**April 13, 2017**

**To: Recycling & Energy Board Facility Committee
From: Joint Leadership Team (JLT)
Re: Technology Improvements to the R&E Center**

Ramsey and Washington Counties, first through the Resource Recovery Project, and more recently through the Recycling and Energy Board, have continuously evaluated technologies related to waste processing (Attachment A). Since 2013, the R&E Board has been assessing how new or different technologies can help achieve the scope for resource management (See Appendix B). The current focus of the R&E Board’s work has been narrowed to evaluating how to integrate mixed waste processing (MWP) technology into the R&E Center, how to develop markets for organic materials through anaerobic digestion, and for refuse-derived-fuel (RDF) through gasification.

**Integrating MPW and Developing Anaerobic Digestion Markets**

The work on new technologies can be viewed as having four steps. The diagram below, *Pathway to MWP,* shows how the R&E Board is currently at step three, “*Identify the Preferred MWP Solution*,” in its analysis. The *Pathway to MWP* describes the decision making process to help the R&E Board Facility Committee and R&E Board move through the phases of analysis into operations. The remaining analysis work in steps 3 and 4 are focused on addressing the outstanding engineering, legal, finance and policy considerations and how the R&E Board can move onto step four, Implementation.

**Pathway to MWP**

**Steps 3 and 4: Key activities and timeline**

Steps 3 and 4 of the pathway to MWP starts by defining and designing a MWP system that meets the R&E Board’s needs by taking the knowledge gathered during the last several years to produce:

* Preliminary design alternatives;
* Specific recycling and organics recovery goals desired by the R&E Board;
* Clear understanding of the financial return on investment, costs of alternatives, and social and environmental impacts of this decision;
* Organics management solutions that meet East Metro specific needs and economic constraints;
* A time-sensitive and appropriate solicitation tool for procuring technology solutions; and
* A clear path to financing MWP and related improvements.

This analysis is estimated to take 18 months to complete. At the end of 18 months, a MWP technology solution will ready for R&E Board consideration. The timeline for procurement release, construction and full operations will depend greatly upon the scope of the MWP technology solution desired but is estimated to take another 18 months for financing, procurement, and contracting, with an additional 2 years for construction and testing.

The proposed Pathway to MWP has a desired full operation target date of October 2022. The table below outlines key dates and activities.

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| --- | --- | --- | --- |
| ACTIVITY | START | END | NOTES |
| Analysis Completion | 4/1/2017 | 10/1/2018 | Target date for engineering, financial, legal and policy analysis completion and explore legislative opportunities [18 months] |
| MWP Pathway and Financing Selection | 4/1/2017 | 2/1/2019 | Target date for R&E Board approval of MWP pathway and financing mechanism(s) [+ 4 months] |
| Design Build Procurement Release | 4/1/2017 | 5/1/2019 | Target date for identifying how to issue Design Build Procurement, legal and financial issues addressed, other vendors as needed [+ 3 months] |
| Design Build Contractor/Vendors Selected  | 5/1/2019 | 10/1/2019 | [+ 6 months] |
| Construction Mobilization | 10/1/2019 | 1/1/2020 | [+ 3 months] |
| Construction | 1/1/2020 | 9/1/2021 | [+ 18 months] |
| Testing | 9/1/2021 | 3/1/2022 | [+ 6 months] |
| Full Operations | 3/1/2022 | 10/1/2022 | Reach full operations  |
| Outreach and Education | 4/1/2017 | 10/1/2022 | Community and key stakeholder engagement, communications with possible partners including vendors [Ongoing] |
| Transfer Station Engagement | 4/1/2017 | 10/1/2022 | Ongoing engagement with transfer stations on their role in organics separation [Ongoing] |

**Gasification**

Gasification is an emerging technology for converting Refuse Derived Fuel (RDF), aka shredded trash, to a bio-based fuel or chemical using intense heat. The R&E Board is looking to procure gasification services from a private sector end-market vendor. Several key elements have been completed to assist the R&E Board in identifying and vetting a private sector gasification vendor including:

* Issuing a Request for Expressions of Interest in September 2014 to better understand the commercial viability of gasification technology and its ability to integrate within the East Metro system;
* Visiting reference facilities; and
* Engaging in on-going conversations with multiple vendors.

Note: In the startup phases, gasification would use some but not all of the shredded trash currently being combusted by Xcel Energy plants. During the next 5 years, RDF produced at the R&E Center would continue to be transported to Xcel Energy plants in Red Wing and Mankato for combustion. The goal of finding a gasification vendor would be to phase out RDF combustion and move solely to RDF gasification over a set period of time. More than one gasification vendor could be a partner/RDF user.

**Key activities and timeline**

The next step for the R&E Board in its pathway to Gasification include:

* Ascertaining the engineering specifications and volume of RDF needed for gasification and any changes needed to be made at the R&E Center;
* Identifying an appropriate solicitation tool for procuring one or more private sector end-market users of RDF; and
* Developing a clear understanding of the financial return on investment, costs of alternatives, and social and environmental impacts of this decision.

This solicitation review and final analysis is estimated to take 1 year to complete with the goal of issuing a request for services in 2017.

**Role of the Facility Committee**

The Facility Committee’s role in these improvements, as approved by the R&E Board in October 2015 is to:

* Review new technologies that are appropriate to the Facility,
* Review major Facility improvement plans, and
* Make Facility recommendations, including capital and technology improvements, to the R&E Board.

Beginning in May 2017 a significant amount of the Committee’s time will be spent on the technology improvement process. At the May meeting staff will present a more specific timeline and work plan to assist the Committee process.

**Attachment A**

**Ramsey/Washington County Resource Recovery Project**

**Ramsey/Washington Recycling & Energy Board**

**Technology Related Reports**

* April 2000, ***Research Feasibility of Dedicated Combustion***, Foth Report
* April 2000, ***Research Study of Alternative Waste Processing Technologies***, Foth Report
* November 2001, ***Comparisons of Potential Electricity Production from RDF and LFG***, Foth Report
* September 2004, ***Updated Research Study of Alternative Waste Processing Technologies***, Foth Report
* May 2008, ***Updated Research Study of Alternative Waste Processing Technologies***. Foth Report
* **May 2008, *Carbon Emission Analysis to Transport Recyclable Paper*, Foth Report**
* June 2009, ***Source Separate Organics Materials Anaerobic Digestion Feasibility Study,*** Foth Report
* June 2010, ***Organic Materials from Commercial Establishments – a Supply Assessment.*** Foth Report
* April 2011, ***Organics Collection Efficienc***ies, Memo from Foth
* May 2011, ***An Integrated Organic Waste Management System From the Perspective of Commercial Waste Generators***, JL Taitt and Associates
* January 2012, **Request for Expressions of Interest - Regarding Organic Waste Transfer Station Capacity and Related Management Services.** Resource Recovery Document
* October 2013, ***Preliminary Technical Status of the Newport and Two Xcel Combustion, Facilities,*** Foth
* October 2013, ***Alternative Technologies for Municipal Solid Waste***, Foth
* January 2014, ***Technology Comparative Analysis*** – Foth
* January 2014, ***Preliminary Resource Recovery Feasibility Report***, Foth
* Memorandum from Foth, dated April 18, 2014 – “***Water Needs and Use for Selected Technologies****.*”
* Memorandum from Foth dated April 18, 2014 – *“****Two additional technology options requested.”***
* Memorandum from Foth dated April 18, 2014 – “***Follow-up on Technology Financial Analysis****.”*
* Memorandum from Foth, dated April 18, 2014 – “***Sanigreen/Sanimax Summary Process Overview, Permitting Status; and Proposed Feedstocks.”***
* Memorandum from Foth, dated April 18, 2014 – *“****Follow-up comparison of the Current Newport RDF Plant and Vecoplan System.”***
* Memorandum from Foth dated April 18, 2014 – *“****Ethanol Demand versus Production.”***
* Memorandum from Foth, dated April 18, 2014 – “***Energy Analysis of Selected Proce*sses**”
* Memorandum from Foth, dated April 18, 2014 – “***Follow-up on Technology Siting and Permitting Analysis”***
* September 2014 – Report from Foth titled “***Waste Composition Study***”
* September 2014 – Memo from Foth titled “***Estimated Calculations of Additional SSR/SSO Tons”***
* September 2014 – Report from Foth titled ***“Analysis of Mixed Waste Processing (MWP) at the Newport Resource Recovery Facility”***
* September 2014 – Report from Foth titled “***Summary of Responses to Request for Expressions of Interest on Gasification Technologies to Process Mixed Municipal Solid Waste”***
* September 15, 2014 ***SaniGreen/Sanimax Summary of Status Discussion on August 27, 2014****,* memo from Foth.

**Attachment B: Scope for Resource Management**

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