



Ministerial Committee on Solid Waste

Recommendations for Action towards a Sustainable
Solid Waste Management System for Yukon

April 2018



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1.0. Executive Summary

The Ministerial Committee on Solid Waste (the Committee) is pleased to submit its final report to the Minister of Community Services (the Minister) for review. This report provides an evaluation, analysis and recommendations for Yukon's solid waste management system. Methods of evaluation and analysis included a community waste survey (*See Appendix I*) and a jurisdictional scan (*See Muniscope Jurisdictional Scan*), as well as utilizing historical, regional and national data to inform the Committee's recommendations.

The recommendations put forward center primarily on improving the current systems and creating efficiencies where possible. The *Executive Summary – Recommendations* table below provides a brief description of the Committee's prioritized recommendations with high level cost estimates for development of the required action plans or reports and/or implementing the action. These costs do not include existing (i.e. sunk) costs such as landfill liabilities, landfill closure costs or known operating costs. The theme throughout is to keep operating cost impacts to a minimum. These recommendations lead to a reallocation of existing costs with a focus on evidence based decision making. The committee finds that interim financing may be required by some municipalities to meet regulatory requirements such as groundwater monitoring. All data used to inform this report can be found in the appendices.

Results of the Committee's analysis show that while Yukon residents enjoy a high level of waste management services in many cases, the delivery of these services can generally be characterized as inconsistent and costly (on a per-capita basis) when compared to other jurisdictions in Canada.

This report finds that without changes to the ways in which waste management services are delivered in Yukon, there is significant risk to municipalities and the Yukon government in providing adequate and cost-effective waste services to residents in the long-term. The pressure of increasing costs, coupled with public and stakeholder demands for action, highlights the need for action.

1.1. Executive Summary - Key Findings

High Cost of Waste. Yukon currently has 14 unincorporated community landfills (three operated by Highways and Public Works, 11 by Community Services), five waste transfer stations (operated by Community Services), and eight municipally operated landfills, meaning Yukon operates 27 waste management facilities to serve 38,641 residents. The estimated operating and maintenance cost (not including landfill closure) of managing Yukon's waste streams which includes operating landfills, recycling depots and compost facilities, and transporting waste and recyclables is approximately \$10.5 million per year or \$275 per person per year (*See Appendix I - YG Costs*).

Rationalization of Services. Many jurisdictions have launched waste management strategies that have sought to improve their waste management facilities and services in rural and isolated communities. As a result of increasing awareness around environmental liabilities and the life-cycle cost of landfilling, landfills are being closed across Canada. Moreover, the majority of the landfills in operation in Yukon provide a wide-range of services and accept a variety of materials at little to no upfront cost to residents.

Regionalization. Several jurisdictions have opted to implement legislation that allows or facilitates regional cooperation for waste management. Three landfills in Yukon currently accept waste from areas outside their municipal boundaries through regional agreements: Dawson, Whitehorse and Watson Lake. Expanding upon this model for the rest of Yukon would provide support for regional (municipal) sites, while reducing the number of active landfills and associated long term environmental liabilities.

User Fees. The primary cost-recovery process for solid waste in Canada is currently taxation and utility fees. Growing regulatory requirements, increasing volumes of waste, and potentially toxic legacy waste has led to solid waste systems which can be considered underfunded. The Committee believes that adequately funding this system cannot be accomplished through transfer payments from the Yukon government alone. Users, industry, and governments, must pay a reasonable portion of the cost of the waste they generate if a sustainable system of management of solid waste is desired. In particular, this Committee believes that the timely implementation of the Designated Materials Regulation (DMR) is a critical action in relation to the financial sustainability of waste management.

Best Practices. The variety of ways in which solid waste is managed in Yukon presents a significant challenge in making improvements to the overall system. Implementing territory-wide service levels and new initiatives requires the support and buy-in of all of the operators and facilities. Solid waste systems have a great number of interdependences and to continually improve the system it is helpful for solid waste managers to be consistent in following best practices.

First Nations Participation in Solid Waste Management. Though many First Nations in Yukon do not have a role in waste management in the same way municipalities do, the Committee carefully considered the current and potential future role of First Nations. For example, the Committee sees significant economic development opportunities for both municipalities and First Nations in the regionalization of our solid waste system in handling and transporting solid waste. The Committee feels strongly that solid waste management is an issue which affects all Yukoners, including First Nations, and any solutions to be implemented should involve First Nations groups where possible.

Implementation Working Group. A collaborative approach to improving waste management practices throughout Yukon requires that the Yukon government work closely with all affected First Nations and municipalities throughout the implementation of the following recommendations. In order for this working group to have the authority and capacity to make the changes suggested in this report, specific roles will need to be identified and positions will need to be funded for the short to medium term. This can either be done in a formal agreement between governments or by providing a clear mandate and resources to Community Services.

1.2. Executive Summary - Recommendations

The Committee is recommending the following actions (*See pages 5 – 11 for detailed activities*):

| Theme | Recommendation | Timeframe | Priority ¹ | Capital Cost ² |
|------------------------|---|-----------------------------|-----------------------|---------------------------|
| Regionalization | Review waste management costs and service levels for unincorporated areas | Short (2018) | 1 | * |
| | Develop and implement a solid waste regionalization strategy and framework | Short to Medium (2018-19) | 1 | *** |
| | Develop a strategy for managing landfill liability responsibilities including legacy liabilities | Short to Medium (2018-19) | 1 | ** |
| User Pay | Implement DMR as expediently as possible and explore Extended Producer Responsibility (EPR) with industry | Medium to Long (2018-2022) | 1 | ** |
| | Implement a solid waste user fee pilot in Whitehorse periphery to explore potential user fees at all sites | Short to Medium (2019-20+) | 1 | ** |
| | Continue to support diversion credit program in the short term as DMR is implemented | Short to Medium (2018-19+) | 2 | * |
| | Implement a coordinated communications strategy promoting stewardship programs and practices in Yukon | Short (2018) | 2 | ** |
| Clear Standards | Establish a Solid Waste Implementation Working Group | Short (2018) | 2 | * |
| | Implement best practices for waste management facility operations | Medium (2019) | 3 | * |
| | Explore the role of social enterprise, entrepreneurship and local innovation in solid waste management across Yukon | Medium to Long (2019-2022+) | 3 | * |

1. Priority 1: (critical), 2 (important) and 3 (beneficial).

2. Capital Cost: - No cost, * (\$10,000 or less) to ***** (\$1,000,000 or more)

2.0. Recommendations

The recommendations included in this section represent the Committee’s deliverable as per the mandate given by the Minister and as outlined in the Terms of Reference. The recommendations encompass three broad priority areas of solid waste management, which are (1) Regionalization, (2) User pay, and (3) Clear standards.

The actions contained within each of these areas are grounded in the key findings of the Committee and based on the primary and secondary research undertaken. The actions utilize the SMART (specific, measurable, achievable, relevant, and time-based) principle for strategic planning.

2.1. Reading the Recommendations

The recommendations are formatted into tables for clarity and readability. Below is a description of each column and how it should be interpreted:

| Theme: This row describes the overarching priority area in which the recommendation/action fits | | | | | |
|--|--|--|--|--|---|
| Recommendation: This column describes the broad recommendation which the attached actions support | | | | | |
| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
| This column describes the specific action being recommended | This column describes the estimated timeframe to initiate the action | This column describes the estimated incremental costs to implement on a scale of * (\$10,000 or less) to ***** (\$1,000,000 or more) | This column describes what the anticipated deliverable of the specific actions | This column describes the broader purpose of the action and what goal is trying to be achieved by the action | This column describes who should likely be involved in the action. This does not indicate who would be leading the implementation nor is an exhaustive list |

2.2. Theme: Regionalization

The Committee’s vision for this theme centers on the efficient use of resources and support for enhanced municipal solid waste operations. The Yukon currently has 27 solid waste facilities, eight of which are municipally operated. Given the increasing pressure to mitigate environmental risk, improve monitoring and reduce waste management costs over the long term, it is essential that waste management facilities implement best operating practices and the number of active landfills in Yukon be managed.

Directing existing and new resources towards enhancing regional solid waste sites can help the Yukon government ensure that there is an appropriate level of service for the population served, as well as strategically prepare for the eventual closure of some solid waste facilities without a significantly reducing service.

Theme: Regionalization

Recommendation: Review waste management service levels for unincorporated areas

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|---|-------------------|------|------------------------|--|--|
| Review levels of service and costs for unincorporated solid waste facilities | Short Term (2018) | * | Report and Action Plan | Service levels are cost-efficient through rationalization of Yukon government solid waste sites as part of regional strategy Possible introduction of a user pay system at Yukon government solid waste sites | YG Municipalities LAC's First Nations |

Theme: Regionalization

Recommendation: Develop and implement a solid waste regionalization strategy and framework

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|--|--------------------------------|------|---|---|--|
| a) Develop and implement a solid waste regionalization strategy and framework which includes: operating boundaries, service levels, base infrastructure (gates, electricity, scales, monitoring wells etc.), best practices, and population based funding | Short to Medium Term (2018-19) | *** | Regional Waste Management Strategy and Framework | Defining criteria for regional solid waste sites Establishing evidenced based funding criteria for regional sites Implementation of regional agreements Identifying economic development opportunities for local governments, non-profits and private sector | YG First Nations Municipalities AYC Unincorporated Communities |
| Establish "Solid Waste Management for Northern and Remote" document as best practices for solid waste operations | Short Term (2018) | - | All waste managers adopt guidance document as applicable to the individual site | Best practices for solid waste are consistent at all sites across Yukon Environmental risk is minimized | YG Municipalities |

Theme: Regionalization

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|--|-----------------------|------|---------------------|---|----------------------|
| a) Develop a territorial understanding of landfill liability responsibilities and processes, including costs for monitoring wells, closure and post-closure costs. | Short Term (2018) | ** | Workshop and report | All municipalities and YG understand process and responsibilities should environmental contamination occur at a landfill General understanding of the costs and responsibilities with ongoing landfill liability | YG Municipalities |
| b) Determine historic use of all landfill sites in Yukon | Medium Term (2018-19) | * | Report | Determine if landfills were active prior to municipal operations in order to clarify responsibilities | YG Municipalities |

2.3. Theme: User Pay

The Committee’s vision for this theme centers on acknowledging the need for additional resources to address new and existing challenges. In some cases, there may be an adequate amount of resources directed to a particular asset or service, but it may not be being used efficiently. In other cases, there may not be an adequate amount of resources in place to deal with the issue at hand in the manner specified.

The Committee recognizes that a sustainable solution to funding solid waste operations requires a combination of approaches, including transfer payments, taxes and user fees. Increased funding for solid waste is necessary, but this funding should not come solely from Yukon government.

Theme: User Pay

Recommendation: Implement DMR as expeditiously as possible and explore EPR with industry

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|---|--|------|--|---|----------------------|
| Continue with a phased-in approach to implementation of designated materials regulations including items commonly identified as household hazardous waste | Medium to Long-term (2018/19 to 2020+) | ** | Inclusion of relevant materials in DMR as per YG commitment to CCME Canada Wide Action Plan on EPR | Increasing funding for Yukon waste management systems Ongoing support for already adopted CCME Action Plan Addition of key materials on the DMR list such as oil and waste oil containers | YG Municipalities |
| Examine and report on EPR feasibility in Yukon | Short Term (2018) | * | Report | Understanding the feasibility of EPR in Yukon | YG |

Theme: User Pay

Recommendation: Implement a solid waste user fee pilot in Whitehorse periphery and phase in fees throughout Yukon

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|---|----------------------------------|------|--|--|---|
| Initiate consultation with Whitehorse periphery on proposed fees | Short Term (2018) | * | Engagement and Action Plan | Understand public opinion of user fees at Yukon government solid waste sites in the Whitehorse periphery Develop a user fee pilot implementation plan | YG Unincorporated Communities Local organizations |
| Implement a solid waste user fee pilot project in the Whitehorse periphery | Medium Term (2019) | ** | User fees in place in Whitehorse periphery | Establish a user fee model to increase cost efficiencies Reduce waste flows to Whitehorse peripheral sites | YG Unincorporated Communities Local Organizations |
| Evaluate impact and based on results, determine potential for a territory-wide roll out | Medium to Long-Term (2019 to 20) | ** | Report and Action Plan | Determine the effectiveness of pilot including potential implementation of user fees at all municipal and YG sites | YG Municipalities Unincorporated Communities Local Organizations |

Theme: User Pay

Recommendation: Continue to support the diversion credit program in the short term and assess the program for accountability and financial sustainability

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|---|---|------|--------------------------------|--|--|
| Assess and modify the diversion credits program for accountability and financial sustainability | Short (2018) | * | Program review report | Accountable funding program in the short term | YG City of Whitehorse Recycling Processors |
| Ensure diversion credits are fully funded until such time that DMR offsets this funding system | Short to Medium-term (2018/19 to 2020+) | * | Strategy for diversion credits | Secure funding for processors in the short term until DMR is fully developed | YG Municipalities |

Theme: User Pay

Recommendation: Implement a coordinated communications strategy promoting stewardship programs and practices in Yukon

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|--|-------------------|------|---|--|---|
| Implement a coordinated strategy promoting stewardship programs, practices and innovation in Yukon | Short Term (2018) | ** | Ongoing collaborative Communications Strategy | Ensuring awareness of existing programs and practices Establishment of long term communications strategy around key solid waste initiatives | YG Municipalities Non-profits Business Sector Yukon College/Research Centre |

2.4. Theme: Clear Standards

The Committee’s vision for this theme centers on the ability for all solid waste operators and managers in Yukon to deliver services in a consistent manner and to become more efficient in the delivery of these services through standard approaches and use of best practices.

Through reviewing the results of the Committee’s 2017 Community Waste Survey, it became apparent that there are a number of disparities among communities and municipalities in how they deliver services, how those services are funded, and how the costs and services are tracked and accounted.

The Committee acknowledges the limitations of the Yukon government to impose new regulations on municipalities in how they operate solid waste facilities, so the recommendations and actions contained under this priority are based primarily in leadership, data collection and reporting, and promotion of best practices.

Theme: Clear Standards

Recommendation: Establish an Implementation Working Group

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|--|-------------------|------|---|---|---------------------------------------|
| Establish a Task Specific Implementation Working Group | Short Term (2018) | * | Establishment of task specific working groups | Ongoing oversight and guidance for the implementation of the report’s recommendations | YG Municipalities First Nations |

Theme: Clear Standards

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|--|--------------------|------|--|--|---------------------------------------|
| Standardize reporting practices for solid waste facilities | Short Term (2018) | * | All facilities separating waste costs by functional area | Solid waste managers are utilizing best practices to guide operations | YG Municipalities First Nations |
| Review the efficiency of the movement of solid waste and recyclables | Medium Term (2018) | * | Report | Evidence based decision making on the transportation of waste | YG Municipalities First Nations |
| Assess the production, transportation, processing and handling of non-refundable materials for the economic, social and environmental value | Short Term (2018) | * | Report | Clear understanding of the economic, social and environmental value of recycling | YG |

Theme: Clear Standards

Recommendation: Explore the role of social enterprise, entrepreneurship and local innovation in solid waste management in Yukon

| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
|---|-------------------------------------|------|-------------|--|---------------------------------------|
| Explore the role of social enterprise and entrepreneurship and local innovation in solid waste management in Yukon | Medium to Long-term (2019 to 2020+) | * | Report | Gaining an understanding of the potential of non-profits, private industry and mining sector and its roles in solid waste management | YG Municipalities First Nations |

2.5. Theme: Local Initiatives: Organics and Compost

| Theme: Local Initiatives | | | | | |
|--|-------------------|------|-------------|--|---------------------------------------|
| Recommendation: Continue to encourage compost programs to be developed and delivered at the discretion of communities | | | | | |
| Action | Timeframe | Cost | Deliverable | Outcome | Partners |
| Continue to encourage the development and delivery of local compost programs at the discretion of communities | Short Term (2018) | * | Nil | Enhanced local organics diversion programs | YG Municipalities First Nations |

3.0. Next Steps

In order to move forward with the recommendations in the report, the Committee recommends that an implementation working group be formed as soon as possible. Dependent on the recommendations selected for implementation, the implementation group can begin to work with various partners to determine project scope, budgets, resources needed, and so on, to ensure that initiatives are moving forward.

The Committee believes that working towards a robust, modern and sustainable territory-wide solid waste system is an iterative process that will require ongoing dialogue and participation of stakeholders. The implementation working group will be vital in ensuring we have the appropriate mechanisms in place for that feedback and communication.

Beyond forming an implementation group, next steps will depend on which recommendations the Minister feels are feasible to implement. Although the mandate of this Committee has concluded, there is high interest from members to continue this conversation and help support implementation.

4.0 Background

The Ministerial Committee on Solid Waste was struck in October of 2017 and tasked with developing recommendations to the Minister of Community Services on improving solid waste management in Yukon.

Members of the committee were as follows:

Ian Davis Co-Chair (YG), Bev Buckway Co-Chair (AYC), Ian Dunlop (AYC), Cam Lockwood (AYC), Cole Hunking (AYC), Bryna Cable (City of Whitehorse), Todd Powell (YG), Damien Burns (YG), Dave Albisser (YG).

The Minister provided initial guidance through a Terms of Reference and asked the Committee to provide their recommendations on the following:

- Developing a user fee pilot at YG and municipal waste management sites;
- Exploring improved HHW and waste oil collection programs/service levels;
- Exploring organics diversion and composting programs in communities;
- Exploring waste transportation and collection efficiencies; and
- Advising the Minister of Community Services on solid waste, specifically focusing on solid waste governance models, stewardship, funding models and service objectives.

Based on guidance from the Minister, the Committee established the following goals for developing this report:

- To produce a short and simple report with recommendations that are clear and easy to understand;
- To help quantify and provide context to the different solid waste systems in Yukon; To have a clear understanding of shared solid waste issues;
- To better define the roles and responsibilities of solid waste managers in Yukon;
- To help inform citizens on the true costs associated with operating solid waste services;
- To put forward pragmatic actions that support a structured and shared vision for waste management; and
- To provide recommendations that, as much as possible, work within existing resources.

The Committee approached all of its recommendations utilizing the vision of the previous 2017 Solid Waste Working Group. The vision of that group and this Committee is as follows:

“A standardized waste management system for the Yukon that is based on: shared responsibility for waste management and waste reduction; financial

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Solid waste management in Yukon has been an increasing topic of interest for governments over the past number of years. There has been an equivalent amount of resources and research directed towards understanding how Yukon can overcome some of its unique challenges in order to develop a sustainable and effective territory-wide solid waste system.

In order to provide context to the findings in this report, it is important to acknowledge the important and valuable work that has preceded the Committee’s recommendations. It is appropriate to say that the findings and recommendations of this Committee are a continuation of previous reports such as AYC’s *Solid Waste Management: Vision for a Sustainable Model for Yukon Communities* (2016) (See AYC Report) and Government of Canada’s *Solid Waste Management for Northern and Remote Communities* (2016) (See Government of Canada’s Report) (a full listing of resources utilized to inform the

Committee's recommendation can be found in the bibliography Appendix III). The Committee recognizes the work of these groups and this work has informed the recommendations of this report greatly.

To summarize, the findings of the aforementioned reports make similar recommendations for solid waste management in northern and remote communities. Vast land masses and relatively sparse populations distributed across these areas present significant challenges for effective management of solid waste. Collecting and processing waste efficiently and in a cost-effective manner is greatly dependent on volumes. As well, providing the infrastructure and human resources to meet current environmental regulations, while simultaneously providing a high level of service to residents, has become a significant task in Yukon.

Adding pressure to the need to develop solutions for solid waste in northern communities is that the operation, maintenance and eventual closure of landfills is only getting more expensive as time moves on. Yukon's relatively small tax base means that paying the full cost of landfill operations and closure under the current system, through the use of taxes or subsidies by the Yukon government, will likely never lead to a truly sustainable solid waste system. The research to date has concluded that funding sustainable landfill operations must include a robust user-pay component, including multiple revenue streams such as tipping fees, providing value-added services (e.g., household hazardous waste) and progressive systems such as the Designated Material Regulation (a stewardship model) and Extended Producer Responsibility.

The need to develop solutions is apparent and has been well articulated in past studies. It is important to note that the Committee wholly supports and recognizes the need for solutions and hopes that the recommendations contained in the balance of this report will move Yukon towards a more sustainable, effective and efficient solid waste system.

The methodology used to create this report was to analyze past research and customized survey data to quantify and contextualize the state of Yukon's current solid waste systems. Through this research and survey, the Committee's goal was to develop evidence-based recommendations which related directly to the present challenges being faced to solid waste managers and that could be implemented effectively and quickly. Throughout the process the Committee worked closely with municipalities (directly and through AYC) to ensure that relevant data were being sought and that it reflected the current realities of solid waste managers.

The Committee collected primary data through two sources: the *2017 Community Waste Survey (See Appendix I)* and *2017 Waste Management Jurisdictional Scan (See Muniscope Waste Management Jurisdictional Scan)*.

The 2017 Community Waste Survey asked a series of questions to municipalities regarding municipal waste management operations. Including landfilling, recycling, compost and household hazardous waste. The results of the survey were helpful in understanding the challenges of municipal solid waste operations, and more importantly, where those challenges aligned or diverged. The intent of the survey was to determine current costs and service levels in municipal waste management systems.

The 2017 Waste Management Jurisdictional Scan was undertaken by Muniscope for the Committee in order to better understand the various governance structures, service levels and funding models to waste management throughout Canada. Understanding the various solid waste regimes and how they are operated and funded provided valuable context for the Committee and ensured that all possible models were considered in the recommendations of this report.

APPENDICES

Appendix I – Community Waste Survey Results

| | Faro | Whitehorse | Carmacks | Watson Lake | Teslin | Haines Junction | Mayo | Dawson City | |
|---|-----------------|-------------------|--------------|-----------------|-----------------|------------------|-----------------|-----------------|--|
| General Info | | | | | | | | | |
| Population | 397 | 28,577 | 540 | 1464 | 514 | 909 | 499 | 2226 | <- Based on 2016 YBS census data |
| Number of Households | N/D | 5,850 | N/D | 374 | N/D | 262 (excl. CAFN) | 150 | 700 | |
| Tonnage (internal) | 280 | 17,709 | 486 | 755.6 | 390 | N/D | N/D | N/D | <- N/D - No Data |
| Tonnage (external) | 75 | 1,424 | 45 | 154.2 | 198 | N/D | N/D | N/D | |
| Annual Tonnage (approx.) | 360 | 19,133 | 496 | 910 | 488 | 818 | 449 | 2,003 | <- Where N/D (no data) available, total tonnage was calculated at .9T per year, per person |
| Waste Streams | | | | | | | | | |
| MSW | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | R = Recycling |
| C&D | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | PB/NP = Private Business/Non-Profit |
| Metals | Yes | Yes - R | Yes | Yes | Yes | Yes | Yes | Yes | |
| HHW, other toxics | No | Yes - PB/NP | No | No | No | Yes - R | Yes | No | <- Mayo checked both "landfill" and "not accepted" |
| Tires | Yes | Yes | Yes | Yes | Yes - R | Yes | Yes | Yes | |
| E-waste | PB/NP | Yes - R, PB/NP | Yes | Yes - R | Yes - R | Yes - R | Yes - R | Yes | |
| Recycling | PB/NP | Yes - R | Yes - R | Yes - R | Yes - R | Yes - R, PB/NP | Yes - R | Yes - R | |
| Organics | Yes | Yes | No | No | Yes - R | Yes - R | Yes - R | Yes | |
| Reuse Facility | PB/NP | No | Yes | Yes - R | Yes - R | Yes - R | Yes - R | Yes | |
| Vehicles | Yes | Yes - PB/NP | Yes | Yes | Yes - R | Yes | Yes | Yes | |
| Bulky Items (mattresses, etc) | Yes | Yes | Yes | Yes | Yes - R | Yes | Yes | Yes | |
| WMF Operations | | | | | | | | | |
| Is the Facility Gated? | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Facility Open Hours | Daily | Daily | MWFS 8am-7pm | Daily | Daily | Daily | Daily | Daily | <- Daily means 5+ days per week. |
| Is an Attendant present during working hours? | No | Yes | No | Yes | Yes | Yes | No | Yes | |
| Facility Attendant hours/wk | 0 | 80 | 0 | 80 | 40 | 40 | 0 | 40 | |
| Operator/Attendant Training (courses) | Landfill Ops | SWANA+ | SWANA | SWANA+ | None | SWANA | SWANA | SWANA | |
| Who maintains Facility? | Municipal | Municipal | Municipality | Municipal | Municipal | Municipal | Municipal | Municipal | |
| Annual WMF Operating Expense | \$ 78,704.11 | \$ 1,669,906.00 | \$ 94,243.00 | \$ 359,945.00 | \$ 136,150.00 | \$ 177,880.00 | \$ 215,940.00 | \$ 114,640.00 | <- Includes maintenance, wages, landfilling and operations expenses |
| Annual groundwater monitoring cost | \$ 15,200.00 | \$ 65,000.00 | \$ 17,100.00 | \$ 19,360.00 | \$ 12,300.00 | \$ 10,400.00 | \$ 16,100.00 | \$ 20,000.00 | <- Whitehorse includes this in the above WMF cost |
| Recycling Operations | | | | | | | | | |
| Cardboard | Yes | Yes | Yes | Yes | Yes | Yes | No | No | |
| Paper/boxboard | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | |
| Beverage containers | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Plastics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Tin | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Glass | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | |
| Non-Ferrous Metals | Yes | Yes | No | Yes | Yes | Yes | No | Yes | |
| Annual Recycling Operating Expense | \$ 6,193.00 | \$ 150,000.00 | \$ 27,000.00 | \$ 225,000.00 | \$ 37,000.00 | \$ 88,442.85 | \$ 88,970.00 | N/D | \$ 622,605.85 |
| Annual Recycling YG Contribution (Diversion Credits in Whse) | \$ 14,700.00 | \$ 612,692.00 | \$ 18,300.00 | \$ 40,800.00 | \$ 19,700.00 | \$ 31,500.00 | \$ 14,700.00 | \$ 40,800.00 | \$ 793,192.00 |
| | | | | | | | | | \$ 1,415,797.85 |
| Compost Operations | | | | | | | | | |
| Compost (Y/N) | Yes | Yes | No | No | Yes | Yes | N/D | Yes | |
| Annual Compost Operating Expense | \$ - | \$ 424,178.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | |
| Waste Collection | | | | | | | | | |
| Waste Collection Provided (Y/N) | Yes | Yes | No | Yes | Yes | Yes | No | Yes | |
| Annual Waste Collection Expense | \$ 12,666.51 | \$ 797,798.00 | \$ - | \$ 53,394.00 | \$ 15,500.00 | \$ 19,968.00 | \$ - | \$ 290,000.00 | |
| Waste Administrative Support | | | | | | | | | |
| Estimated Weekly Hours | 2 | 138.75 | N/D | 10 | 10 | N/D | 12 | 9 | |
| Annual Waste Administrative Cost | \$ - | \$ 348,743.00 | N/D | \$ 15,600.00 | \$ - | \$ - | \$ 21,840.00 | \$ - | |
| Landfill Closure Liability | | | | | | | | | |
| Annual Landfill Liability Cost | N/D | \$ 173,352.00 | \$ 18,000.00 | N/D | N/D | \$ 3,500.00 | \$ 36,000.00 | N/D | |
| Years of life left in current landfill | >50 | 35 | >50 | >50 | >50 | >50 | >50 | >50 | <- From MH 2013 Report |
| landfill reserve value | \$ 48,000.00 | | | | | | | | |
| Total Estimated Waste Management Expense | | | | | | | | | |
| Total Annual Estimated Expense | \$ (100,097.00) | \$ (2,163,379.00) | \$ - | \$ (414,445.00) | \$ (188,650.00) | \$ (270,002.85) | \$ (362,750.00) | \$ (378,912.00) | <- Dawson Data Inconsistent |
| <i>*note: As reported by communities; does not include waste collection costs. Waste collection costs are reflected in per capita calculations below.</i> | | | | | | | | | |
| Revenue Streams | | | | | | | | | |
| Operational Funding for Recycling Depot | \$ - | \$ - | \$ - | \$ 40,800.00 | \$ 11,400.00 | \$ - | \$ - | \$ - | |
| Total Annual Tipping Fee Revenue | \$ - | \$ 1,828,253.00 | \$ - | \$ 141,945.00 | \$ 5,700.00 | \$ 8,085.00 | \$ 1,000.00 | \$ - | |
| Total Annual Permit/Utility Fee Revenue | \$ 29,875.28 | \$ 537,302.00 | \$ - | \$ 88,100.00 | \$ 27,000.00 | \$ - | \$ 28,000.00 | \$ 166,347.00 | |
| Annual Regional Waste Facility Operational Funding | \$ - | \$ - | \$ - | \$ 75,000.00 | \$ - | \$ 31,500.00 | | \$ 95,000.00 | |
| Total Estimated Waste Management Revenue | | | | | | | | | |
| Total Annual Revenue | \$ 29,875.28 | \$ 2,209,290.00 | \$ - | \$ 380,845.00 | \$ 53,100.00 | \$ 99,585.00 | \$ 78,000.00 | \$ 261,347.00 | |
| Total Estimated Waste Management Surplus (Deficit) | | | | | | | | | |
| Total Annual Surplus (Deficit) | \$ (70,221.72) | \$ 45,911.00 | \$ - | \$ (33,600.00) | \$ (135,550.00) | \$ (170,417.85) | \$ (284,750.00) | \$ (117,565.00) | |
| <i>*note: does not include waste collection expense</i> | | | | | | | | | |
| Waste Management Cost /Capita | | | | | | | | | |
| Waste Management Cost /Capita | \$198 | \$58 | \$175 | \$246 | \$265 | \$196 | \$433 | \$52 | |
| Waste Collection Cost /Capita | \$32 | \$28 | \$0 | \$36 | \$30 | \$22 | \$0 | \$130 | |
| Annual Landfill Liability /Capita | - | \$6 | \$33 | - | - | \$4 | \$72 | - | |
| Recycling Cost /Capita (municipal funding only) | \$16 | \$5 | \$50 | \$154 | \$72 | \$97 | \$178 | - | |

Appendix I – Community Waste Survey Results (YG Figures)

Solid Waste Operational Costs to Yukon Government in Fiscal Year 2017/18

Note that the table below does not include recycling costs

| Location | Population* | Regular Maintenance | Site Attendant | Transfer Waste | HHW | Tipping Expenses | Groundwater Monitoring** | Maintenance Beyond Scope | Utilities | Other | Gasifier | Forecast Total | Waste Management Cost per Capita | Annual Landfill Liability*** |
|--------------------|-------------|---------------------|------------------|------------------|------------------|------------------|--------------------------|--------------------------|-----------------|------------------|-----------------|--------------------|----------------------------------|------------------------------|
| Silver City | 10 | \$0 | \$0 | \$15,610 | \$0 | \$15,403 | \$17,779 | \$0 | \$0 | \$0 | \$0 | \$48,792 | \$4,879 | \$7,395 |
| Keno | 20 | \$0 | \$0 | \$1,200 | \$0 | \$17,494 | \$28,248 | \$2,030 | \$0 | \$0 | \$0 | \$48,972 | \$2,449 | \$13,660 |
| Swift River | 20 | \$0 | \$0 | \$5,069 | \$0 | \$4,850 | \$23,500 | \$0 | \$0 | \$0 | \$0 | \$33,419 | \$1,671 | \$14,145 |
| Braeburn | 25 | \$0 | \$0 | \$18,356 | \$3,010 | \$17,494 | \$18,640 | \$550 | \$0 | \$0 | \$0 | \$58,051 | \$2,322 | \$7,644 |
| Johnson's Crossing | 25 | \$10,601 | \$0 | \$31,525 | \$0 | \$9,978 | \$22,800 | \$0 | \$0 | \$0 | \$0 | \$74,904 | \$2,996 | \$11,685 |
| Stewart Crossing | 30 | \$0 | \$0 | \$21,396 | \$3,437 | \$0 | \$21,483 | \$5,830 | \$0 | \$0 | \$0 | \$52,146 | \$1,738 | \$17,690 |
| Champagne | 50 | \$31,336 | \$60,580 | \$24,080 | \$12,884 | \$15,403 | \$17,779 | \$16,575 | \$253 | \$2,090 | \$0 | \$180,980 | \$3,620 | \$17,857 |
| Deep Creek | 70 | \$32,620 | \$51,075 | \$15,278 | \$15,965 | \$35,067 | \$25,285 | \$32,411 | \$278 | \$3,920 | \$0 | \$211,899 | \$3,027 | \$21,127 |
| Beaver Creek | 110 | \$60,352 | \$0 | \$0 | \$4,010 | \$0 | \$17,779 | \$4,000 | \$0 | \$1,841 | \$0 | \$87,983 | \$800 | \$25,632 |
| D-Bay/Burwash | 163 | \$19,550 | \$64,948 | \$23,875 | \$11,328 | \$15,403 | \$17,779 | \$5,330 | \$1,218 | \$3,372 | \$0 | \$162,803 | \$999 | \$19,513 |
| Old Crow | 259 | \$23,300 | \$192,500 | \$0 | \$0 | \$0 | \$62,993 | \$1,582 | \$27,262 | \$5,069 | \$26,720 | \$339,426 | \$1,311 | \$23,201 |
| Tagish | 264 | \$23,917 | \$60,568 | \$13,473 | \$24,359 | \$12,437 | \$21,191 | \$36,070 | \$2,782 | \$1,870 | \$0 | \$196,667 | \$745 | \$16,410 |
| Pelly Crossing | 390 | \$79,310 | \$0 | \$34,313 | \$12,872 | \$17,494 | \$24,825 | \$2,800 | \$0 | \$3,590 | \$0 | \$175,204 | \$449 | \$17,282 |
| Ross River | 395 | \$69,690 | \$51,777 | \$0 | \$3,750 | \$0 | \$21,794 | \$700 | \$479 | \$3,978 | \$0 | \$152,167 | \$385 | \$37,445 |
| Mount Lorne | 437 | \$104,760 | \$0 | \$5,005 | \$15,574 | \$23,037 | \$18,363 | \$18,539 | \$2,826 | \$1,870 | \$0 | \$189,974 | \$435 | \$15,420 |
| Carcross | 504 | \$23,317 | \$62,936 | \$35,485 | \$14,645 | \$35,583 | \$18,363 | \$48,562 | \$2,822 | \$3,370 | \$0 | \$245,082 | \$486 | \$22,629 |
| Marsh Lake | 696 | \$53,856 | \$147,125 | \$7,525 | \$54,771 | \$28,169 | \$18,363 | \$37,825 | \$8,387 | \$4,603 | \$0 | \$360,624 | \$518 | \$14,315 |
| Faro | 397 | \$0 | \$0 | \$0 | \$0 | \$0 | \$12,700 | \$0 | \$0 | \$0 | \$0 | \$12,700 | \$32 | \$37,655 |
| Mayo | 507 | \$0 | \$0 | \$0 | \$0 | \$0 | \$12,892 | \$0 | \$0 | \$0 | \$0 | \$12,892 | \$25 | \$27,379 |
| Teslin | 514 | \$0 | \$0 | \$0 | \$0 | \$0 | \$12,300 | \$0 | \$0 | \$0 | \$0 | \$12,300 | \$24 | \$42,460 |
| Carmacks | 548 | \$0 | \$0 | \$0 | \$0 | \$0 | \$13,399 | \$0 | \$0 | \$0 | \$0 | \$13,399 | \$24 | \$20,543 |
| Haines Junction | 914 | \$0 | \$0 | \$0 | \$0 | \$0 | \$10,261 | \$0 | \$0 | \$0 | \$0 | \$10,261 | \$11 | \$27,142 |
| Watson Lake | 1,471 | \$75,000 | \$0 | \$0 | \$0 | \$0 | \$29,040 | \$0 | \$0 | \$0 | \$0 | \$104,040 | \$71 | \$70,338 |
| Dawson | 2,229 | \$66,140 | \$0 | \$0 | \$0 | \$0 | \$19,896 | \$0 | \$0 | \$0 | \$0 | \$86,036 | \$39 | \$70,339 |
| Burwash | | | | | | | \$17,779 | \$850 | \$0 | \$0 | \$0 | \$18,629 | | \$6,703 |
| Canyon Creek | | | | | | | | | | | | | | \$10,276 |
| Horsecamp Hill | | | | | | | | | | | | | | \$4,124 |
| Upper Liard | | | | | | | | | | | | | | \$20,861 |
| Territory Wide | | \$0 | \$0 | \$14,300 | \$35,074 | \$0 | \$0 | \$21,753 | \$0 | \$76,217 | \$0 | \$147,344 | | |
| Total | | \$673,749 | \$691,509 | \$266,489 | \$211,678 | \$247,814 | \$525,231 | \$235,408 | \$46,306 | \$111,791 | \$26,720 | \$3,036,695 | | |

1 Population is estimated

*YBS Population Report, Third Quarter, 2017 OR 2016 Census, OR estimate

**Projections not actuals. Do not include ~75k for PM and ~25K for SARU travel

***Maximum 50 year landfill life. Morrison Hershfield 2013. Environmental Liability Assessment for Municipally Operated Landfills AND Morrison Hershfield 2017. Environmental Liability Assessment for Selected Yukon Government Landfills

Site closed

Municipality

Appendix II – Bibliography

Solid Waste Management for Northern and Remote Communities, Planning and Technical Guidance Document. March 2017. *Department of Environment and Climate Change Canada.*

Solid Waste Management: Vision for a Sustainable Model for Yukon Communities. January 2016. *Association of Yukon Communities.*

Getting to 50% and Beyond: Waste Diversion Success Stories from Canadian Municipalities. 2009. *Federation of Canadian Municipalities.*

Comprehensive Solid Waste Study for Yukon Territory Waste Facilities. August 2009. *EBA Engineering Consultants.*

State of Waste Management in Canada. 2014. *Giroux Environmental Consulting.*

The Road Map, Framework for Financial Implications of Reaching 50% Diversion by 2015 through Recycling in the Yukon. June 2012. *Kristina Craig Strategic Solutions with Bryna Cable.*

Waste Management in Northern and Rural Areas Across Canada. May 2017. *Muniscope.*