Agenda – Executive Policy Committee – December 5, 2018

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – November 22, 2018

Item No. 6 2017 Comprehensive Integrated Waste Management Strategy (CIWMS) Annual Report

STANDING COMMITTEE RECOMMENDATION:

On November 22, 2018, the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment concurred in the recommendation of the Winnipeg Public Service and submitted the following to Council:

1. That this report be received as information.

Agenda – Executive Policy Committee – December 5, 2018

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – November 22, 2018

DECISION MAKING HISTORY:

STANDING COMMITTEE RECOMMENDATION:

On November 22, 2018, the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment concurred in the recommendation of the Winnipeg Public Service and submitted the matter to the Executive Policy Committee and Council.

ADMINISTRATIVE REPORT

Title: **2017 COMPREHENSIVE INTEGRATED WASTE MANAGEMENT STRATEGY (CIWMS) ANNUAL REPORT**

Critical Path: **Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – Executive Policy Committee – Council**

AUTHORIZATION

Author	Department Head	CFO	CAO
Randy Park, Acting Manager of Solid Waste Services	Moira Geer, CPA, CA Director, Water and Waste Department	M. Ruta	D. Wardrop, Acting CAO

EXECUTIVE SUMMARY

The Annual Report to Council summarizes the accomplishments and financial results for 2017, as well as the plan and objectives set for 2018.

2017 was the fifth full year of implementation of the Comprehensive Integrated Waste Management Strategy (CIWMS) since beginning in 2012.

Program accomplishments in 2017 include:

- decreases to per capita garbage disposal of 5.9%
- opening of the second 4R Winnipeg Depot on Pacific Avenue
- increase of 4,800 tonnes in material managed at the 4R Winnipeg Depots
- expansion of the landfill gas (LFG) capture system at the Brady Road Resource Management Facility (BRRMF)
- construction of a new landfill disposal cell
- transition to new integrated collection contracts

RECOMMENDATIONS

That this report be received as information.

REASON FOR THE REPORT

On October 19, 2011, Council approved the Comprehensive Integrated Waste Management Strategy (CIWMS). Recommendation No. 28 of the CIWMS requires: “That the Winnipeg Public Service publish an annual report on the status of the Master Plan.”

IMPLICATIONS OF THE RECOMMENDATIONS

There are no implications associated with the recommendation of the report.

HISTORY / DISCUSSION

In 2009, Winnipeggers landfilled in excess of 283,000 tonnes of residential garbage, and recycled and composted approximately 54,000 tonnes of residential material, for a diversion rate of about 15%, one of the lowest in Canada. At the same time, the Public Service was recommending changes to the garbage and recycling collection systems based on feedback from collectors, industry trends and other municipalities in North America.

As a result, in June 2010, Council directed the Public Service to create a waste diversion strategy, with consultation from the public, to increase the waste diversion rate, explore options for material collection and provide uniform service for the citizens of Winnipeg. Working with a consultant and through extensive public consultations, a made-for-Winnipeg plan was developed.

OurWinnipeg also identified the need to carry out a comprehensive waste management strategy, to integrate and optimize the service level and efficiency of all facets of the solid waste management system, while minimizing environmental impacts.

On October 19, 2011, Council approved the Comprehensive Integrated Waste Management Strategy (CIWMS) with the overall strategy of the plan being to increase Winnipeg's diversion rate to 35% by 2016 and to greater than 50% by 2020 and thereafter. Implementation of the plan began in 2012.

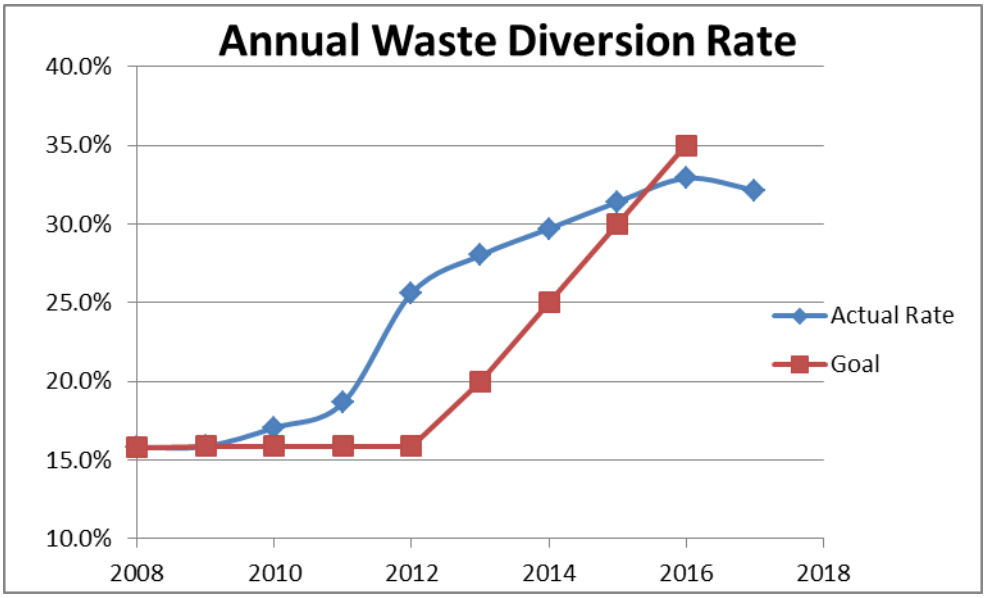
Program Accomplishments – 2017

1. Residential Waste Diversion

The overall diversion rate held fairly steady in 2017, with a drop from 32.9% in 2016 to 32.1% in 2017. This was due to a decline in the amount of leaf and yard waste (LYW) collected in 2017 as a result of a very dry year.

The waste diversion rate is calculated as a percentage of the total diverted residential tonnage divided by the total residential tonnage of material landfilled and diverted. The following chart shows the near-term waste diversion goals (2012 to 2016) established by CIWMS, as well as the actual rate since 2008. The decrease in 2017 is primarily attributed to low precipitation which resulted in a decline of LYW tonnages. The near-term residential waste diversion rate goal of 35% originally set by Council in 2011, will be reviewed as part of the 5-year CIWMS review taking place in 2018.

The total amount of waste managed per capita decreased by 6.4%, with the amount of residential waste declining from 285,000 tonnes in 2016 to 271,800 tonnes in 2017 (4.6% decrease). During this time, Winnipeg's population grew from 735,400 people in 2016 to 749,500 people in 2017, an increase of 1.9%.



2. Waste Disposal

Waste generation is an indicator of system performance and provides additional context to the waste diversion rate. On a per capita basis, 2017 showed significant improvement over 2016 except for LYW composting, which was heavily influenced by low precipitation. From 2016 to 2017, per capita, garbage generation decreased by 5.9%, recycling decreased by 1.4%, and composting decreased 18.0%. Notably, per capita garbage generation has decreased 20.2% since 2011.

Residential Waste Disposal per Capita (KG)

	2011	2016	2017	2017 vs 2011
Population[1]	677,800	735,400	749,500	+10.5%
Garbage - Total	309.44	262.32	246.85	-20.2%
Recycling - Total	67.62	78.95	77.86	+15.1%
Leaf & Yard Waste Composting - Total	13.54	46.24	37.91	+180.0%

3. Recycling Program (Curbside and Community Recycling Depots)

The total amount of residential recycling cart type material collected from all City of Winnipeg programs decreased by 1.3% (716 tonnes) in 2017. Per capita, the weight of recyclable material collected at the curb decreased by 3.3% and the amount collected at depots decreased by 4.8%

The decrease in the weight of recyclable material collected in 2016 and 2017 likely reflects ongoing changes occurring in the recycling industry. Known as the “evolving tonne,” recyclable

[1] Population figures have been restated from the 2016 Annual Report using the City of Winnipeg population estimate, March 2018 (http://winnipeg.ca/cao/pdfs/population.pdf)

material is shifting in composition away from heavier and denser material (e.g. glass, metal, and newsprint) to lighter and bulkier material (e.g. plastic, corrugated cardboard).

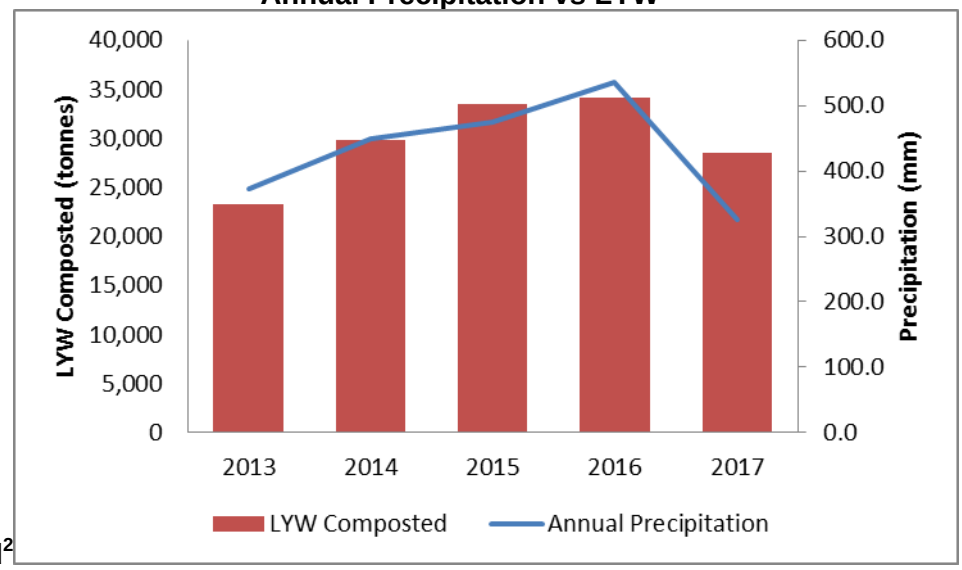
Year	Tonnes Recyclable Material Processed	Program Status
2017	54,177	5th full year of new program
2016	55,010	4th full year of new program
2015	55,697	3rd full year of new program
2014	54,465	2nd full year of new program
2013	53,606	1st full year of new program
2012	48,087	Partial year of new program
2011	45,835	Original program

4. Leaf and Yard Waste Collection and Composting

From 2016 to 2017, the amount of residential material collected for composting decreased by 17.4% (5,600 tonnes). Per capita, the decrease was 17.5% for curbside collection and 19.8% for self-haul.

While the drop in leaf and yard waste (LYW) tonnage from 2016 to 2017 is significant, it is not unreasonable given the dependency of this material on weather. The following chart shows a correlation between the annual precipitation and the amount of LYW collected for composting annually. Lower precipitation would result in a lighter and drier LYW material being collected (e.g., dry leaves vs wet leaves).

Annual Precipitation vs LYW Composted[2]



Collection and Self-Haul

More than 21,900 tonnes of yard waste was collected curbside and over 6,500 tonnes of LYW were dropped off at the 4R Winnipeg Depots and directly to the yard waste composting area at

[2] Based on historical data from Environment and Climate Change Canada, Weather Station: Winnipeg A CS

the BRRMF. Another 115 tonnes of material were delivered from other public sources, including the City's Retention Pond Weed Harvesting Program.

Composting

In 2017, over 28,500 tonnes of LYW waste was composted at the BRRMF. This represents a 16.4% decline from 2016. The finished compost continues to meet the standards established by the Compost Quality Alliance and the Canadian Council of Ministers of the Environment. In 2017, finished compost was primarily used as top dressing on finished areas of the landfill and provided to other City departments. 5,000 m^3 of compost was sold as surplus goods and, in celebration of Earth Day, a compost giveaway was held on April 22 at the Pacific 4R Winnipeg Depot. Approximately 100 cubic metres of compost was distributed at the event.

Year	LYW Tonnes Composted	Program Status
2017	28,528	5th full year of new program
2016	34,123	4th full year of new program
2015	33,474	3rd full year of new program
2014	29,754	2nd full year of new program
2013	23,223	1st full year of new program
2012	10,081	Partial year of new program
2011	6,598	Original program

5. 4R Winnipeg Depots

The second 4R Winnipeg Depot opened on Pacific Avenue in January 2017. Combined, the Brady and Pacific 4R Winnipeg Depots managed over 8,800 tonnes of material, a 120% increase over the amount managed in 2016 by the Brady 4R Winnipeg Depot. Approximately 110,000 vehicles visited the depots in 2017.

Of the 8,845 tonnes of residential material managed in 2017, 6,318 tonnes were diverted into recycling or composting programs. The remaining 2,527 tonnes collected at the depots consisted of clean fill[3] which was used throughout the BRRMF for daily operations.

The increase in the amount of material managed can be attributed to the opening of the second depot on Pacific Avenue in February 2017 and to the facilities becoming more popular and familiar to residents.

Tonnes of Material Managed at 4R Winnipeg Depots

Material	2016	2017	Material	2016	2017
Batteries	24	33	Glass	45	71
Bicycles	13	11	Lumber	187	185
Ceramics and Concrete	1,160	1,803	LYW	695	2,140
Clean Fill	338	2,527	Appliances	66	111
Electronics	375	530	Recyclable Material	171	296
HHW[4]	303	341	Scrap Metal	532	619

[3] Clean fill typically consists of clay or soil. These are materials that are not originally intended for disposal and therefore not considered diverted material.

[4] Household Hazardous Waste

Material	2016	2017
Oil	22	32

Material	2016	2017
Tires	58	146
Total	**3,989**	**8,845**

6. Residential Curbside Garbage Collection and Disposal

The weight of residential garbage collected[5] at the curb and landfilled decreased by 1.2% (2,071 tonnes) in 2017 despite a population growth of 1.9%. This is consistent with the improvements to waste diversion expected with the expansion of the 4R Winnipeg Depot program and continued maturity of existing waste diversion programs.

The chart below shows that garbage collected and landfilled in 2017 over 2011 has decreased by 37,532 tonnes (17.9%).

Year	Residential Curbside Garbage Tonnage	Program Status
2017	172,209	5th full year of new program
2016	174,280	4th full year of new program
2015	177,845	3rd full year of new program
2014	176,011	2nd full year of new program
2013	173,897	1st full year of new program
2012	201,741	Partial year of new program
2011	209,741	Original program

Reports of Abandoned Waste decreased by 51% and requests to 311 for Large Item Pickups increased by 4% in 2017 compared to 2016. The number of residents using the Extra Garbage Pickup service has steadily decreased.

Requests to 311	2017	2016	2015
Abandoned Waste reports	841	1,708	2,559
Large Item pickup[6]	13,098	12,636	13,561
Extra Garbage pickup	395	512	825

7. Curbside Collection Performance

The overall number of garbage, recycling, and LYW collection deficiencies increased from 2016 to 2017. In October 2017, the integrated solid waste contract for automated garbage, automated recycling, and yard waste collection transitioned to two new contractors, GFL Environmental Inc., and Miller Waste Systems Inc.. An increase in the number of deficiencies in the last quarter of 2017 coincided with the transition of collection contractors in October 2017. After an initial learning period for the new contractors in October, the number of reported service deficiencies has declined significantly.

[5] Includes a small amount of waste from municipal facilities and small commercial generators
[6] Includes pickups of bulky waste and appliances with ozone depleting substances

Collection	Approximate No. of Locations Collected Weekly[7]	311 Reports of Missed Collection		
		2017	2016	2015
Garbage carts	201,100	17,724	13,200	13,668
Recycling carts	201,100	15,524	11,338	15,066
Yard waste (April to November)	100,550	10,326	5,183	9,048
Total	-	**43,574**	**29,721**	**37,782**

Note: The total number of reports of missed collection may not be a true indication of contractor performance and penalties. For example, upon investigation by either the City or the contractor, a number of complaints registered as missed collection show:

- there was a valid reason why collection was not done
- the call should have been recorded as a different type of service request

8. Biosolids Composting and Soil Fabrication

In 2017, 5,240 tonnes of biosolids were composted, representing 10% of the 2017 tonnage of biosolids produced by the city. This is more than double the biosolids composted in 2016. Many of the issues that occurred in 2016, such as equipment failure and challenges of composting in extreme cold were addressed. The composted material is being used as part of the final cover at the BRRMF.

A biosolids soil fabrication pilot project at the BRRMF started in March 2017. The goal of the project was to assess the use of biosolids and other locally available residual material (e.g., wood waste) to fabricate topsoil suitable for use as final cover on closed landfill cells. The project was successful in demonstrating the potential to fabricate soil from local residual material and diverted approximately 800 tonnes of biosolids. This pilot project will be complete in fall 2018.

9. Lime Mud Berm Construction

In mid-December 2014, work began to build a new berm along the boundary of the BRRMF. Work on the berm continued in 2017 and final landscaping, which will include native grasses and trees, should be completed by fall 2018. This will provide an aesthetically pleasing boundary along Brady Road, the Perimeter Highway and Waverley Street.

The berm is constructed of lime mud, a natural by-product of the sugar refining process from a former Manitoba sugar beet processing plant. This initiative benefits the landfill, neighbouring properties and the environment by:

- reusing hundreds of thousands of cubic metres of material that would otherwise be landfilled
- helping to buffer visibility of the landfill

[7] As of December 2017

- generating surplus clay material (excavated for the berm), that can now be used as landfill cover for existing and future landfill disposal cells

10. Landfill Gas Capture/Green House Gas Reduction

In its fourth full year of operation, the landfill gas (LFG) system at the BRRMF captured and flared 12.4 million cubic metres of gas, resulting in a GHG reduction equivalent to 85,819 tonnes of carbon dioxide. The 2017 amount is equivalent to avoiding the carbon dioxide emissions of 18,377 passenger cars[8]. This is a 17.8% decrease from the amount captured in 2016 (104,349 tonnes). The decline in LFG production was anticipated due to the age of the system, as gas production from decomposing waste typically peaks within the first few years of disposal then gradually declines over the next several decades. An expansion of the LFG wellfield to newer disposal areas was commissioned in October 2017, but the performance of the new wells is not expected to meet their full potential until 2018.

11. Public Engagement

The Community Liaison Committee for the Brady Road Resource Management Facility, established in 2014 as part of the requirements of the new Environment Act Licence, had two meetings in 2017. Committee members provided advice on:

- a plan for landscaping finished areas of the landfill
- a plan for monitoring noise and odour
- ways to reduce the impact of landfill activities (e.g., construction, operations) on the local environment

The Waste Diversion Advisory Committee did not meet in 2017, as the Department is undergoing a review of the CIWMS. The committee will resume once the review is complete and has been presented to Council.

12. Financial Results

City Council's adoption of the CIWMS also included the introduction of the annual Waste Diversion Fee. Effective January 1, 2017, this fee was charged at an annual rate of $57 (2016 - $56) per dwelling unit to residential properties (properties with seven or less dwellings as defined by the Solid Waste By-law). These monies are used to fund waste diversion programs. The total revenue collected in 2017 was $11.3 million, comparable to $11.4 million in 2016 (adjustments processed in 2016).

Operating Cost Highlights

Contract Costs (in Millions)	2017	2016	2015
Garbage Cart Collection[9]	$9.1M	$7.7M	$7.5M
Recycling Cart Collection[10]	$6.7M	$4.5M[11]	$4.7M[10]
Recyclable Material Processing	$8.2M	$7.8M	$7.6M
Leaf and Yard Waste Collection	$2.8M	$3.0M	$2.9M
Leaf and Yard Waste Composting	$1.2M	$0.9M	$0.9M

[8] Based on USA Environmental Protection Agency Greenhouse Gas Equivalencies Calculator
[9] Excludes multi-family properties that use garbage bins
[10] Includes multi-family properties that use recycling carts
[11] Restated from 2016 and 2015 Annual Reports as it included front-end recycling bin collection

Collection Costs
The costs for cart collection have increased with the new residential solid waste collection contract (RFP No. 302-2016) as they reflect current markets rates for service. The 2017 costs for recycling cart, garbage cart, and LYW collection reflect nine months of the previous contract and three months of the new contract. All reported collection costs are net of penalties.

Processing and Marketing of Recyclable Material
In April 2017, Council approved single source negotiations to extend the current contract (Tender No. 162-2002) for the processing and marketing of recyclables from September 15, 2017 to September 30, 2019. The extension was finalized in June 2017.

In addition, Council approved a further increase to the contract for the processing and marketing of recyclables of September to December 2017, due to more stringent quality standards required for the old newspapers and mixed paper collected in City recycling programs. Approximately 70% of this finished material generated in Winnipeg (and in North America) is exported to the markets in China. Due to new quality standards enforced by the Chinese government, the quality specifications for these products have become more stringent resulting in increased sorting costs.

Carts
The department spent $700,836 for the purchase of garbage and recycling carts for new housing developments and for the replacement of damaged carts.

Waste Diversion Reserve Fund
A summary of financial results include (in millions):

Annual Waste Diversion Fee		$11.30 M
Waste Diversion Grants		$13.20 M
	Total Revenue	$24.50 M
Program costs		$23.50 M
Transfer to Waste Diversion Reserve		$ 1.00 M
	Total	$24.50 M

Waste diversion initiatives are funded through the waste diversion fee and third party grants. In 2017, waste diversion grants were received from third parties in the amount of $13.2 million.

Total program costs for 2017, including amortization, debt, salaries and allocated departmental costs, were $23.5 million, resulting in a transfer to the Waste Diversion Reserve Fund of $1.0 million.

At December 31, 2017, the balance in the Waste Diversion Reserve was $7.2 million. This balance will be used towards funding future waste diversion initiatives.

Capital Costs

4R Winnipeg Depots

- The 4R Winnipeg Depot located at the BRRMF opened in February 2016 and was completed at a cost of $5.13 million. The Pacific Avenue 4R Winnipeg Depot opened in January 2017 and has an estimated final cost of $4.85 million. The Panet Road site was under construction in 2017 and has an estimated final cost is $4.58 million.

Organics and Waste Characterization Study

- The development of the Organics Diversion Strategy and Waste Characterization Study started early 2015. The Waste Characterization Study was completed in 2016, while work on the Organics Diversion Strategy was concluded in 2017 and will be incorporated into the CIWMS review. The total cost of this project was $271,000.00.

Multi-Family Dwelling Waste Diversion Strategy

- The development of a Multi-Family Dwelling (MFD) Waste Diversion Strategy started in June 2016 and has been placed on hold pending the completion of the CIWMS 5-year review. The anticipated total cost of this project is $221,000.00.

BRRMF Site Improvements

- Improvements are required at the site of the BRRMF under the site's Environment Act Licence. The design of the primary roadway (Charette Road) and associated drainage took place in 2017 with construction scheduled for 2018. The approved Capital budget for this project is $2.8 million. An additional $55,000.00 was spent on hydro-seeding in 2017.

BRRMF Administration Building

- The tender to construct a new administration building for the BRRMF at 1777 Brady Road was awarded in September 2017. Completion of the building is expected in the first quarter of 2019 at an estimated cost of $2.9 million.

Landfill Gas

- Expansion of the landfill gas capture system started in 2017 with the drilling of 21 wells and installation of 3,500 metres of piping at a cost of $1.36 million. Additional work is schedule for 2018 to complete the expansion. The anticipated total cost of the project is approximately $1.5 million.
- The City will continue to assess the feasibility of converting landfill gas to energy with its partners. $200,000.00 was approved in the 2016 Capital Budget for this project.

BRRMF – Master Infrastructure Plan Development and Cell Design and Construction

- A study is underway to develop an infrastructure master plan for the BRRMF. This includes placement of future disposal cells, roadways, and leachate and landfill gas infrastructure. An updated lifespan estimate and clay balance of the site will also be developed. The infrastructure master plan will be completed in 2018. The contract also includes engineering design and construction administration services for the next three disposal cells over the next five years. The anticipated total cost of this project is $900,000.00.
- The construction of Disposal Cell 31 took place from July to December 2017, at a final cost of $3.2 million. This cell will provide an estimated 24 months of additional disposal capacity. Construction of the centralized leachate tank-associated infrastructure began in July 2017 and is expected to be completed by July 2018. The estimated cost of the leachate tank and associated infrastructure is $2.25 million.

Leachate Treatment Study

- A study was conducted to identify treatment options for leachate generated at the BRRMF and the three closed landfills with leachate collection systems (Summit, Kilcona and Saskatchewan Avenue Dump Site). The total cost of this project was $118,000.00. Recommendations in the study are being evaluated by the Water and Waste Department team and a business case to advance our leachate management practices will be completed in 2019.

13. 2018 Implementation Plan

CIWMS Review and Organics Diversion Strategy

The five-year review of the CIWMS has been mandated by Council. The review will assess CIWMS's goals and timelines, including whether they are appropriate and sustainable. The review will also address Council's April 2016 motion on organic waste and effectiveness of service delivery. A Request for Proposals (RFP, No. 10-2017) to conduct the review was posted in September 2017 and awarded in October 2017 to HDR Corporation. The Department will report back to Council on the review in 2019.

In-House Multi-Family Garbage Collection Pilot Project

On February 22, 2018, Council directed the Department to conduct a two-year pilot project of multi-family garbage collection using City staff. The Department will work collaboratively with CUPE Local 500 and others to implement the pilot project, which is scheduled to begin in 2020.

Processing and Marketing of Recyclable Material

The current contract for the processing and marketing of recyclable material expires September 30, 2019. An RFP (No. 767-2017) was posted in 2017 for the processing and marketing of recyclable materials from October 2019 to July 2029. The RFP closed in January 2018 and was awarded by Council in April 2018. The Department will be working with the successful proponent throughout 2018 and 2019 to ensure the implementation of this contract.

Compost Use Plan

A plan has been developed to allocate finished LYW compost generated at the BRRMF. Finished compost from LYW is primarily used within the BRRMF as part of the final cover layer. Additional LYW compost is provided to other Departments for their use (e.g. parks, riverbank stabilization), and to residents for educational and outreach purposes (e.g. International Compost Awareness Week, etc.). Any surplus will be sold in accordance with City policy. Biosolids compost is not permitted to leave the BRRMF per the Environment Act licence and is used by operations within the site.

Biosolids Soil Fabrication Pilot Project

A pilot project will continue to divert biosolids and other materials to fabricate topsoil for use as final cover. After a successful trial at the BRRMF, the next phase of this project will take place at Summit Landfill and will coordinate with Public Works to utilize street sweepings and wood waste generated by their operations. This project aims to demonstrate the safe and effective use of biosolids in this manner, providing an additional long-term beneficial use option for biosolids.

Landfill Gas
Expansion of the landfill capture and flaring system began in 2017 to include 21 additional wells and is expected to continue in 2018. The Department is collaborating with Manitoba Hydro to jointly study and assess the feasibility of beneficial reuse of landfill gas.

BRRMF Site Improvements
The Charette Road Renewal project at the BRRMF consists of the re-construction of the road base and application of an asphalt surface, as well as re-establishing grades in the drainage ditches on both sides of the roadway. The Bid Opportunity for this project closed on March 14, 2018; the work is expected to be completed by fall 2018.

Communication Strategy
The City will continue to use a multi-pronged approach to communicate its recycling and garbage programs and services, as well as its waste reduction/diversion efforts. Examples of different communication activities include:

- Providing new dwellings with a reusable bag which contains an information package on new collection services, and two sample paper yard waste bags
- Using summer students to educate residents through home visits during the summer months
- Participating in public events, such as the Winnipeg Home and Garden Show
- Continued public education through social and traditional media (newspaper, radio ads, community newsletters)

FINANCIAL IMPACT

Financial Impact Statement

Date: November 6, 2018

Project Name:

2017 Comprehensive Integrated Waste Management Strategy (CIWMS)
Annual Report

COMMENTS:

2017 financials are reported for information. Known and estimated future year costs have been incorporated in budget submissions

"Original signed by L. Szkwarek, CPA, CGA"

js
10-May-18

Lucy Szkwarek, CPA, CGA
Manager of Finance and Administration

CONSULTATION

In preparing this report there was consultation with:

N/A

OURWINNIPEG POLICY ALIGNMENT

This report is in accordance with the OurWinnipeg policies through

OurWinnipeg Reference: Section 02-2 Environment – “set long range goals for solid waste diversion”

SUBMITTED BY

Department: Water and Waste
Division: Solid Waste Services
Prepared by: Justin Lee, MCIP, RPP; Melissa Bunkowsky, CPA, CGA
Date: November 6, 2018
File No.: G-101