plastics, including drink bottles*
    - These were separated and bagged, in preparation for compaction (see below).
- *Small metals (including drink cans)*
    - These were bagged separately from the plastics, also in preparation for compaction (see below).
- *Unrecyclable material*
    - Some of the material gathered up was not recyclable ("disposable" diapers, for example). This material was bagged and separated.

Figure 45: Starting to Separate Recyclables from General Material at the WMF

Figure 46: A Separate Recyclables Collection of Paper & Cardboard

Figure 47: Part-Way Through Separating Recyclables from General Material at the WMF

About half-way through the process of separating the recyclables at the WMF—after about a week of work—one of the more discouraging incidents happened. Someone burnt all of the recyclables that had been collected.

It is unclear who did this, or what their motives were. It may simply be that a community member continued with the practise of uncontrolled burning, and the fire spread to the recyclable material that had been collected. However it happened, the Crew naturally saw this as a setback. It was discouraging and frustrating.

To their significant credit, the Crew regrouped and resumed their work, collecting, sorting and bagging even more recyclables than they had collected before the fire.

Figure 48: More Recyclables Separation at the WMF

Given the scale of the problem, the Crew obviously did not complete all of the cleaning up needed at the WMF before the current phase of this initiative ended. But they made an important start.

Work conditions at the WMF were more difficult than in the community cleanup. In addition to the heat, mosquitoes and flies, on most days, two to three bears were present at the WMF. The most worrying one was a cinnamon-coloured bear.

Figure 49: Cinnamon Bear at WMF

Unlike the black bears, this bear was not afraid of humans. The usual techniques used by community members to frighten off bears—loud noises, firing off a gun nearby—had no affect at all.

This bear wandered into the community at one point and was shot in the upper foreleg by a community member. This wound made the bear lame, but did not kill him/her.

Significant discussion occurred amongst Crew, Council and community members. A wildlife official was also consulted. Reluctantly, a decision was made to kill this bear.

Traditional practices were honoured in how the bear was killed, and how it was treated after death. (The challenges of bears at the WMF is considered below, under "Lessons Learned" and in the Plan (in the third section).

Figure 50: Entrance to WMF After Cleanup

Members of the community commented on how much better the area in and around the WMF looked.

2.2.8. CREATING A BURN CAGE

In the next phase of this initiative, much of the "waste" paper and cardboard can be used to make soil for raised-bed gardens—both by mulching it directly and by mixing it with organics for processing through the In-Vessel Composter. However, some of it—primarily because it is mildly contaminated in some way, will need to be burned.

There will also be some wood products which cannot be reused, nor burned in the Community Fire Circles.

These materials will need to be burned. The only safe way to do this is in a Burn Cage.

Figure 51: Burn Cage

Photo source: Alaska Department of Environmental Conservation[12]

The most important benefit of a Burn Cage it to ensure that embers do not float away and cause forest fires. A Burn Cage will also prevent the fire from spreading to the rest of the WMF.

There are sufficient materials in the Derelict Equipment Area (discussed earlier) to create a good Burn Cage. This will need to be a priority in the next phase of this initiative.

For the short term, the Recycling Crew and O&M staff worked together to move a derelict concrete sewer manhole into the WMF.

[12] Photo published in: Department of Environment, Government of Nunavut. *Environmental Guideline for the Burning and Incineration of Solid Waste.* 2012 (revised). Page 10. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwiT9YTVwurcAhVKyYMKHblUAb4QFjAAegQIAhAC&url=https%3A%2F%2Fwww.gov.nu.ca%2Fsites%2Fdefault%2Ffiles%2Fguideline_-_burning_and_incineration_of_solid_waste_2012.pdf&usg=AOvVaw1tJ_HABtZyDEv4l4JjkPjr

Figure 52: Concrete Manhole Useable for Contained Burning

Once metal grating has been found and added to this manhole, it can serve as burn box, until the Burn Cage can be constructed. While not perfect, using this manhole for contained burning is a significant step forward from the past practise of open, uncontrolled burning.

2.2.9. STARTING TO CREATE WMF SIGNAGE

One of the crucial steps in bringing the WMF into proper management is separating materials. In addition to training WMF and Recycling staff on separating, we need to provide O&M staff, Northern Store staff and general community members with clear signage on where materials should be left.

Rather than waiting for formal, commercially-made signage—which would not be deployed until the next phase of this initiative—Crew members began by creating their own signs from materials they had on hand—salvaged plywood, paint from the Northern Store, and a marker.

Figure 53: Hand-Made WMF "Recycling" Signage (1)

Figure 54: Hand-Made WMF "Burnables" Signage (2)

Figure 55: Hand-Made WMF "Waste" Signage (3)

These signs need to be added to, and translated into Dene. Then, in the next stage of this project, durable (metal) signs with texts and images can be printed and deployed in the WMF.

The Crew created these signs in an improvised shop in Lenard Thorassie's (the Crew Lead) driveway. This shop was also used for the next stage of the project—creating community recycling bins.

2.2.10. BUILDING COMMUNITY COLLECTION BINS

Once the Crew had cleaned up the community and made a significant difference in the WMF, the next challenge was to begin to extend recycling activities into the community.

Using only salvaged materials and materials left over after previous years' construction projects, they worked together to design and build four Community Collection Bins—two large and two small.

Figure 56: Discussing Bin Design

These bins are designed to serve multiple purposes:

1. Provide a convenient alternative to littering
2. Be a visible reminder of the change in how the community handles its waste
3. Serve as a collection point for both recyclables and non-recyclables

Figure 57: Completed Large Community Collection Bin, with Crew

As important as having sturdy exteriors to the bins is, the interiors also needed to be figured out. If they were simply left as shown above, community members would throw materials into them and then the Crew—or others—would need to clear out their interiors.

A much better solution would be to have bags inside that would collect the materials as they are dropped in. After looking at a number of options—including plastic garbage cans and old oil barrels, the Crew found some large fibreglass tubes in the Derelict Equipment Area, cut them to size, and put them inside the large bins. Collection bags were then fitted snugly over the top of the tubes.

Figure 58: Fiberglass Tube in Large Community Collection Bin, without Bag

Figure 59: Fiberglass Tube in Large Community Collection Bin, with Collection Bag

Although the Crew hand-lettered the Bins to indicate what should be put in each slot, as with the WMF signage, these will need to be translated into Dene, and permanent, high-visibility signs will need to be created and installed.

Figure 60: Deployed Large Community Collection Bin

One small item worth noting on this Bin is the handle. It was salvaged by the Crew from one of the trucks in the Derelict Equipment Area—making both a stylish and functional addition to the Bin. A number of other vehicle handles were salvaged at the same time, to be used in other Community Collection Bins.

The small Bins needed a different solution for holding bags inside them; they were too small to hold a fiberglass tube. The solution arrived at—a binder clip in each of the four corners—holds the bag securely, but couldn't be made from local, recycled materials. These had to be bought at an office supply store down south and sent up.

Figure 61: Small Collection Bin - Interior

Figure 62: Small Collection Bin – Deployed

Designing and building these Bins together was an important team-building process for the Crew. Perhaps even more important, it marked a small but significant turning point for the Crew—from being employees in a recycling initiative, to beginning to design a recycling system for their community.

In future stages of this initiative, particularly if the Crew has access to a basic woodworking shop, these Bins could be made out of locally-available trees harvested from nearby burn areas.

Alternatively, the closest available equivalent to the larger bins are probably bear-resistant recycling bins. These would clearly be useful in this community, but they are expensive and would have to be sent up on the winter road.

Figure 63: BearSaver™ Recycling Enclosure

These may be the preferred long-term option for Community Collection Bins rather than those made by the Crew. This decision will depend, in part, on discussions with Multi Materials Stewardship Manitoba regarding funding to purchase Bins. Even more, it will depend on the community's preferences.

2.3. Mentoring Process & Management

This Project developed a mentoring process and management that was designed build a waste and recycling system that could be self-sustaining, and would not present a further management burden on Band Administration staff. Band Administration is already overburdened and understaffed; adding another management responsibility would not be sustainable.

Instead, Boke Consulting staff, working with the Crew Lead (Lenard Thorassie) developed a reporting process that included:

- A one-page Crew Member Agreement that was filled out for every new person hired.
    - This was photographed and emailed to Boke's General Manager, Kate Poole. A paper copy was kept by the Crew Lead in a binder.
- A one-page daily Work Record
    - This was also photographed and emailed by the Crew Lead to Boke's General Manager. A paper copy of this was also kept by the Crew Lead in the binder.
- A cash disbursement form
- A short emailed daily update from the Crew Lead to Boke's President, Bruce Duggan, who served as Mentor for the Crew Lead and Crew.
- Daily photographs of work done
    - Also sent by email, to both the General Manager and the Mentor.
- Multiple visits to the community by the Mentor
    - Each of these visits was short (3 to 4 days). They were designed to focus efforts and enable the Crew to plan upcoming activities, without making them dependent on the Mentor for ongoing, in-person supervision.
- Frequent phone calls and emails between Boke's General Manager, Kate Poole, Bruce Duggan, the Crew Lead, and Crew Members

This system was designed to:

1. Function even if the Crew Lead does not have access to a computer, printer or scanner.
2. Secure daily records suitable for review and reporting.
3. Document work done—and progress made—accurately.
4. Enable timely and accurate weekly payments to all Crew Members based on actual hours worked.

5. Set the groundwork for the ongoing functioning of a Waste & Recycling Crew.
    - The intention was to allow for options for future administrative arrangement. Those arrangements could include:
        - A department within the Band Administration structure
        - A social enterprise operating on behalf of the community
        - A department of a larger economic development corporation

2.4. Project Expenditures

Table 5: Project Expenditures

Cost Breakdown	budget		actual	
Professional and technical services				
project lead	$5,000		$5,000	
consultation on legacy waste site monitoring & remediation	$3,000			
consultation on recycling initiatives	$2,500			
consultation on waste project planning	$2,500			
consultaton on community engagement	$6,000		$6,000	
Professional and technical services subtotal:		*$19,000*		*$11,000*
Meetings				
1 community meeting @ $700 /meeting	$700		$725	
3 community team meetings @ $300 /meeting	$900			
Meetings subtotal:		*$1,600*		*$725*
Communications				
teleconferencing	*$500*		$269	
Cmmunications subtotal:		*$500*		*$269*
Training delivery and trainee costs				
4 trainees for 40 hours each @ $15/hour	$2,400			
4 trainees 10 lunches each @ $18/lunch	*$720*			
Training delivery and trainee costs subtotal:		*$3,120*		*$0*
Work experience initiatives				
2 work experience participants for 30 days each @ $130/day	*$7,800*		$15,252	
Work experience initiatives subtotal:		*$7,800*		*$15,252*
Salaries and wages				
1 employee for 30 days @ $150/day	*$4,500*		$7,719	
Salaries and wages subtotal:		*$4,500*		*$7,719*
Travel				
6 round trips @ $2400 /round trip	$14,400		$7,957	
Travel subtotal:		*$14,400*		*$7,957*
Overhead				
10% of non-equipment expenses	$5,386		$5,386	
Overhead subtotal:		*$5,386*		*$5,386*
Minor machinery and equipment				
Equipment & supplies	*$0*		$4,371	
Shipping	*$0*		$821	
Training delivery and trainee costs subtotal:		*$0*		*$5,192*
Other				
Accommodation	$1,440		$2,610	
Food	$1,000		$685	
Materials printing	$500			
Vehicle rental			$5,344	
Banking costs	$0		$122	
Other subtotal:		*$2,940*		*$8,761*
totals:		***$59,246***		***$62,261***
difference:				*-$3,015*

Money was shifted around as the Project developed, allocating more funds to hands-on training and work experience, shifting it away from some of the consulting expenditures and consultant travel.

Detailed receipts have been sent to the Band and the co-manager that specify and document these expenditures.

2.5. Lessons Learned from this Project

Numerous lessons have been learned from this Project, all of which can be usefully carried forward into future initiatives.

- There are sufficient people willing and able to work on waste and recycling in the community
    - With a moderate amount of administrative support and mentoring, community members have the skills and motivation needed to run a sustainable waste and recycling initiative
- Community pride can be a motivator in improving waste and recycling practices
    - Generally, members of Sayisi Dene do not need to be convinced of the benefits of recycling and better waste management. Instead, what is needed is funding and programming to put the community's priorities into practise.
- It will take time to change the social norms regarding littering
    - While a significant portion of the community is committed to taking care of their environment, littering can be a significant community problem even if only a few people do it.
- Chief, Council and Band Administration are needed to emphasize the priority placed on sustainable waste and recycling initiatives
- The willing participation of Band Operations & Maintenance staff is essential
- Training in waste facility operation and management is essential waste and recycling staff
    - Bear Smart training is equally essential for these staff
- A Work Opportunities Program for Income Assistance recipients can play a significant role in supplementing staffing resources
- Significant amounts of summer student time can be used for waste and recycling operations in future years
- Potential waste and recycling employees need bank accounts
- Integration with the school curriculum is needed
- Practical demonstrations of recycling, reuse and upcycling are more convincing than discussions
- Significant amounts of discarded material currently in the community can be usefully recycled for waste and recycling activities in the future
- Anything brought into the community must either be:
    - recycled & reused
    - turned into soil through composting, or
    - shipped back out

- Shipping material out on the winter road will be expensive
    - When possible, material should be recycled within the community.
- Bringing in recycling materials—bins, barrels, boxes, bags, etc.—while necessary, should be kept to a minimum
    - A plastic garbage bin, for instance, is often not designed for the extreme cold conditions of a Tadoule Lake winter. Even if it is, it eventually becomes garbage itself and must be shipped out again as waste.
- Large pieces of equipment—like a compacting garbage truck or an automated sorting system—are not appropriate or needed in this situation. This type of equipment is:
    - expensive to purchase and ship
    - challenging and expensive to maintain and repair, particularly in a small, remote community
    - designed for communities considerably larger than Sayisi Dene
- The only large piece of equipment needed—a bulldozer for the WMF—is already available in the community
    - The challenges are:
        - to ensure that it is operational
        - to have the willing cooperation of O&M staff
- Organics need to be composted
- Waste & Recycling initiatives need to be integrated with other initiatives, including Derelict Vehicle Decommissioning
- "Disposable" diapers will remain a significant problem, at least until a diaper service is established
    - Of all the items encountered during the cleanup of the WMF, these were the most difficult to deal with. They don't decay and cannot be recycled.

These lessons have been integrated into the Waste & Recycling Operations Plan, which follows in the next section of this Report.

3. WASTE & RECYCLING OPERATIONS PLAN

3.1. Plan Purpose

This Plan is intended to establish a sustainable waste and recycling program for the Sayisi Dene community located at Tadoule Lake.

This Plan is designed to fulfill the vision and priorities of the Sayisi Dene Comprehensive Community Plan (discussed in the first section of this Report) particularly those included under the "Lands & Resources" focus.

The Plan in this document includes an outline of the proposed approach, a listing of materials, equipment and people needed, a proposed timeline, and capital and operational cost estimates.

3.2. Research & Discussions

In addition to the hands-on work that occurred in this project—detailed in the previous section—a considerable about of research discussion occurred behind the scenes. These discussions occurred with community members, Council members, Crew members and Boke consultants. All were focused on the best approach for sustainable waste and recycling management in Sayisi Dene.

Many questions and options were considered during the development of this Plan, including:

- What is the most appropriate waste & recycling equipment for use in the Sayisi Dene community?
- Where should the majority of the recycling sorting occur—in the community, at the WMF, or in some other location?
- What materials should be shipped out and what should be kept in the community?
- How can we best involve all parts of the Sayisi Dene community in sustainable waste and recycling management?
- What role should Producer Responsibility Organizations—including Multi Materials Stewardship Manitoba—play in enabling Sayisi Dene to operate a sustainable waste and recycling program?

Boke consultants—and some members of the Sayisi Dene community—visited a variety of waste and recycling facilities and brought the lessons learned from them into these discussions. These included visits to Thompson facilities, Brandon waste and recycling facilities, the Altona recycling program, and the Louise integrated waste and recycling facility in Pilot Mound.

As well, considerable research was done on waste and recycling initiatives in northern Canada and other remote communities.

All of this was considered in developing this Plan.

3.3. Plan Summary

1. Engaging the community
2. Reducing and reusing
3. Staffing and governance
4. Managing external agreements & relationships
5. Creating recycling & waste boxes and stations
6. Bringing the Waste Management Facility (WMF) into compliance
7. Implementing comprehensive collection & management system
8. Cleaning up waste backlog
9. Monitoring current and legacy waste sites

Table 6: Summary Timeline

		Year			
	area of focus	*1*[13]	*2*	*3*	*4*[14]
1	*Engaging the community*	review & discuss Plan	review & improve Plan annually		
2	*Reducing and reusing*	develop school curriculum	work with Northern Store to reduce packaging	open swap "store"	review & improve
3	*Staffing and governance*	choose staff; begin operations; begin training	continue operations & training; supplement staff with WOP participants & summer students; develop mandate & governance		
4	*Managing external agreements*	secure agreements	prepare & ship materials; review agreements annually		
5	*Creating recycling & waste boxes and stations*	set up Recycling Depot & Transfer Station	build & distribute household boxes	repair & replace community & household boxes, as needed	
6	*Bringing WMF into compliance*	Burn Cage; sub-cells	build fence & sub-cell separators	sub-cell capping	review operations with governments
7	*Implementing comprehensive collection & waste management system*	choose, purchase and ship equipment & supplies	begin in-vessel composting; begin using recycling shuttle	repair or take apart derelict buildings	review waste & recycling collection & management
8	*Cleaning up waste backlog*	set up vehicle decommissioning	vehicle, equipment and appliance decommissioning, staging and shipping		

[13] Year 1 covers September 2018 to March 2019.

[14] Year 4 is template for subsequent years.

9	*Monitoring current and legacy waste sites*	choose monitoring company	take & send samples for analysis annually

3.4. Plan Details

Table 7: Detailed Timelines[15]

Year 1			
area of focus		*Fall*	*Winter*
1	*Engaging the community*	review Plan with Chief & Council	distribute & discuss Plan with community
2	*Reducing and reusing*	begin discussion with school staff	develop school curriculum
3	*Staffing and governance*	choose and hire staff; waste oil burner operator training; vehicle decommissioning training;	safety training; SWANA operator training
4	*Managing external agreements*	secure agreement with Thompson & scrap metal companies	begin discussions with PROs
5	*Creating Recycling & Waste Bins, Boxes & Stations*	choose Recycling Depot; assemble trailers for Transfer Station	set up Recycling Depot for use; adapt trailers for use as Transfer Station
6	*Bringing WMF into compliance*	build & use Burn Cage	create sub-cells
7	*Implementing comprehensive collection & waste management system*	choose equipment & supplies	ship equipment & supplies on winter road
8	*Cleaning up waste backlog*	set up Vehicle Decommissioning Station	set up oil burner
9	*Monitoring current and legacy waste sites*	get quotes on monitoring costs	choose monitoring company

[15] For the purposes of this timeline: Fall = Sep to Dec, Winter = Jan to Mar, Spring = Apr to Jun, Summer = Jul & Aug.

Year 2				
area of focus	*Spring*	*Summer*	*Fall*	*Winter*
1 *Engaging the community*		solicit suggestions for improvement from community	review Plan with community	improve Plan
2 *Reducing and reusing*	Implement school curriculum	work with Northern Store & shippers to reduce packaging		
3 *Staffing and governance*	BearSmart training	recruit & manage summer students; develop WOP program	decide mandate; recruit & manage WOP staff	decide governance structure; SWANA manager training
4 *Managing external agreements*	conclude discussions with PROs	prepare shipments to Thompson & PROs		ship to Thompson & PROs
5 *Creating Recycling & Waste Bins, Boxes & Stations*	set up Construction Shop; build Platform & Ramp for Transfer Station	build Household Collection Boxes	distribute Household Collection Boxes	
6 *Bringing WMF into compliance*	assemble materials for fence & sub-cell separators	build fence & sub-cell separators; set up permanent signa		separate materials currently in WMF
7 *Implementing comprehensive collection & waste management system*	train operators on equipment	begin using in-vessel composter	begin using recycling shuttle	offer organics recycling collection for households
8 *Cleaning up waste backlog*	begin using waste oil burner	begin vehicle decommission-ing	assemble derelict appliances for shipping	ship vehicles & appliances
9 *Monitoring current and legacy waste sites*	begin monitoring		send samples for testing	

Year 3				
area of focus	*Spring*	*Summer*	*Fall*	*Winter*
1 *Engaging the community*		solicit suggestions for improvement from community	review Plan with community	improve Plan
2 *Reducing and reusing*	review school curriculum	open swap "store"	make improvements to school curriculum, as needed	
3 *Staffing and governance*	hazardous waste training; management & governance training	recruit & manage summer students; develop WOP program	recruit & manage WOP staff	Part-time staff to take Landfill Operations training; review staffing & training
4 *Managing external agreements*	review first year of shipping	make changes as needed	prepare shipments to Thompson, PROs & scrap metal companies	ship to Thompson, PROs & scrap metal companies
5 *Creating Recycling & Waste Bins, Boxes & Stations*	Inventory Community Collection Bins & Household Collection Boxes	repair & replace Community Collection Bins & Household Collection Boxes, as needed		consider improvements to Recycling Depot & Transfer Station
6 *Bringing WMF into compliance*	Develop sub-cell capping plan	review WMF with Govt of MB & Govt of Canada	make any needed improvements	ship up supplies as needed
7 *Implementing comprehensive collection & waste management system*	conduct inventory of all derelict buildings	repair or take apart derelict buildings		offer salvaged material to community members
8 *Cleaning up waste backlog*	continue vehicle & equipment decommissioning		stage derelict vehicles & equipment for shipping	ship vehicles & equipment
9 *Monitoring current and legacy waste sites*			send samples for testing	

Year 4 & Subsequent Years				
area of focus	*Spring*	*Summer*	*Fall*	*Winter*
1 Engaging the community		solicit suggestions for improvement from community	review Plan with community	improve Plan
2 Reducing and reusing	review school curriculum	continue swap "store"	make improvements to school curriculum, as needed	
3 Staffing and governance	determine if additional training needed	recruit & manage summer students; develop WOP program	conduct management & governance review; recruit & manage WOP staff	Implement additional training, if needed
4 Managing external agreements	review first year of shipping	make changes as needed	prepare shipments to Thompson, PROs & scrap metal companies	ship to Thompson, PROs & scrap metal companies
5 Creating Recycling & Waste Bins, Boxes & Stations	Inventory Community Collection Bins & Household Collection Boxes	repair & replace Community Collection Bins & Household Collection Boxes, as needed		consider improvements to Recycling Depot & Transfer Station
6 Bringing WMF into compliance	Implement call capping plan	conduct annual operations review	make changes as needed	ship up supplies as needed
7 Implementing comprehensive collection & waste management system	review waste & recycling collection & management	make changes as needed		
8 Cleaning up waste backlog	continue vehicle & equipment decommissioning – backlog to be cleared by year 4		stage derelict vehicles & equipment for shipping	ship vehicles & equipment
9 Monitoring current and legacy waste sites			send samples for testing	

3.4.1. ENGAGING THE COMMUNITY

The success of this program will largely depend upon how much support it receives from the community. Community support for sustainable waste management and recycling will build if:

- leadership make their commitment clear
- the Plan creates local jobs

- awareness is raised
- community members are offered opportunities for involvement, and
- the wider community is involved in ongoing decision making

3.4.1.1. Commitment of Leadership

Chief and Council made a decision to initiate this current Project. This commitment will need to be renewed at the beginning of the next phase of this initiative.

It needs to be clear to all Band staff—and to the wider community—that the way waste has been dealt with in the past cannot continue, and sustainable waste management and recycling is a priority.

3.4.1.2. Creating Local Jobs

Implementing this Plan will increase local employment. (For details, see Staffing and Governance, below.)

3.4.1.3. Awareness

We can't assume that community members will know what is happening in waste and recycling on their own. The staff and leadership of the waste and recycling initiative must work systematically to build awareness of what is happening, and explicitly show how activities embody the values of the community, and contribute to the community's quality life. Some elements of the Plan that will help build awareness are:

- A Recycling Depot in the centre of the community, with cleanup and recycling initiatives run out of the Depot
- Recycling bins in public places
- Visible examples of recycling and reuse of waste materials
- Events and activities advertised through posters in the community and Public Service Announcements (PSAs) on social media

3.4.1.4. Opportunities for Involvement

Getting people actively involved will help to build a sense of ownership and connection to the Plan. A primary way to get people involved will be through community events like Spring Cleanups and Recycling Drives to collect specific recyclables and derelict appliances.

3.4.1.5. Community Involvement in Decision Making

The Plan needs to be reviewed annually by the community, with suggestions for improvement asked for, and acted on.

Waste & Recycling Staff need to take the lead on this activity, with support from Band staff, and Chief and Council.

One of the first community decisions that needs to be made is a decision whether or not to have the Northern Store charge a 5¢ or 10¢ deposit on drink cans and bottles. This money would be given to the Waste & Recycling initiative, and then given back to anyone bringing in a drink can or bottle to the Recycling Depot or Transfer Station.

3.4.2. REDUCING & REUSING

Reducing the amount of waste produced—and reusing materials that might otherwise be considered waste—will require sustained effort.

3.4.2.1. Education

The ongoing involvement of the school will be essential to the success of this Plan.

The Green Action Centre's "Community Pathfinder First Nations Waste Minimization Project" may also be able provide support education activities.

3.4.2.2. Waste Reduction

Diverting recyclables and organics away from the landfill is a good thing to do - but what about taking steps to reduce the sources of waste? After the commencement of the implementation aspect of this project, we will continue to investigate and discuss initiatives to reduce waste. Here are some examples to consider:

- Working with the Northern Store to:
  - Replace styrofoam and plastic food containers with compostable alternatives
  - Sell perishable food in smaller portions (reducing the amount of food that spoils and is thrown away)
- Enabling community members to use reusable, non-plastic shopping bags
- Promoting and making available rechargeable sparkling water makers[17] (using refillable bottles), instead of pop and sugary drinks (in nonrecyclable bottles and cans)
- Making rechargeable batteries available
- Making LED bulbs more available

3.4.2.3. Swap Days

At least once a year the Waste & Recycling staff should hold up opportunities at the Recycling Depot for community members to get reusable materials—either by swapping or by choosing from available reclaimed items. These can range from baby clothes to vehicle parts scavenged from the Derelict Equipment Area, to surplus building materials left over after construction projects.

3.4.3. STAFFING AND GOVERNANCE

3.4.3.1. Staffing

A sustainable waste & recycling system for Sayisi Dene will require:

- Three permanent, full-time jobs, one focused primarily on recycling, one on waste, and one acting as an assistant to the other two, as well as filling in for them when they are on holidays, out of community, or otherwise unable to work on waste & recycling.
    - Currently, there is one O&M staff person focused primarily on waste, so this would mean a net increase of two permanent, full-time jobs.
- Seasonal, part-time and casual staff to:
    - Build Household Collection Boxes and Community Collection Boxes
    - Build structures like the Transfer Station
    - Prepare the Recycling Depot for public use
    - Construct WMF fencing
    - Work on Spring Community Cleanups, Summer WMF Cleanups, and Recycling Drives
    - In the first two years, as the Transfer Station, Bins and Fencing are being created, this would create approximately 4 person-years of employment each year.
    - In the following year, as the required upgrading is completed and the backlog of waste & recyclables are cleared, approximately 2 person-years of employment can be expected to be created.
    - Crews for each initiative should be set at 5 of 6 people per project, in addition to the permanent staff.
        - The experience of the Cleanup Crew in the Project (reported on above) indicates that Crews that are much smaller or much larger than this tend not to be as effective.

Training is needed for the Waste & Recycling staff—particularly the three permanent staff members. Initially, they need:

- Waste oil burner operator training
- Vehicle decommissioning training
- Safety training
- To take and pass the SWANA Certification as a Landfill Operator

In the second year, they need to:

- Take BearSmart training.
- Become certified through SWANA as Managers of Landfill Operations.

In the following years:

- Part-time staff will need to become certified as Landfill Operators
- Permanent staff will need:
    - Hazardous waste training
    - Management and governance training

3.4.3.2. Governance

As noted earlier, this initiative could have one of at least three governance structures:

- A department within the Band Administration structure (parallel to the Operations & Maintenance department)
    - It could also be operated as a sub-department of another department, perhaps of the O&M department.
- A social enterprise (co-op, non-profit, or for-profit) that could run waste and recycling activities on behalf of the community
- A department of a larger enterprise focused on community economic development

Depending on the governance structure chosen, resources that would be valuable in providing governance training are:

- Aki Energy
- The Centre for Indigenous Environmental Resources (CIER)

Some decisions will be dependent on the structure chosen:

- If the option of a social enterprise is chosen:
    - Should it be a co-op, a non-profit, or a for-profit?
    - Who should draw up the governing documents?
        - How are they amended
    - How are board members chosen?
        - Board members would be paid, at most, a small stipend for the hours worked.
        - There would be no need to spend money on Board travel.
    - How is the ownership by the community embodied in the organization's governing documents?
        - Does the Band hold the shares in trust for the community?
        - Does each community member own a share?
            - Do off-reserve Band members each own a share?
- If it is part of another department or economic development corporation:

    - How much involvement should the "parent" department or corporation have in operations? In management?

A number of other decisions will need to be made no matter what governance structure is chosen:

- How do Chief and Council exercise their governance responsibilities?
- How does the Band Administration exercise its administrative responsibilities?
- How do we ensure Waste & Recycling works well with other relevant departments and programs, including:
    - The school
    - O&M
    - Gardening and other food projects
- Where does any revenue from selling scrap metal, and any funding from the PROs go?
- How is community involvement managed?
- How are staff hired, evaluated, disciplined and, if necessary, let go?
- Who handles payroll?
- What is Waste & Recycling's mandate?
    - Does waste remain within the responsibility of O&M?
    - Would Waste & Recycling be responsible for mould testing and remediation? Radon testing & remediation?
    - Would Waste & Recycling be responsible for building demolition

3.4.4. MANAGING EXTERNAL AGREEMENTS

Much of the diversion of waste into recycling can be internal to the Sayisi Dene community (see Implementing A Comprehensive Collection and Waste Management System below). However, some materials will have to be trucked out of the community on the winter road:

- Appliances that may contain refrigerants will need to be taken to either the Thompson recycling facility, PureSphera in Winnipeg, or an equivalent location that can accept and safely decommission them.
- Metals—including derelict vehicles and equipment, and non-refrigerant appliances can be sold, either for parts or for scrap.
- Items that are the responsibility of PROs, if they cannot be handled within the community, will need to be prepared for shipping according to their requirements

Agreements will need to be created and managed with:

- Trucking companies bringing in materials on flatbeds, to backhaul large or crushed metals, vehicles and equipment
- Trucking companies bringing materials in semis, to backhaul recyclables in the Bulk Bags and in Sealable Bulk Containers
- Every Producer Responsibility Organization
- Manitoba Sustainable Development
- Suppliers of Materials

Within the Sayisi Dene community, agreements will need to be developed and managed with:

- The O&M department
- School Administration & Teachers
- Nursing Station Staff
- The Northern Store

3.4.4.1. Producer Responsibility Organizations (PROs)

There are numerous Producer Responsibility Organizations (PROs) in Manitoba. Each has a responsibility for and receives funding to manage specific product wastes.

Figure 64: Producer Responsibility Organizations (PROs) in Manitoba

Table 8: Recyclable Products & Associated PROs[16]

product	*PRO responsible*
beverage containers	Recycle Everywhere
car batteries	Canadian Battery Association (CBA)
cell phones	RecycleMyCell.ca
electronics (eWaste)	Electronic Products Recycling Association (EPRA)
household batteries	Call2recycle
Household Hazardous Waste (HHW)	ProductCare
household recyclables	Multi-Material Stewardship Manitoba (MMSM)
medications & pharmaceuticals	Medications Return Programs (MRP)
mercury switches	Thermostat Recovery Program (TRP)
Tires	Tire Stewardship Manitoba (TSM)
used oil & oil filters	Manitoba Association for Resource Recovery Corporation (MARRC)

Each of these PROs has been collecting fees for products sold in the community. However, currently, they do not use those funds to collect and dispose of these materials from Tadoule Lake.

Contact needs to be established with each of these PROs and secure their support in covering the costs of recycling their materials. This will offset some—but not all—of the costs of the Plan outlined here.

3.4.5. CREATING RECYCLING & WASTE BOXES AND STATIONS

3.4.5.1. Household Collection Boxes

As noted below, approximately 50 Household Collection Boxes will need to be constructed.

3.4.5.2. Community Collection Bins

As noted earlier, the Cleanup Crew built two large Community Collection Bins and two small ones.

Details of the Community Collection Bins that need to be built over the next few years are found below.

3.4.6. BRINGING THE WASTE MANAGEMENT FACILITY INTO COMPLIANCE

The basic actions that need to be taken to bring the WMF into compliance include:

- Construction and use of the Burn Cage
- Creation and use of Sub-Cells to separate waste and allow for ongoing capping of waste

[16] An additional PRO—CleanFarms—is responsible for agricultural chemical containers and is not currently relevant to SDFNs waste and recycling activities.

- Renewed fencing and gates
- Annual testing of monitoring wells
- Regular summer cleanup
- Weekly management
- Daily management
- Ongoing discussions with Manitoba Sustainable Development

3.4.6.1. Burn Cage

As noted above, a Burn Cage needs to be built and used. Equally important, it needs to be used in a safe, professional manner. Some of the key elements of the safe operation of a Burn Cage are:

- Nothing is burnt except in the Burn Cage
  - No open fires at or near the WMF
- No plastics, metals, organics, or hazardous wastes are put into the Burn Cage; only paper, cardboard, wood and wood products
  - Clean, shreddable paper should not be burnt.
    - It should be put through the shredder, stored in the Transfer Station and mixed in the In-Vessel Composter with organics to make soil for gardening. If needed to conserve space, the paper can be compacted in the Vertical Baler until needed.
  - Clean cardboard should not be burnt.
    - It should be used in gardening as the base of cold frames, raised beds and potato tire towers, as outlined in the Northern Foods Sovereignty Study.[17]
  - Clean wood should not be burnt in the Burn Cage.
    - If the wood can be reused for building, it should be stacked by the Transfer Station.
    - If the wood is clean but cannot be reused for building, it should be cut into lengths (approximately 16" to 18') and stacked by the Community Fire Circles. Because people may cook food over these fires, this wood cannot be pressure-treated, stained or painted.
  - Pressure-treated, stained and painted wood can be burnt in the Burn Cage, as can wood-based materials like OSB, plywood, and MDF.
  - No chemicals, paints, waste oil or oil-based products should be burnt.

[17] See http://bokeconsulting.com/northern-foods-sovereignty-study/

- The guidelines for the safe incineration of solid waste should be followed.[18]
- The Burn Cage needs to be closed before the fire is lit.
- One of the Waste & Recycling Staff needs to stay beside the fire, with a working fire extinguisher, until the fire has burned down to embers.
- The door of the Burn Cage needs to be left closed until the fire is completely out and the embers have cooled. Only then should it be opened and another load of burnables put in.

3.4.6.2. Sub-Cells

The WMF currently has two cells. These need to be further divided into smaller sub-cells.

These sub-cells can be used to separate out materials. They can also be covered up, one at a time, as the WMF fills up.

The map of the Rockwood Transfer Station in the appendices provide a good example of a WMF that is separated into different uses.

3.4.6.3. Fencing and Gates

The fence around the WMF is in disrepair and needs to be replaced. The new fence needs to:

- Be able to contain lighter materials that get blown by the wind
- Be bear-resistant
- Keep smaller animals out
- Be repairable with local materials and local labour

It should be constructed using local materials. A design meeting the above criteria might include local fire-kill logs for fence posts and crossmembers. There are examples of this kind of fencing in both the Tadoule Lake community and at Lac Brochet.

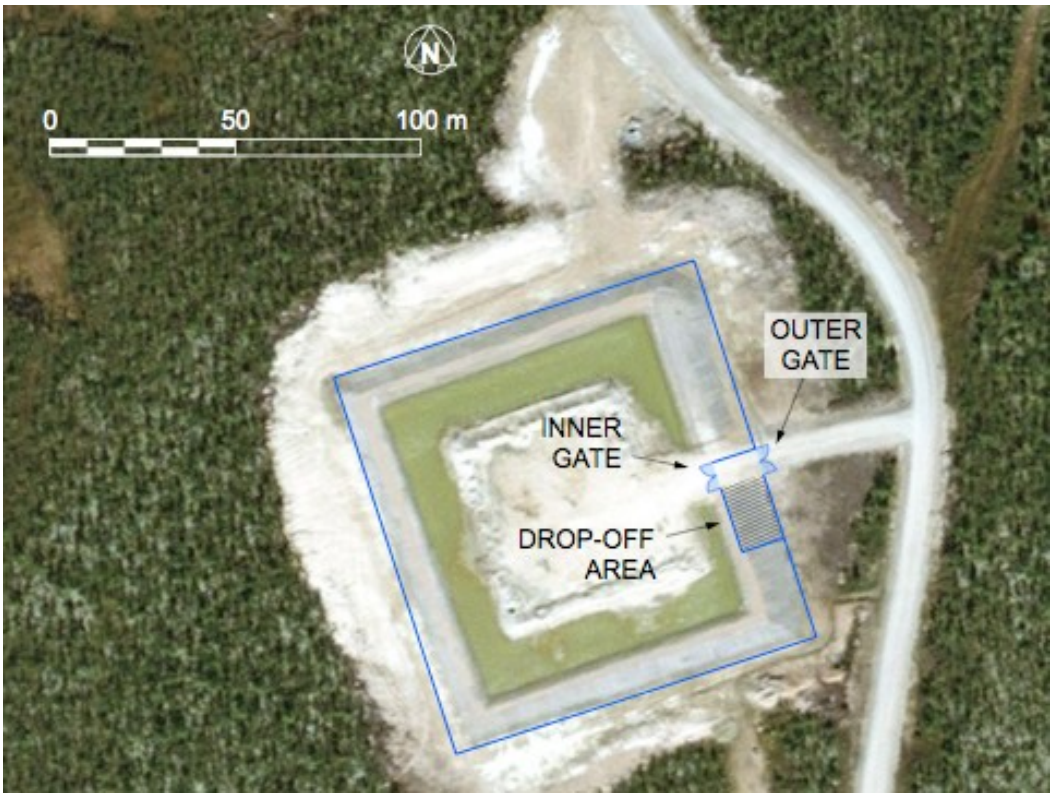
[18] Department of Environment, Government of Nunavut. *Environmental Guideline for the Burning and Incineration of Solid Waste.* 2012 (revised). This document should be followed to ensure the safe operation of the Burn Cage. However, because it was designed for communities even more remote than SDFN, it recommends burning of some materials that are not recommended for burning here. ***Only the materials listed for burning in this report should be burnt.***
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwiT9YTVwurcAhVKyYMKHblUAb4QFjAAegQIAhAC&url=https%3A%2F%2Fwww.gov.nu.ca%2Fsites%2Fdefault%2Ffiles%2Fguideline_-_burning_and_incineration_of_solid_waste_2012.pdf&usg=AOvVaw1tJ_HABtZyDEv4l4JjkPjr

Figure 65: Fencing Example from Lac Brochet

This design allows for the fence to be repaired without having to depend on replacement materials coming on the winter road.

Just as important as the fencing, two gates—an inner and an outer gate—with a drop-off area between them are needed for the WMF to be properly managed.

Figure 66: WMF with Renewed Fencing, Gate and Drop-Off Area



The outer gate can be open during "regular operating hours"—perhaps 9 to 5, Monday to Saturday. There is no need for a Waste & Recycling staff person to be in attendance.

The inner gate should only be open when access by the Waste & Recycling staff is needed.

The Drop-Off Area between—shown here as approximately 40' by 60' should have permanent signage showing community members where to drop of their separated materials. At minimum, signs should include:

- Paper, cardboard & wood
- Plastics
- Tires
- Organics
- Metals
- Everything else

If the other Waste & Recycling systems—Household Collection Boxes, Community Collection Bins, Cleanup and Recycling Drives, the Recycling Depot, and the Transfer Station—are all operating properly, there is no real need for community members to come to the WMF to drop off materials at all.

However, old habits die hard. Some community members will still want to bring materials to the WMF. The Drop-Off Area allows that to happen, will reduce the incentive to dump waste materials outside the gate, and begins the process of separating materials.

For the Drop-Off Area to function properly, Waste & Recycling staff will need to empty it daily, taking non-recyclables into the WMF itself, and recyclables to the Transfer Station.

3.4.6.4. Annual Testing of Monitoring Wells

As outlined below, in the section Monitoring Current and Legacy Waste Sites, annual testing of Monitoring Wells at the WMF is essential.

3.4.6.5. Summer WMF Cleanup

This Plan calls for employing summer students and casual staff to clean up the WMF every summer. Primarily, they will need to collect loose material around the sub-cells, along the fencing, and on the road and forest around the WMF.

This cleanup needs to include separating out material that can be diverted away from the WMF.

3.4.6.6. Weekly Management

Once a week, a member of the O&M staff needs to go to the WMF with a bulldozer, push the accumulated waste together, compress it by driving over it with the bulldozer, and then cover it up.

At least one of the Waste & Recycling staff will need to be there before this work to ensure that the accumulated waste contains only non-recyclables.

As well, the Burn Cage should be loaded and used at least once a week.

3.4.6.7. Daily Management

At least one of the Waste & Recycling staff will need to go to the WMF twice each workday--once in the morning to open the outer gate, and once in the evening to close it.

During one of those visits, they will need to move the material in the Drop-Off Area either into the WMF or to the Transfer Station, as appropriate.

3.4.6.8. Ongoing Discussions with Manitoba Sustainable Development

Becoming compliant—and staying compliant—will require ongoing discussions with Manitoba Sustainable Development. Initially, those discussions might be quite frequent. Once the WMF is being managed sustainably, those discussions will become simple and infrequent.

3.4.7. IMPLEMENTING A COMPREHENSIVE COLLECTION AND WASTE MANAGEMENT SYSTEM

In addition to bringing the Waste Management Facility into compliance, outlined above, a comprehensive collection and waste management system for SDFN includes:

- Purchasing, shipping, using, maintaining, and replenshing all Equipment and Materials listed below
- Training
- Weekly waste and recycling pickup
- Spring community cleanups
- Recycing drives
- Integrating the Derelict Vehicle Project into this Plan
- Recycling Organics

3.4.7.1. Needed Equipment and Materials

The needed Equipment and Materials—with a rationale for each—are outlined in the Requirements section, below.

3.4.7.2. Training

The needed training is listed in Staffing and Governance, above

3.4.7.3. Weekly Waste & Recycling Pickup

The three staff responsible for waste and recycling will, together, need to ensure that waste and recycling is picked up on a predictable, weekly schedule.

They will need to drop recyclable materials off at the Transfer Station, while non-recyclables will need to be taken out to the WMF.

3.4.7.4. Spring Community Cleanups

In the spring, a considerable amount of litter appears throughout the community when the snow melts.

Spring Cleanups need to be revitalized. In addition to hiring seasonal staff for this, volunteers, school staff and students, O&M staff, and Band leadership will all need to be involved.

Spring Cleanup should use the Recycling Depot in the community as its hub. The primary focus should be on:

- Cleaning up all litter
  - This would be a good opportunity to involve students in a raffle—perhaps giving a ticket for:
    - every 10 bottles, plastic containers, or cans
    - every pound of litter brought in
  - Care needs to be taken to ensure that community members involved in cleanup have the right safety equipment, including gloves, bags, and garbage pick-up "grabbers".
- Clearing away all larger waste and recyclable materials within the community, including derelict or unwanted:
    - Appliances
    - Furniture
    - Snowmobiles
    - Vehicles
    - Tires
    - Wood products (including pallets), metals, and plastics
  - Most of this can be removed to the Transfer Station or the WMF by the Waste & Recycling staff. Some (such as old vehicles) will need heavy equipment to move, and so will need the involvement of O&M staff.

The Canadian Beverage Container Recycling Association (CBCRA) has a program to work with 10 communities per year to assist them with spring cleanup events with their *Recycle Everywhere* people. We will apply to be one of those communities.

3.4.7.5. Recycling Drives

At selected points in the year, the Waste & Recycling staff, supplemented by additional seasonal, part-time and casual staff, will need to organize well-planned and well-publicized Recycling Drives.

On predetermined days, the Waste & Recycling Truck (for large items), and the Electric Runabout (for smaller items) will go around the community, each pulling their trailer, and collect specific recyclable materials. People will be invited to:

- Leave their recyclables out beside their Household Collection Boxes
- Bring their recyclables
  - out to the vehicles as they go by
  - to the Recycling Depot
  - to the Transfer Station

Materials that could be collected in such drives include:

- Electronic waste (eWaste) & household batteries
- Household Hazardous Waste (HHW)[19]
- Paper and cardboard
- Plastics
- Cans
- Tires

3.4.7.6. Integrating the Derelict Vehicle Project into this Plan

Although the Derelict Vehicle Project began as a separate initiative, to maximize the effectiveness of that initiative and this one, they need to be integrated.

The Derelict Vehicle Project is covered as part of the next section on cleaning up the waste metals backlog

3.4.7.7. Recycling Organics

Organics (also known as "organic material"), such as food waste, constitutes about 1/3 of the residential waste stream in most Canadian communities. Anything that can rot is organic material, including:

- Food thrown out by the store
- Scraps created when making meals
- Leftovers from meals
- Fish guts and other fish waste, including any fish caught that aren't eaten
- Anything left over from hunting or trapping
- Animal carcasses

If we divert organics away from landfills, we will achieve important environmental benefits:

- We will reduce methane gas emissions.
    - Methane is released when organic waste decomposes anaerobically (without oxygen). This happens when organic waste is deposited in a landfill. Methane has 25 times the global warming potential of carbon dioxide.

[19] Household Hazardous Wastes (HHWs) are not the same as industrial waste (like body-shop paints) or contaminated waste (like mould-affected building materials). HHWs are materials left over from normal household activities that should not be put into a landfill. See the appendix Household Hazardous Waste (HHW) Items for a detailed listing

- We will reduce or eliminate leachate
    - Leachate is the liquid produced by rotting materials. It contaminates the soil and groundwater, and can damage nearby streams and lakes.
- We will extend the life of the WMF
    - The less material that goes into the WMF, the more slowly it will fill up.
- We will make the WMF less attractive to bears, birds, and other wildlife
    - Until organics are diverted from the WMF, animals will remain a serious problem.
- We can grow food
    - When mixed with shredded paper, sawdust or wood chips and put into the In-Vessel Composter, it becomes compost, which can be mixed with sand and muskeg to make rich soil.

We will work with the Green Action Centre and the In-Vessel Composter manufacturer to provide training to Waste & Recycling staff, and to interested community Members.

3.4.8. CLEANING UP THE WASTE BACKLOG

3.4.8.1. Metals Waste Backlog

A related project—the Derelict Vehicle Project—has purchased the equipment necessary to clean up the metals waste backlog in Sayisi Dene.

The bulk of the metals waste backlog is located in the Derelict Equipment Area around the Public Works Garage. Of course, not all of the material in this area is metal, but a majority of it is.

All equipment needed to safely decommission vehicles—including a vehicle hoist, air tools, and waste fluid handling equipment—was purchased by the Derelict Vehicle Project. This equipment was delivered to the community in March 2018 on the winter road. ***It must be installed by the Waste and Operations department in the Public Works Garage no later than Fall 2018***.

As well, a crusher was purchased and is waiting in Thompson to go into the Sayisi Dene community on the winter road in February 2019. This crusher will circulate between the three northwest Manitoba First Nations of Sayisi Dene, Northlands Dënesųłiné (Lac Brochet), and Barren Lands First Nation (Brochet). ***If Sayisi Dene has the vehicle hoist and other equipment installed in its Public Works Garage this fall, they will be the first community to get the crusher.***

Every winter, the crusher will move on the winter road between these three communities. This means that vehicles can be crushed in Sayisi Dene every three years. However, vehicle decommissioning can occur throughout the year, every year, and derelict metals can—and should—be shipped out every year on the winter road:

- Many of the vehicles—and much of the other derelict metals—are too large to crush. They need to be drained of any fluids and stationed to be ready to load on a flatbed. They can then be shipped out. A crusher is not needed for them.
- Appliances that may contain refrigerant—fridges, freezers, air conditioners—should not have their refrigerant removed in the community, nor should they be crushed. Instead, they need to be assembled in one of the trailers in the Transfer Station.

The process for dealing with Derelict Vehicles is:

- *Collection*
  - Derelict Vehicles need to be assembled in an area where they can conveniently be dealt with.
    - This will begin with harvesting all salvageable parts.
  - Most of the derelict cars in Sayisi Dene are already in the Derelict Equipment Area. A few others are gathered together at the Capped Landfill. One or two are still in the community. These will all need to be collected on solid ground near the Public Works Garage.
- *Decommissioning*
  - The vehicles must be made safe to transport and the recyclables on them segregated.
  - Fluids need to be drained and properly stored.
    - Oils, gas and diesel can all be burnt in the waste oil boiler.
  - Electronics, batteries, tires and any mercury switches need to be removed and properly stored at the Transfer Station, ready for shipping out on the winter road to the appropriate PRO.
- *Crushing*
  - A mobile crusher will be brought into the community every third year.
  - Pickup trucks and cars can be crushed. Larger vehicles and equipment cannot be crushed.
- *Stacking*
  - Crushed vehicles need to be stacked, ready for loading.
- *Loading*
  - The flattened vehicles will need to be loaded onto flatbed trailers and secured for travel.

  - The larger vehicles and equipment—those too big to crush—will also need to be loaded.
  - Usually, the flatbeds will come into the community loaded with equipment and supplies. Once they are unloaded, the vehicles and equipment will need to be quickly stacked and secured on them.
- *Transporting*
  - It is expected that outside trucking companies will do most of the transporting.
- *Selling*
  - Some of the vehicles and equipment can be sold for parts. Most, however, can only be sold for scrap. The revenue from these sales will offset the cost of transport, and *some* of the cost of paying people to decommission them.

Some training has already been done and further training is needed. ***Further training can occur as soon as the hoist is installed in the Public Works Garage.***

There are also derelict appliances ("white goods") that need to be dealt with. These can be crushed and shipped out with the crushed cars.

3.4.9. MONITORING CURRENT AND LEGACY WASTE SITES

As noted in the Capped Landfill section, above, there are monitoring wells in the Capped Landfill that need to be sampled. Monitoring wells will also need to be installed and monitored at the current WMF.

3.5. Requirements

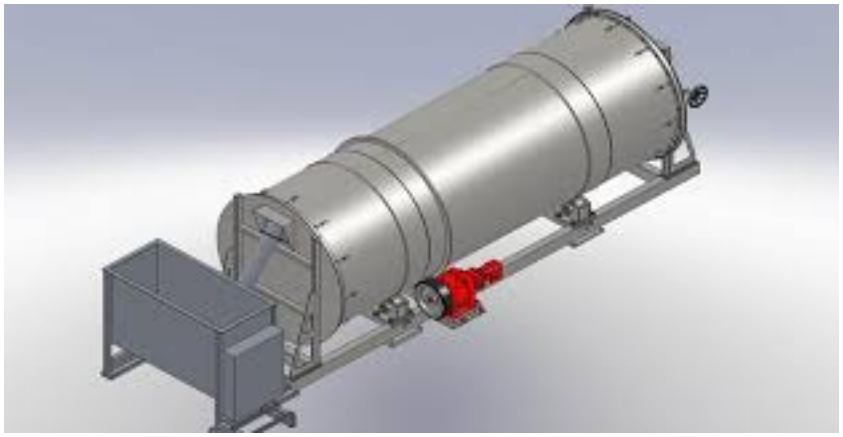
A number of items are required to implement this Plan—including equipment, materials and facilities.

3.5.1. EQUIPMENT

3.5.1.1. In-Vessel Composter

Perhaps the most important piece of equipment needed for this Plan is an in-vessel composter.

Figure 67: CAD Drawing of In-Vessel Composter



A number of Manitoba companies manufacture in-vessel composters, and they come in a variety of configurations. This Plan requires one that can be added on to, to accommodate the increasing volume of diverted organics that can be expected as this Plan progresses.

In-vessel composters are standard equipment in the hog industry, and are often found in other commercial animal operations as well. They have a number of advantages over the alternatives:

- Windrow composting is more suitable for larger operations
  - Windrow composting is likely to attract animals at Sayisi
  - For truly effective windrow composting, a large compost-turner is needed
- In-yard composting can only take pre-consumer vegetable waste
  - For Sayisi, the composting operations will need to be able to take post-consumer and animal materials
  - Unless it is carefully managed, in-yard composting also attracts animals

An in-vessel composter will need to be ordered in Fall 2018 and shipped up on the 2019 winter road.

3.5.1.2. Compact-Track Loader

A skid-steer (also known as a Compact-Track Loader) is a versatile piece of equipment needed to implement this Plan. It is needed to:

- Move materials in the WMF
- Load the in-vessel composter
- With a forks attachment, transport pallets and bulk bags containing recyclables
- With an auger attachment, be used to build the perimeter fence and fencing separators in the WMF
- With a grappling attachment, move waste and recyclables collected in the community
- With a bumper hitch, to haul a trailer
- In addition to these uses, this Loader will also be useful for transporting logs and chips in the Renewable Energy Project and moving building supplies for new housing and housing renovations

Figure 68: Compact-Track Loaders


with Pallet Forks & Load

with Auger Attachment

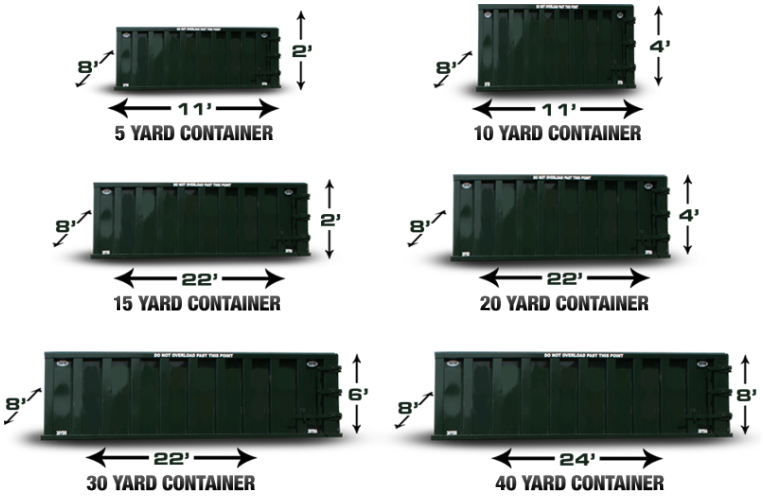
with Grappler

3.5.1.3. Roll-On-Roll-Off Trailer & Bin

Roll-On-Roll-Off Bins are versatile collection and storage bins that can be used as recycling collection bins, as construction waste bins, and as storage bins for recyclables.

Figure 69: Roll-On-Roll-Off Trailer

Figure 70: Roll-On-Roll-Off Bins[20]



This Plan will require a trailer, plus 6 small bins in the 5-to-15 yard size.

[20] Source: Moore Recycling http://moorescrapmetal.com/roll-off-containers/3257475

3.5.1.4. Electric Runabout

The Crew will need a small vehicle for transporting staff and materials. The most appropriate vehicle for this use in Sayisi Dene is an electric side-by-side off-road vehicle. The three best options are from Polaris, Textron, and Club Car.[21]

Figure 71: Electric Off-Road Side-By-Sides

Polaris
Ranger EV[22]

Textron
Prowler EV[23]

Club Car
Carryall 510 LSV[24]

Whichever vehicle is chosen, it would need some modification—the Polaris or Textron would need a cab enclosure; the Club Car would need a raised suspension and off-road wheels.

Because this runabout will be used, in part, to transport project staff to and from the WMF, the back section should have 2 seats, rather than the small carry-tray shown on the Club Car.

Either one of these vehicles can tow about 1,000 pounds. A small trailer to tow behind it would also be needed.

[21] There are, of course, many electric vehicle options. These three are recommended because they can operate on rough gravel roads, are easily serviced, have good sales support in Canada, and have proven track records.

[22] Source: https://ranger.polaris.com/en-ca/ranger-ev/

[23] Source: https://textronoffroad.txtsv.com/side-by-side/electric/prowler-ev

[24] Source: https://www.clubcar.com/us/en/commercial/street-legal-vehicles/carryall-510-lsv.html

Figure 72: Trailer Options for the Runabout

Yutrax
TX158[25]

ABI
Workman XL[26]

Country ATV
7550ATV[27]

If something is too large heavy to be transported with the Side-By-Side and its trailer, it can be transported with a pickup truck and either the roll-on-roll-off trailer and a container or the trailer available at the Public Works Garage

Figure 73: Trailer at the Sayisi Dene Public Works Garage

The Compact-Track Loader, if it has a bumper-hitch attachment, could also pull this trailer.

[25] Source: https://www.amazon.ca/Yutrax-TX158-Warrior-Utility-Trailer/dp/B001O00WQW/ref=sr_1_18?ie=UTF8&qid=1534554200&sr=8-18&keywords=yutrax

[26] Source: https://www.abiattachments.com/atv-trailer/workman-xl-dump-trailer/#gallery

[27] Source: http://countryatv.com/7550atv.html

3.5.1.5. Paper Shredder

Paper can be shredded and used as "browns" for composting in the in-vessel composter. (See Recycling Organics, above).

A small paper shredder—like the ones typically sold at an office supply store—are only meant for use for small volumes. They also can take only a few pages at a time.

Given that it will be used to all the paper available from all sources in the community, a larger-volume shredder is needed.

Figure 74: Larger-Volume Paper Shredder

A shredder of this type can take about 50 sheets at a time, and handle staples and paper clips, as well as thick paper. It will have a large-volume receptacle, so that the Large Recycling Bags can be put inside them to collect the shredded paper.

3.5.1.6. Vertical Baler

A small baler is needed to compact small plastics, metal drink cans and (when appropriate) paper and cardboard, into bales.

Figure 75: Vertical Balers

Harmony Enterprises[28]
M30HD

Latta Equipment[29]
B3

Cram-A-Lot[30]
VB-60

The bales can be stored at the Transfer Station, either for shipment out or for future in-community use, as appropriate.

3.5.1.7. Pallet Jack

Figure 76: Pallet Jack

A Pallet Jack for Sayisi Dene has already been purchased as part of the Derelict Vehicle Project, and will go into the community on the 2019 Winter road.

[28] Source: https://harmony1.com/harmony-products/30-inch-baler-m30hd-vertical-baler/

[29] Source: https://lattaequipment.com/product/vertical-baler/

[30] Source: https://www.cram-a-lot.com/vb-balers

3.5.1.8. Weigh Scale

A weigh scale suitable for weighing Bulk Bags and Sealable Bulk Containers will be needed in the Transfer Station.

Figure 77: Pallet Weigh Scale

3.5.1.9. Replacement Truck

Garbage is currently collected and transported to the WMF with a used cube van. This vehicle is adequate to current needs, but will need to be replaced at some point during first few years of this Plan.

When the current cube van needs to be replaced, if a viable electric pickup truck is commercially available, it would be the best choice.[31] A hybrid truck—if one is available would be an acceptable second choice.

This pickup truck would pull the Roll-On-Roll-Off Trailer for collection rounds.

[31] One of the important benefits of an electric truck is its ability to replace an electric generator which power tools are needed in the field.

3.5.2. MATERIALS

Materials are consumables that are required for waste and recycling activities. Some can be built in the community, either on site or in the Construction Shop, and some will need to be brought in on the winter road.

Some consumables (like Community Collection Bins) will last a number of years before they need to be replaced. Others (like Compostable Bags) will need to be replenished every year.

3.5.2.1. Household Collection Boxes

In order to ensure proper collection of recyclables and waste, houses need sturdy, permanent recycling and waste boxes outside near the road. Fourplex and duplex units can share a box, as can pairs of houses close together. More isolated houses will need individual boxes.

Figure 78: Typical Household Collection Box

These Household Collection Boxes can be made from local wood in the Construction Shop. A log version of these boxes will be relatively easy to make—using primarily logs 2" in diameter. They will not require trucked-in OSB or plywood, will be bear-resistant, will look good, and will last a long time. By reducing the design's dependence in imported plywood, they can be made more durable and easier to repair. This will also maximize local employment in construction.

Each household will need to become responsible for separating their recyclables into two different bags, and putting both their waste and their recyclables in their Household Collection Box.

Approximately 50 will need to be made initially. Once an initial set is made, it can be expected that only three or four will need to be built each year.

3.5.2.2. Community Collection Bins

Both large and smaller Community Collection Bins will be needed. The Crew in the Project (see above) built four of these—two large and two small.

Figure 79: Four Community Collection Bins Built During the Project

The larger Bins have three receptacles for materials, encouraging community members to begin the process of separating waste.

The smaller Bins are single-opening receptacles. These can be used either for comingled recyclables or for non-recyclable waste.

These four Bins were made with found materials—plywood left over from a construction project and derelict wood pallets.

Depending on community preference, these can either be made in the Construction Shop from local wood, or contributed by Multi Materials Stewardship Manitoba.

If more are made in the community, a design upgrade to using local wood, trimmed to size (rather than scrap lumber) is needed. If MMSM contributes the Large Collection Bins, because they are outside, they must be Bear-Resistant bins.

Sayisi will need about 10 Large and 20 Small Community Collection Bins:

- Large Collection Bin Locations include 1 each outside:
  - Peter Yassie Memorial School
  - Northern Store

  - Beach
  - Public Works Garage
  - Nursing Station
  - Nursing Residences
  - Teacherages
  - Airport
- Small Collection Bin locations (all inside buildings) include:
  - 2 each in:
    - Band Office
    - Band Hall
    - New Rink
  - 1 each in:
    - Airport
    - Hotel
    - Jordan's Principle
    - Church
    - Northern Store
    - Multiplex
  - 4 in Peter Yassie Memorial School

3.5.2.3. Wood Platforms for Roll-On-Roll-Off Containers

The Roll-On-Roll-Off Containers should be placed on a piece of OSB, plywood or other solid surface. Otherwise, they will sink into the gravel or dirt when it rains or the snow melts, clogging up the steel wheels of the trailer that picks them up. These pltforms can be as simple as a sheet of salvaged OSB or a couple of pallets, or as elaborate as a small frame with logs attached on top, similar to the dock built with local materials at Lac Brochet.

Figure 80: Dock Built with Small Logs at Lac Brochet

3.5.2.4. Bulk Bags

Bulk bags will be needed to collect and store the recyclables received within the Transfer Station.

Figure 81: Bulk Bag on a Pallet

These bulk bags can be used for all non-toxic recyclables, including:

- Commingled recyclables
- eWaste
- Plastic containers
- Drink cans

- Cardboard
- Shredded paper

Some of what is collected in these Bulk Bags—such as drink cans—can be further compacted using the Vertical Baler. Other items (such as eWaste) will remain stored in these Bulk Bags until they are shipped out on the winter road.

3.5.2.5. Pallets

This Plan will need wooden pallets to store recyclables on, primarily in the Transfer Station. Approximately two dozen of these pallets were found discarded around the community during the Project and were collected by the Crew.

Figure 82: Two of the Discarded Pallets in the Derelict Equipment Area

Some of the pallets the Crew collected were used to make Community Collection Bins; the remainder were stored for future use in this Plan.

Pallets will need to be systematically collected from truck shipments during and after the winter road season, as well as from cargo plane deliveries. Pallets last quite a while, but some will need to be replaced year by year.

3.5.2.6. Sealable Bulk Containers

Some materials cannot be stored in Bulk Bags, including:

- Household batteries
- Car batteries
- Household Hazardous Waste (HHW)
- Waste oil & waste oil products such as oil filters
- Tires

The waste oil will be collected and burned in the oil burner that was shipped up on the 2018 winter road, and is to be installed in the Public Works Garage in Fall 2018.

Tires will be assembled and either reused to make raised beds and tire towers for growing local food, or shipped south.

The remainder can be stored in Sealable Bulk Containers, as they are at the Brady WMF in Winnipeg.

Figure 83: Sealable Bulk Containers at Brady WMF in Winnipeg, Wrapped for Transport

10 to 20 of these (the exact number will depend on space in the shipping container that will need to go up on the 2019 winter road) will need to be shipped up on the 2019 winter road. After that, each year, the number that need to be shipped up empty will need to match the number that are shipped down full.

3.5.2.7. Stretch Wrap

Once they are filled with a particular waste, the lids of these Sealable Bulk Containers are sealed with stretch wrap.

Figure 84: Stretch Wrap and Dispenser

3.5.2.8. Large Recycling Bags

Once Sayisi Dene has a biomass-based district heating loop, it will be possible to have a community laundromat—and use that laundromat to wash significant numbers of reusable bags. Until then, the most efficient bags to collect recyclables in are large, heavy-duty poly bags.

Figure 85: Large Recycling Bags

These need to be sized to fit the cylinders in the --- and other large waste containers--55 to 60 gallons. They should be as thick as possible—at least 1.5 mm—and can be either clear or blue.

Based on the work done during the Project, Sayisi will need 20 cartons (2,000 bags) to deal with the accumulated backlog, and then perhaps 5 cartons (500 bags) per year.

These bags are intended to be used for collection. The Bulk Bags and the Vertical Baler are better suited for storage.

If Compostable Bags can be found that can serve the same purpose, they should be preferred over the standard poly bags.

3.5.2.9. Trash Can Bands

These bands secure the Large Recycling Bags onto cylinders inside the large Community Collection Bins.

Figure 86: Trash Can Bands

One carton (400 bands) will be needed to start. After that, they can be ordered as needed.

3.5.2.10. Compostable Bags

Once the In-Vessel Composter is operating, community members will be invited to contribute materials to it. These materials will include household compostables, compostables from school food programs, and fish waste.

In most cases, these materials will need to be collected with compostable bags. Care will need to be taken in the sourcing of these bags to ensure that they are, in fact, compostable in an in-vessel composter. These need to be certified to ASTM D6400[32], or an equivalent standard.

[32] See https://www.astm.org/Standards/D6400.htm for details of this standard.

Figure 87: ASTM Standard D6400 Compostable Bags

The most active supplier in Manitoba specializing in these bags is Canada Green Natural Products[33]. This company can also supply biodegradable substitutes for styrofoam coffee cups, plastic cutlery & dishes, disposable gloves, and disinfectant wipes.

3.5.2.11. Safety Equipment

The people working on waste and recycling need appropriate equipment and clothing. This includes:

- Garbage gloves
- Boots
- Safety vests
- Trash Pickers
- Head bug nets
- Bug spray
- Gloves and aprons for handling batteries

Some of these will be last more than a single year; most will need to be purchased each year.

[33] See http://www.cagreen.ca

3.5.3. FACILITIES

3.5.3.1. Access to a Construction Shop

In order to maximize the amount of local labour and local materials that are used in this Plan, we will need access to a local construction shop.

There a building next to the school that was originally designed to be used for shops classes. This building would be an ideal constructions shop.

Figure 88: Unused Building Beside School (Exterior)

Figure 89: Unused Building Beside School (Interior)

It would appear that there are no shop tools in this building. If none were purchased, or if they cannot be located, suitable ones for this project can be purchased for approximately $8,000. The key tools needed are:

- Table saw
- Drill press
- Chop saw or mitre saw
- Shop vacuuming system
    - all sawdust & chips should be used to make gardening soil in the In-Vessel Composter
- Bench or table planer
- Jigs & clamps
- A press for gluing together Cross-Laminated Timber[34]
- Stationary compressor (for air tools and the press)

Additional small tools (air tools, wrenches, pliers, screwdrivers, etc.) were sent up as part of the Derelict Vehicle Project, and can be used in this shop as well. All of these tools will also be useful in the Shelter Project.

3.5.3.2. Transfer Station[35]

Recyclables of all kinds will be received at the Transfer Station. Most will be brought in by the Waste & Recycling staff, but some will be dropped off by community members. They will be sorted at the Station and stored temporarily, before being either reused in the community or shipped out on the winter road

At least initially, this Transfer Station can be created from four semi-trailers that are currently in the community and that cannot be made road-worthy. They need to be assembled together on stable, level ground, and put up on blocks.[36]

The Transfer Station needs to be located where it can have access to electricity[37] and room for expansion. The most viable location is immediately adjacent to the Public Works Garage. The area around the Station will need to accommodate vehicles dropping

[34] Cross-Laminated Timber is a building technique that (among other uses) can create substitutes for OSB and plywood from small trees. See https://en.wikipedia.org/wiki/Cross-laminated_timber

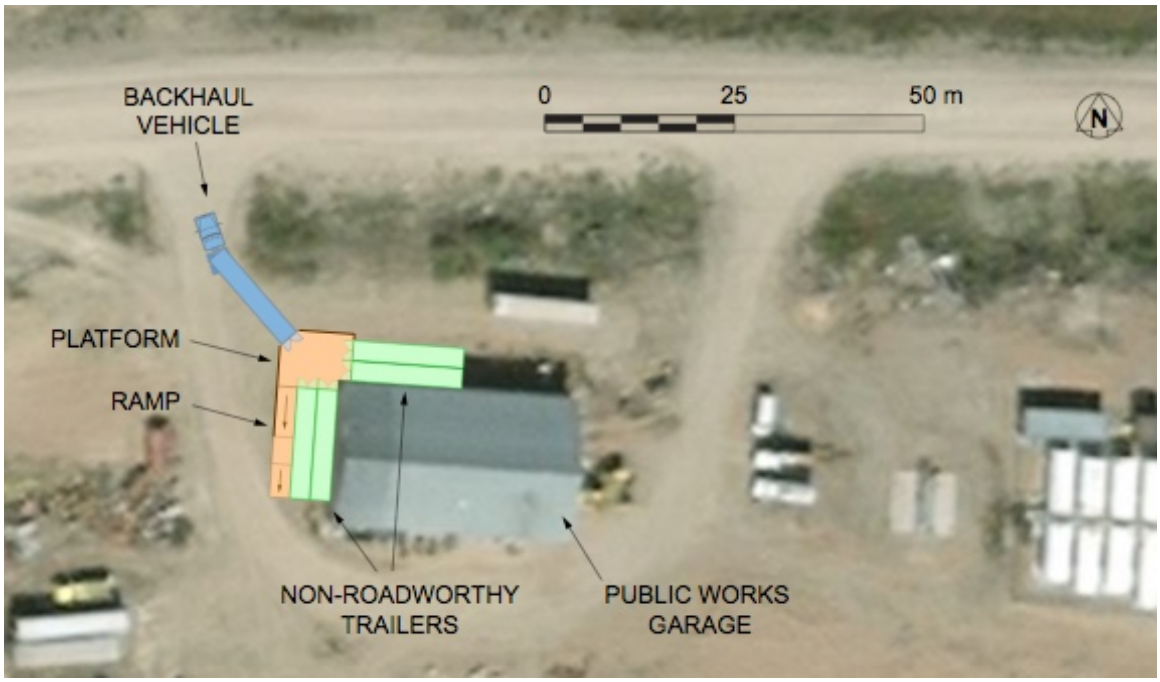
[35] Technically, this should be called a "Reception, Sorting, Storage and Transfer Station". Calling it a "Transfer Station" is simpler but it should be remembered that it will serve all of these functions.

[36] Larger communities have larger Transfer Stations, often with powered sorting tables. See the appendix Transfer Station Examples. It is conceivable that the recycling activities will exceed the capacity of these trailers. If that happens, two more trailers can be added alongside the two north trailers. It is not expected that, at least in the first four years of this initiative, Sayisi Recycles will need more space than this—or a powered sorting table. By not spending money on a larger building, or a powered sorting table, Sayisi Recycles can focus its spending on employing community members for this work

[37] The need for electricity means that it cannot be located at the WMF; installing electricity at the WMF would be very expensive. Over time, locating it away from the WMF will also increase the diversion of recyclables from the waste stream because recyclables will never need to go the WMF

off and picking up materials. Traffic flow needs to be designed so that it does not interfere with Public Works vehicles or operations.

Figure 90: Proposed Transfer Station



The four non-roadworthy trailers would hold all material scheduled to go out on the winter road. For ease of operation, once the trailers are assembled, the bulkheads between each of the trailer pairs can be opened up.

The Ramp is to be sloped so that recyclables can be brought up to the trailers and placed either in Sealable Bulk Containers or Bulk Bags on Pallets, using either the Compact-Track Loader or the Pallet Jack. To aid off-loading, the Ramp should have a short level section at the same height as a bin sitting on the Roll-On-Roll-Off Trailer.

The Platform needs to be the same height as the semi-trailer floors, with a safety railing on its north and west sides. The northwest corner of the Platform needs to be open, so semis that would otherwise go back empty can back in and have recyclable goods transferred quickly and easily.

The frame underneath the Ramp and Platform can be made from local logs, cut and assembled on site. The surface of the Ramp and Platform can be made from Cross-Laminated Timber, also made from local wood.

A separate space needs to be set aside either within or beside the Transfer Station for:

- Appliances
  - that may contain refrigerants[38]
  - that do not contain refrigerants[42]
- Tires

Separate outdoor areas easily accessible to the Transfer Station are needed for:

- The In-Vessel Composter
- Organic material before it is put in the In-Vessel Composter[43]
- Compost after it has been put through the In-Vessel Composter
- Derelict equipment and vehicles
  - Before they are decommissioned
  - After they are decommissioned
  - After they are crushed
- Construction waste

This Transfer Station should be operate in accordance with the Standards for Transfer Stations in Manitoba.[39] Although these standards may not be legally required on Dene territory, keeping to these standards will ensure that the waste and recycling services for the on-reserve Sayisi Dene members meet or exceed those provided off-reserve.

3.5.3.3. Recycling Depot

As noted in the section Searching for an In-Community Recycling Depot, a small Recycling Depot is needed in the heart of the community. It will serve as:

- The hub for recycling activities by community members, raising awareness and ensuring that recycling is convenient and top-of-mind for community members[40]
- A place to give away materials that have been salvaged and can be reused, such as gardening soil (from the In-Vessel Composter) and salvaged wood suitable for building
- The Sayisi Recycles staff office

[38] These include fridges, freezers, air conditioners, and dehumidifiers. See Managing External Agreements for how different appliances are recycled

[39] Department of Sustainable Development. "Standards for Transfer Stations in Manitoba". Government of Manitoba. https://www.gov.mb.ca/sd/envprograms/swm/pdf/standard_for_transfer_stationts.pdf

[40] It may seem like a good idea to use the Transfer Station at the Public Works Garage as the Recycling Depot. Putting the Recycling Depot in the centre of the community is essential—at least in the first years of this initiative—if the goal is to make significant changes in how community members deal with waste and recycling

3.5.3.4. Renewed Waste Management Facility

As noted earlier in this report, the current Waste Management Facility is in danger of becoming a repeat of Sayisi Dene's garbage dumps of the past.

The Current Project section reported on initial steps taken to change how this Facility is managed. If this Plan is followed, the upcoming year will set a new course for its operation.

The Detailed Timelines list activities to be undertaken in each of the next four years to bring the WMF to the state where it is being operated sustainably. The Facility itself does not need radical reinvention. However, a systematic approach, outlined earlier, is needed to bring the it into compliance.

3.6. Plan Cost Estimates

Table 9: Summary Cost Estimates

	Year			
	1	*2*	*3*	*4*
Cost Category	*2018-19*	*2019-20*	*2020-21*	*2021-22*
Professional and technical services	$27,500	$27,500	$14,500	$12,000
Other personal services	$0	$0	$0	$0
Meetings	$1,300	$1,900	$1,900	$1,900
Communications	$300	$300	$300	$300
Training delivery and trainee costs	$3,660	$3,660	$3,660	$3,660
Work experience initiatives	$14,400	$14,400	$7,200	$7,200
Economic infrastructure	$0	$0	$0	$0
Salaries and wages	$83,600	$181,600	$128,800	$128,800
Travel	$15,800	$15,800	$15,800	$15,800
Overhead	$22,026	$33,383	$18,075	$21,469
Minor machinery and equipment	$130,200	$166,380	$9,450	$79,450
Capital (equity)	$0	$0	$0	$0
Other	$8,600	$5,480	$3,860	$5,300
totals	***$307,386***	***$450,403***	***$203,545***	***$275,879***

Table 10: Detailed Cost Estimates

Year 1	
Cost Category	**Budget**
Professional and technical services	
project lead	$10,000
waste site monitoring & remediation	$10,000
recycling initiatives	$2,500
community engagement	$2,500
governance & management	$2,500
Professional and technical services subtotal	*$27,500*
Meetings	
1 community meeting @ $700/meeting	$700
2 community team meetings @ $300/meeting	$600
Meetings subtotal	*$1,300*
Communications	
internet: 3 months @ $50/month	$150
phone: 3 months @ $25/month	$75
long distance: 3 months @ $25/month	$75
Communications subtotal	*$300*
Training delivery and trainee costs	
6 trainees for 40 hours each @ $13/hour	$3,120
6 trainees, 5 lunches each @ $18/lunch	$540
Training delivery and trainee costs subtotal	*$3,660*
Work experience initiatives	
4 work experience participants for 240 hours each @ $15/hour	$14,400
Work experience initiatives subtotal	*$14,400*
Salaries and wages	
1 crew lead for 1000 hours each @ $20/hour	$20,000
1 employees for 1000 hours each @ $18/lunch	$18,000
4 person-years 760 hours each @ $15/hour	$45,600
Salaries and wages subtotal	*$83,600*
Travel	
to Winnipeg: 8 return flights @ $1600/flight	$12,800
to Thompson: 6 return flights @ $500/flight	$3,000
Travel subtotal	*$15,800*
Overhead	
5% of equipment expenses	$6,510
10% of non-equipment expenses	$15,516
Overhead subtotal	*$22,026*
Minor machinery and equipment	
In-Vessel Composter	$40,000
Compact-Track Loader & Attachments	$38,000
Electric Runabout	$17,000
Paper Shredder	$5,000
Vertical Baler	$10,000
Weigh Scale	$500
Household Collection Boxes: 25 boxes @ $200 each	$5,000
Small Community Collection Bins: 10 bins @ $100 each	$1,000
Large Community Collection Bins: 5 bins @ $1000 each	$5,000
Bulk Bags: 250 bulk bags @ $50 each	$2,500
Sealable Bulk Containers: 200 sealable bulk containers @ $100 each	$1,000
Stretch Wrap: 150 stretch wrap @ $150 each	$150
Boxes of Large Recycling Bags: 1000 boxes of large recycling bags @ $100 each	$2,000
Box of Trash Can Bands: 50 box of trash can bands @ $50 each	$50
Boxes of Compostable Bags: 500 boxes of compostable bags @ $100 each	$1,000
Safety Equipment	$2,000
Minor machinery and equipment subtotal	*$130,200*
Other	
Accommodation: 20 days @ $180/day	$3,600
Food: 20 meals @ $100/day	$2,000
Materials printing	$3,000
Other subtotal	*$8,600*
total:	***$307,386***

Year 2	
Cost Category	**Budget**
Professional and technical services	
project lead	$7,500
waste site monitoring & remediation	$10,000
recycling initiatives	$2,500
community engagement	$2,500
governance & management	$5,000
Professional and technical services subtotal	*$27,500*
Meetings	
1 community meeting @ $700/meeting	$700
4 community team meetings @ $300/meeting	$1,200
Meetings subtotal	*$1,900*
Communications	
internet: 3 months @ $50/month	$150
phone: 3 months @ $25/month	$75
long distance: 3 months @ $25/month	$75
Communications subtotal	*$300*
Training delivery and trainee costs	
6 trainees for 40 hours each @ $13/hour	$3,120
6 trainees, 5 lunches each @ $18/lunch	$540
Training delivery and trainee costs subtotal	*$3,660*
Work experience initiatives	
4 work experience participants for 240 hours each @ $15/hour	$14,400
Work experience initiatives subtotal	*$14,400*
Salaries and wages	
1 crew lead for 2000 hours each @ $20/hour	$40,000
1 employees for 2000 hours each @ $18/lunch	$36,000
4 person-years 1760 hours each @ $15/hour	$105,600
Salaries and wages subtotal	*$181,600*
Travel	
to Winnipeg: 8 return flights @ $1600/flight	$12,800
to Thompson: 6 return flights @ $500/flight	$3,000
Travel subtotal	*$15,800*
Overhead	
5% of equipment expenses	$8,319
10% of non-equipment expenses	$25,064
Overhead subtotal	*$33,383*
Minor machinery and equipment	
Roll-On-Roll-Off Trailer & Bins	$61,530
Household Collection Boxes: 25 boxes @ $200 each	$5,000
Small Community Collection Bins: 10 bins @ $100 each	$1,000
Large Community Collection Bins: 5 bins @ $1000 each	$5,000
Wood Platforms for Roll-On-Roll-Off Containers: 6 platforms @ $200 each	$1,200
Bulk Bags: 5 bulk bags @ $50 each	$250
Sealable Bulk Containers: 2 sealable bulk containers @ $100 each	$200
Stretch Wrap: 1 stretch wrap @ $150 each	$150
Boxes of Large Recycling Bags: 10 boxes of large recycling bags @ $100 each	$1,000
Box of Trash Can Bands: 1 box of trash can bands @ $50 each	$50
Boxes of Compostable Bags: 5 boxes of compostable bags @ $100 each	$500
Safety Equipment	$500
Transfer Station Platform & Ramp	$10,000
Recycling Depot Retrofit	$10,000
WMF Fencing & Gates	$70,000
Minor machinery and equipment subtotal	*$166,380*
Other	
Accommodation: 12 days @ $180/day	$2,880
Food: 12 meals @ $100/day	$1,600
Materials printing	$1,000
Other subtotal	*$5,480*
total:	***$450,403***

Year 3	
Cost Category	**Budget**
Professional and technical services	
project lead	$5,000
waste site monitoring & remediation	$2,000
recycling initiatives	$2,500
community engagement	$2,500
governance & management	$2,500
Professional and technical services subtotal	*$14,500*
Meetings	
1 community meeting @ $700/meeting	$700
4 community team meetings @ $300/meeting	$1,200
Meetings subtotal	*$1,900*
Communications	
internet: 3 months @ $50/month	$150
phone: 3 months @ $25/month	$75
long distance: 3 months @ $25/month	$75
Communications subtotal	*$300*
Training delivery and trainee costs	
6 trainees for 40 hours each @ $13/hour	$3,120
6 trainees, 5 lunches each @ $18/lunch	$540
Training delivery and trainee costs subtotal	*$3,660*
Work experience initiatives	
2 work experience participants for 240 hours each @ $15/hour	$7,200
Work experience initiatives subtotal	*$7,200*
Salaries and wages	
1 crew lead for 2000 hours each @ $20/hour	$40,000
1 employees for 2000 hours each @ $18/lunch	$36,000
2 person-years 1760 hours each @ $15/hour	$52,800
Salaries and wages subtotal	*$128,800*
Travel	
to Winnipeg: 8 return flights @ $1600/flight	$12,800
to Thompson: 6 return flights @ $500/flight	$3,000
Travel subtotal	*$15,800*
Overhead	
5% of equipment expenses	$472.50
10% of non-equipment expenses	$17,602
Overhead subtotal	*$18,075*
Minor machinery and equipment	
Household Collection Boxes: 4 boxes @ $200 each	$800
Small Community Collection Bins: 10 bins @ $100 each	$1,000
Large Community Collection Bins: 5 bins @ $1000 each	$5,000
Bulk Bags: 5 bulk bags @ $50 each	$250
Sealable Bulk Containers: 2 sealable bulk containers @ $100 each	$200
Stretch Wrap: 1 stretch wrap @ $150 each	$150
Boxes of Large Recycling Bags: 10 boxes of large recycling bags @ $100 each	$1,000
Box of Trash Can Bands: 1 box of trash can bands @ $50 each	$50
Boxes of Compostable Bags: 5 boxes of compostable bags @ $100 each	$500
Safety Equipment	$500
Minor machinery and equipment subtotal	*$9,450*
Other	
Accommodation: 12 days @ $180/day	$2,160
Food: 12 meals @ $100/day	$1,200
Materials printing	$500
Other subtotal	*$3,860*
total:	***$203,545***

Year 4	
Cost Category	**Budget**
Professional and technical services	
project lead	$2,500
waste site monitoring & remediation	$2,000
recycling initiatives	$2,500
community engagement	$2,500
governance & management	$2,500
Professional and technical services subtotal	*$12,000*
Meetings	
1 community meeting @ $700/meeting	$700
4 community team meetings @ $300/meeting	$1,200
Meetings subtotal	*$1,900*
Communications	
internet: 3 months @ $50/month	$150
phone: 3 months @ $25/month	$75
long distance: 3 months @ $25/month	$75
Communications subtotal	*$300*
Training delivery and trainee costs	
6 trainees for 40 hours each @ $13/hour	$3,120
6 trainees, 5 lunches each @ $18/lunch	$540
Training delivery and trainee costs subtotal	*$3,660*
Work experience initiatives	
2 work experience participants for 240 hours each @ $15/hour	$7,200
Work experience initiatives subtotal	*$7,200*
Salaries and wages	
1 crew lead for 2000 hours each @ $20/hour	$40,000
1 employees for 2000 hours each @ $18/lunch	$36,000
2 person-years 1760 hours each @ $15/hour	$52,800
Salaries and wages subtotal	*$128,800*
Travel	
to Winnipeg: 8 return flights @ $1600/flight	$12,800
to Thompson: 6 return flights @ $500/flight	$3,000
Travel subtotal	*$15,800*
Overhead	
5% of equipment expenses	$3,972.50
10% of non-equipment expenses	$17,496
Overhead subtotal	*$21,469*
Minor machinery and equipment	
Electric or Hybrid Pick-Up Truck	$70,000
Household Collection Boxes: 4 boxes @ $200 each	$800
Small Community Collection Bins: 10 bins @ $100 each	$1,000
Large Community Collection Bins: 5 bins @ $1000 each	$5,000
Bulk Bags: 50 bulk bags @ $50 each	$250
Sealable Bulk Containers: 100 sealable bulk containers @ $100 each	$200
Stretch Wrap: 150 stretch wrap @ $150 each	$150
Boxes of Large Recycling Bags: 100 boxes of large recycling bags @ $100 each	$1,000
Box of Trash Can Bands: 50 box of trash can bands @ $50 each	$50
Boxes of Compostable Bags: 100 boxes of compostable bags @ $100 each	$500
Safety Equipment	$500
Minor machinery and equipment subtotal	*$79,450*
Other	
Accommodation: 8 days @ $180/day	$800
Food: 8 meals @ $100/day	$4,000
Materials printing	$500
Other subtotal	*$5,300*
total:	***$275,879***

4. APPENDICES

4.1. Council Consent Form Initiating Project

SAYISI DENE FIRST NATION
TADOULE LAKE, MAN
R0B 2C0
TEL (204) 684-2022
FAX (204) 684-2069

Sayisi Dene First Nation
Council Consensus Form
CCF# ____________

Whereas: an issue has been submitted that:

The Comprehisive Community Plan sets recycling and cleaning up the waste dump as priorities for our community

Whereas: the issue has been assessed that:

Therefore, Be It Resolved That:

We will make an application to the LPDSP program for phase 1 of this initiative in the 2017-18 fiscal year and for further phases in future years to implement these priorities

We delegate Councillor R. Powderhorn to take the lead on this initiative.

Chief ____________ Councillor ____________

Councillor ____________ Witness ____________

4.2. LEDSP Application

First Nation Solid Waste Management Initiative Proposal Form (313)
Lands & Economic Development Services Program

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A PROGRAM IDENTIFICATION

Program identification and primary project objective
Primary project objective: Environment – Prevention Operations

Key activities (check all which apply)

- ■ Planning Studies
- ■ Education, training and capacity building
- ■ Coordination of waste programs and deployment of waste diversion programs, such as recycling or composting
- ☐ MTSA development or similar
- ☐ Other

Project name:	Date of application:
Sayisi Dene First Nation Waste & Recycling Management Planning Phase 1	January 6, 2018

B APPLICANT/PROPONENT INFORMATION

1. Organization Contact Information

Name: Sayisi Dene First Nation

Applicant Eligibility:
- ◉ First Nation and Inuit communities and their governments, including Tribal Councils
- ○ Aboriginal organizations
- ○ Other: (Identify the applicant's relationship to First Nation, Inuit community or Tribal Council):

Associated First Nation (if applicable or different from organization name):

Contact name and title:	Phone:	Fax:
Councillor Robert Pauderhorn	(204) 684-3022	(204) 684-2069
Mailing Address: General Delivery	Email: robroypow@Gmail.com	

2. Summary of Previous Funding (in relation to this project)

If this project is a continuation of a previously funded project please provide details of the project and funding received:
None.

C PROJECT INFORMATION

1. Description of the Project

a. Describe your project (*Include location, comments on industry and market studies and summarize attached relevant materials (feasibility study, management plan, training, business plan related to waste management, etc):*

Summary

- Develop a long-term, comprehensive community Waste Plan for Sayisi Dene First Nation to manage all our wastes in an environmentally-sustainable, cost-effective manner.
- Gather and prepare all material needed, including costs, to be ready to implement that Waste Plan.

Detail

1. Develop a comprehensive community waste and recycling plan (a "Waste Plan") for Sayisi Dene First Nation ("Sayisi").
    - This Waste Plan would include plans (with costing) to:

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- Clean up the current waste dump and surrounding area.
- Clean up legacy waste materials not in the current waste dump.
- Properly collect all wastes in the future.
- Recycle everything that can be recycled within the community, including organics, paper, and waste vehicle oil.
- Send all recycling materials that cannot be recycled within the community to the appropriate Product Recycling Organization and other recycling end-users, including derelict vehicles and other metal, white goods, vehicle batteries and tires, household batteries, cell phones, and eWaste.
- Properly dispose of anything that cannot be recycled.

2. Assemble a Community Recycling & Waste Team to champion the project and the Waste Plan:
   - This should include at least one of each from:
     - Elder
     - Youth
     - Band Council
     - Staff
     - Operations & Maintenance
     - Teacher
3. Develop a training plan, with costing, for band staff, school staff, students, and community members to implement and manage the Waste Plan.
4. Begin training, work experience program and hiring of Waste & Recycling Coordinators.
5. Determine the need for monitoring and/or remediation of legacy waste dump sites within our community
6. Determine all machinery, equipment and facilities (if any) required to implement the Waste Plan. These could include:
   a) Trailer(s) for transporting recycling materials, both within the community and to recycling reception locations in the south
   b) Collection boxes & signage
   c) A paper shredder
   d) A closed-vessel composting system
   e) A recycling depot
   f) Garbage truck
   g) Fencing
   h) Dumpsite liner
   i) Dumpsite sump pump and leachate handling equipment
7. Develop Waste & Recycling budgets for:
   - minor machinery and equipment
   - capital
   - Operations and Maintenance ("O&M") costs (ongoing)
8. Hold a community consultation to receive community feedback on this Waste Plan.
9. Complete a financial and narrative report on this project.

b. How does the project meet your community or representative organization's priorities? *(as identified in any of the following plans: Land use plan, Strategic economic development plan, Environmental management plan, Community Profile Report (DCI #471935), or Comprehensive community plan):*

This project flows directly out of the priorities set out in the Comprehensive Community Plan.

Specifically, see "Lands & Resources: Establish a recycling program in Tadoule Lake" and "Establish a better dump site and dump procedures to prevent garbage from spreading" under Current Priorities—pages 16 & 20.

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2. Project Activities and Deliverables

	Key Activities	Description (with Expected Start/End dates)	Expected Deliverables
1	Develop Waste Plan	2018 Jan – Mar	Draft & Finish Waste Plan
2	Assemble Community Recycling & Waste Team	2018 Jan – Feb	Minutes of meetings
3	Develop training plan to implement & manage Waste Plan	2018 Jan – Feb	Written training plan
4	Begin training, work experience & hiring	2018 Feb – Mar	Training, work experience & hiring report
5	Determine need for monitoring of legacy waste dump sites	2018 Jan – Feb	Written report
6	Determine all machinery, equipment, and facilities needed to implement Waste Plan	2018 Jan – Feb	Equipment list
7	Determine costs for minor machinery and equipment, capital, and O&M	2018 Feb – Mar	Budget
8	Hold community consultations	2018 Mar	Minutes of community consultations
9	Complete report	2018 Apr	Narrative & financial report (which includes all report elements of previous deliverables)

3. Project Costs

Costs: Eligible costs supported	$	Breakdown of costs	Are quotes / estimates to confirm costs attached?*
Professional and technical services	$19,000	attached	☐ Attached
Other personal services		attached	☐ Attached
Meetings	$1,600	Attached	☐ Attached
Communications	$500	Attached	☐ Attached
Training delivery and trainee costs	$3,120	Attached	☐ Attached
Work experience initiatives	$7,800	Attached	☐ Attached
Economic infrastructure			☐ Attached
Salaries and wages	$4,500	Attached	☐ Attached
Travel	$14,400	Attached	☐ Attached
Overhead	$5,386	Attached	☐ Attached
Minor machinery and equipment			☐ Attached
Capital (equity)			☐ Attached
Other	$2,940	Attached	☐ Attached
Total Eligible Costs	**$59,246**		

*Attach copies and estimates to application

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Lands & Economic Development Services Program

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4. Project Financing

Financing	$	Is funding approved?	Status and nature of funding approval*
First Nation		☐ Approved	
Partner		☐ Approved	
Debt		☐ Approved	
INAC	$59,246	☐ Approved	
Other Federal / Provincial		☐ Approved	
Other		☐ Approved	
Total Financing	**$59,246**		

5. Cash flow for the project

April		July		October		January	$20,000
May		August		November		February	$20,000
June		September		December		March	$19,246
Q1 Total		**Q2 Total**		**Q3 Total**		**Q4 Total**	**$59,246**

*Attach letters proving status of funding to application

6. Project Management

Who	Project role	Activities	Supporting documents attached?*
Bruce Duggan	Project Lead	Responsible for all aspects of project execution.	☐ Attached
Robert Pondelkan	Client's Representative	Authority to determine if project requirements are fulfilled.	☐ Attached

*Attach supporting documents such as resumes to application

7. Community Benefits and Other Benefits

Describe the expected benefits (or end results) that this project hopes to achieve in the short, medium and long-term.*	Provide examples of how these benefits will be measured (if applicable).
Short term: • Increase community awareness of waste and recycling options. • Increase community awareness of how waste and recycling activities can have a positive impact on environmental health (land, water, air) and human health. • Integrate school environmental education with in-community activities.	
Medium term: • Increased recycling, including organics. • Waste reduction. • Sustainable funding for waste management.	- Tonnes recycled per year. - Increased varieties of recycling (paper, plastics, metal, oil, batteries, tires, eWaste). - Revenues and expenses from waste match.

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Long term: • Zero annual increase in landfill waste. • Mitigation of legacy landfill sites (if needed).	- Zero unmanaged waste in community.

8. Land and Environmental

Please complete the following if the project will physically alter land (i.e. construction).

Will this project be located on First Nation reserve land? (•) Yes ( ) No	Identify location (Reserve name or project location):

Describe the land tenure required by the project.

(•) Ownership ( ) License
( ) Permit ( ) Certificate of possession
( ) Lease ( ) Other

Provide information on the status or next steps for acquiring land tenure. (e.g. land designation, draft lease or permit, etc)

Will the project be subject to a federal environmental assessment by the Canadian Environmental Assessment Agency, Canadian Nuclear Safety Commission or National Energy Board? If not, does AANDC's Environmental Review Process apply?

( ) Yes (•) No

Provide other significant and relevant information not provided elsewhere.

Describe key regulations and approval requirements that affect the development or operation of the project, describe that status of securing approvals, and outline measures that will address key regulations and approval requirements.

D APPLICANT APPROVALS

Name/Title Councilor Robert Pondehan	Signature Robert Pondehan
Date January 6, 2018	BCR required attached ☑ Attached

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Cost Breakdown

Professional and technical services		
Boke Consulting: Bruce Duggan - project lead		$5,000
KGS - consultation on legacy waste site monitoring & remediation		$3,000
DLF Consulting - consultation on recycling initiatives		$2,500
David Lane Consulting - consultation on waste project planning		$2,500
Curt Hull Consulting - consultaton on community engagement		$6,000
	Professional and technical services subtotal:	$19,000
Meetings		
1 community meeting @ $700 /meeting		$700
3 community team meetings @ $300 /meeting		$900
	Meetings subtotal:	$1,600
Communications		
teleconferencing		$500
	Communications subtotal:	$500
Training delivery and trainee costs		
4 trainees for 40 hours each @ $15/hour		$2,400
4 trainees 10 lunches each @ $18/lunch		$720
	Training delivery and trainee costs subtotal:	*$3,120*
Work experience initiatives		
2 work experience participants for 30 days each @ $130/day		$7,800
	Work experience initiatives subtotal:	*$7,800*
Salaries and wages		
1 employee for 30 days @ $150/day		$4,500
	Salaries and wages subtotal:	*$4,500*
Travel		
6 round trips @ $2400 /round trip		$14,400
	Travel subtotal:	*$14,400*
Overhead		
5% of equipment expenses		$0
10% of non-equipment expenses		$5,386
	Overhead subtotal:	*$5,386*
Other		
In-community accommodation: 8 days @ $180/day		$1,440
In-community meals: 8 days @ $125/day		$1,000
Materials printing		$500
	Other subtotal:	*$2,940*
	Total:	**$59,246**

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4.3. Household Hazardous Waste (HHW) Items

These are items that are marked with one or more of the HHW symbols.

Figure 91: HHW Symbols

Some of the items that should be brought to Household Hazardous Waste (HHW) roundups or to the Transfer Station are listed below:

- Abrasive cleansers
- Acetone
- All spray (aerosol) cans, including:
  - paints
  - hair sprays
  - air fresheners
- All-purpose cleaners
- Ammonia
- Ant and wasp spray
- Auto body filler
- Barbeque starters
- Bleach
- Brake and transmission fluid
- Butane refills
- Car waxes and polishes
- Carbon tetrachloride
- Contact cement
- Degreasers
- Disinfectants
- Drain cleaners
- Fabric softeners
- Floor wax strippers
- Fungicides
- Furniture polishes and waxes
- Glass cleaners
- Glues
- Hair coloring and hair perm solutions
- Insecticides
- Laundry stain removers
- Laundry starch
- Lighter fluid
- Lighters
- Liquid cleansers
- Lye

- Mildew removers
- Muriatic acid
- Nail polish and remover
- Oven cleaners
- Paint thinners and strippers
- Photographic chemicals
- Propane gas cylinders
- Rubbing alcohol
- Rug and upholstery cleaners
- Rust removers
- Septic tank degreaser
- Shoe, silver and brass polishes
- Spot removers
- Toilet cleaners
- Tub and tile cleaners
- Turpentine, varnish and lacquers
- Weed killers
- Wood preservative

4.4. Transfer Station Examples

Although the proposed Transfer Station for Sayisi Dene is called a "Transfer Station", as mentioned above, it actually functions as a Reception, Sorting, Storage and Transfer Station. This combined approach was developed because:

1. The population being served is considerably smaller than that served by many other Stations, making the combining of functions into a single facility appropriate.

2. Some of the Transfer Station Examples examined combine some of these functions in various ways.

This report treats the Transfer Station Examples examined as "lessons learned", to be applied to our project. Lessons can also be learned from other recycling locations in Manitoba, which can be found on the "Find Your Eco-Depot" map on the Government of Manitoba's Sustainable Development webpage[41].

4.4.1. ALTONA

Altona's facility deals only with recyclables, which are collected separately from non-recyclables in the community. It is used to receive materials, to sort, store and transfer recyclables out.

It is a very good example of how recyclables can be separated into the various recycling streams (each one often associated with a particular PRO or a place that will pay for the recyclable material). More information can be found on the Altona municipal website[42].

The Altona facility has a conveyor system from lifting material from ground level and depositing it on a raised separator system—when the recyclables are distributed on a moving belt (almost like an assembly line in reverse).

[41] http://www.gov.mb.ca/sd/wastewise/ecodepot.html?id=b4472af2470049d2861f14b55bfc0e85

[42] https://altona.ca/residents/community-and-social-services/recycling/

Figure 92: Conveyor and Raised Separation System at Altona Facility

A number of people are employed to separate selected recyclables[43] from the rest of the recyclables. They stand next to the conveyor and pull these specified recyclables off the conveyor. Depending on the item, they either put them into cardboard barrels behind them, or drop the materials into a chute, which deposits them into a pile below. Materials in the pile are then gathered together, baled, and shipped out for further processing.

Figure 93: Baler at Altona Facility

[43] These are typically recyclables for which the facility can get money.

Perhaps the primary lesson learned from the Altona facility is that recycling does not need to be a dirty or smelly process. With reasonable care, the facility can be a pleasant, tidy place to work.

4.4.2. BRANDON EASTVIEW LANDFILL SITE

A tour of the City of Brandon Eastview Landfill Site[44] was also very helpful.

This facility is large and does only a modest amount of recyclables sorting—separating out mainly paper and cardboard. It functions primarily as a storage and transfer station, baling comingled recyclables and shipping them out for further processing elsewhere.

Like the Altona recyclables facility, it has a raised recycling system.

Figure 94: Conveyor and Raised Separation Table at Brandon Facility

Although not as tidy as the Altona facility, the Brandon facility still achieves a significant amount of diversion. A single bale of crushed pop cans, for instance, can weigh more than a tonne.

[44] https://www.google.ca/maps/place/Eastview+Landfill+Site/@49.8381387,-99.8946482,17z/data=!3m1!4b1!4m5!3m4!1s0x52e79133e238f58b:0x66ade4fdbc530eb6!8m2!3d49.83813
53!4d-99.8924542

Figure 95: Bale of Crushed Pop Cans at Brandon Facility

A number of lessons can be learned from the Brandon facility that are particularly useful for Sayisi Dene.

4.4.2.1. Brandon Lesson 1 – Waste Oil Storage

The Brandon facility stores waste oil for later recycling or use to generate heat in waste-oil furnaces.

Figure 96: Waste Oil at Brandon Facility

The Brandon facility makes it clear that storage does not have to be complex, and can be safely done outdoors, if pallets and appropriate storage containers are used.

4.4.2.2. Brandon Lesson 2 - Loading

We can copy the process of loading palleted recyclables into semi-trailers.

Figure 97: Loading from the Transfer Station to a Semi-Trailer.

In Brandon, they use a forklift. In Sayisi, the Compact-Track Loader or the Pallet Jack will be used. A key piece of equipment in this photo—that is easy to overlook—is the ramp. This will be particularly necessary in Sayisi, as the height of the trailer will vary depending on the depth of the snow on the road beside the Transfer Station. As part of building the Platform for the Transfer Station, a small, adjustable Bridge will need to be built. When a trailer is backed up to the Platform, the Bridge will need to be put down to connect the Platform with the Trailer.

4.4.2.3. Brandon Lesson 3 – Value of Roll-On-Roll-Off Systems

The Roll-On-Roll-Off system can be versatile—and can be used as part of education and awareness-raising.

Figure 98: Roll-On-Roll-Off Truck, with Recycling Bin, in Brandon

This truck and recycling bin are notable for a number of reasons:

- School children were involved in painting the bin, increasing their awareness of recycling, and building a sense of connection between them and the recycling initiatives in their community. This effect will probably be stronger in Sayisi Dene, as the students who paint the bins will pass by them every day.[45]
- Lids on the bins can be useful for keeping out rain and snow.
- A bin system can be adapted for various volumes. This is a relatively large bin, on a fairly large truck. Smaller bins and a trailer (rather than a truck) are proposed for Sayisi Dene. If, at some point in the future, the volume of material being transported warrants a truck being purchased, the bins can still be used.

[45] The bin looks like it has multiple compartments. This isn't the case. It is a single bin.

4.4.3. RURAL MUNICIPALITY OF LOUISE

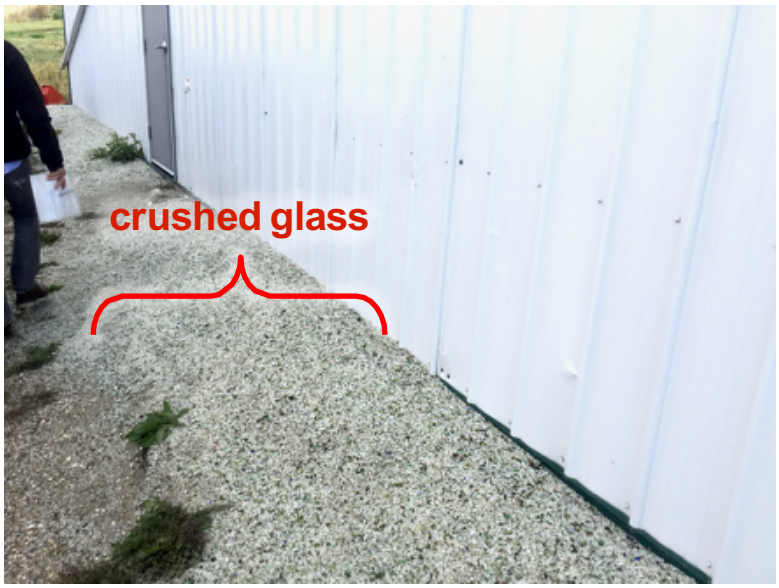
The RM of Louise (Pilot Mound) has an Integrated Waste Management Facility. This is one of the best waste and recycling management systems in Manitoba, for a number of reasons:

1. This facility deals with waste and recycling activities in:
    - one facility
    - managed by one department
    - with an integrated budget.
    - This integration does two crucial things:
        - It ensures cost savings
        - It greatly reduces the amount of material that ends up in the landfill
2. The sorting station is on the same level as the building floor.
    - This reduces capital costs.
3. Transfer facilities can be simple
    - See "Transfer Facility Between Ground & Semi-Trailers", below.
    - Although this looks simple, to be durable, it needs to be carefully designed and constructed. Note, for example:
        - A strong, well-built wood barrier, with posts sunk securely into the ground.
        - Sufficient, compacted gravel at both levels, and on the sloped roadway between them.
        - A culvert to drain away the water that would otherwise accumulate in the low area.
        - A level area nearby for shipping containers. Sayisi Dene would need a second area nearby for semi-trailers to be lined up.
        - The lack of any garbage or other materials stored nearby.
4. The final material left after waste diversion is shredded before it goes in the landfill.
    - This ensures that the material is easy to compact and cover. It also ensures that nothing that could be diverted makes it into the landfill.
5. Innovative recycling ideas are encouraged
    - For example, the facility has a small crusher that grinds up glass bottles. The material it produces (glass pieces approximately ¼" in size) is laid around the building in a strip about 1 yard wide. Rodents will not walk on this material because the sharp edges of the glass cuts their feet, resulting in an effective, no-cost rodent control system. (See "Crushed Glass Beside Building", below.)

6. The facility has an integrated leachate lagoon.
    - Leachate from the landfill—and water run-off from spraying down the floor of the building—are captured in a small, lined lagoon, where it can safely evaporate.

Figure 99: Transfer Facility Between Ground & Semi-Trailers in Louise

Figure 100: Crushed Glass Beside Building in Louise



Because the Sayisi Dene community's population is about ¼ that of the area served by the Louise facility, these lessons all need to be scaled down. But they are all valuable pointers for Sayisi Dene.

4.4.4. THOMPSON

Thompson has two locations that deal with recyclables—the Thompson Recycling Centre[51] and the City of Thompson's Waste Diversion Program at their Waste Disposal Grounds[52].

The Thompson Recycling Centre accepts rechargeable batteries, household recyclables ("Blue Box Materials"), waste oil and antifreeze. The Waste Disposal Grounds accept eWaste, appliances, metals, tires, and car batteries.

Perhaps the most important lesson learned from the Thompson facilities is the handling of compost. Although they accept only a limited range of compostables from the public (grass clippings and leaves), their facility demonstrates the necessity of including composting as part of a wholistic approach to waste and recycling.

4.5. Rockwood Transfer Station