

Biosolids Master Plan Public Meetings

January 14 and 15, 2014



Outline

- About biosolids
- Past and current practice
- Future plans
- Biosolids Master Plan
- Steps in developing Biosolids Master Plan
- Master Plan considerations
- Overview of six biosolids end product options
- Public engagement process
- Next steps

About Biosolids

- Nutrient-rich, organic, solid by-product from sewage treatment
- Contain significant quantities of nitrogen and phosphorous, as well as other trace nutrients
- Subject to strict Provincial regulations
- Potential for beneficial reuse
- Have distinctive odour, usually caused by compounds containing sulphur and ammonia, both of which are plant nutrients

About Biosolids

- Three City-owned and operated sewage treatment plants
 - produced about 13,500 dry tonnes of biosolids in 2012
 - biosolids expected to increase by about 50 percent by 2037
- Since 1930's, biosolids have been digested (in the absence of oxygen) producing 65% methane (natural gas) as a byproduct
- Methane used year round to heat digesters and onsite buildings, providing major savings in energy costs

Past Practice

- Incorporated biosolids into agricultural land at no cost to landowners, providing great benefit to the farming community
- Land application program was rigorously monitored and Provincially regulated



Current Practice

- Stopped land application program in 2010 due to more stringent provincial nutrient regulations under the Water Protection Act
- Started hauling to Brady Resource Management Facility (landfill) for disposal effective January 2011
- Landfill disposal not desirable in the long term:
 - lacks the opportunity to reuse the nutrients
 - increases potential for nuisance odours for neighbouring residents

Future Plans

- Investing about \$770 million* to upgrade north and south end sewage treatment plants, including nutrient removal (i.e., phosphorus, nitrogen)
- Composting about 20% of biosolids in a 2-year pilot program at a new \$7 million complex at the Brady Road Resource Management Facility
- Investing about \$200 million* in capital funding over the next 5 years for a new long term biosolids management program (includes engineering and construction costs)

Biosolids Master Plan

- Must be developed and submitted to the Province by October 2, 2014
- Must include:
 - sustainable reuse of biosolids and/or end product(s)
 - utilization of nutrients (nitrogen and phosphorous)

Steps in Developing Biosolids Master Plan

1. Issue a Request for Information to gauge private sector interest
2. Identify technologies to treat and reuse biosolids, including costs
3. Consult with industry professionals, regulatory authorities, other stakeholders, and the public
4. Select technologies to treat and reuse biosolids based on information gathered in Steps 2 and 3
5. Submit a Biosolids Master Plan to the province in October 2014

Master Plan Considerations

- Long term – 2037
- Satisfy current and expected regulations
- Proven technologies to minimize risk of system failure
- Multiple disposal options
- Beneficial reuse

Gauge Private Sector Interest

- Request for Information issued to private sector August 2013
 - understand if there are long-term, sustainable markets for biosolids
- First time exploring options for biosolids other than applying to agricultural land

Potential Selection Criteria

- Operational factors
- Time required to implement
- Regional suitability
- Stakeholders involved
- Regulation
- Good neighbour practice
- Ecological sustainability
- Cost

Potential End Product Options

- Land application
- Thermal oxidation/combustion and energy recovery
- Pelletization for soil conditioner
- Compost
- Land restoration/revitalization
- Landfill disposal

Land Application

- Haul biosolids to agricultural or forested land and use as fertilizer
- Manitoba: allows land application during growing season (April - November)



Land Application Elsewhere

- Most common practice in western Canada (about 80%)
 - Calgary (currently being phased out)
 - Edmonton
- Less common in eastern Canada (range from about 25% - 40% depending on Province)
 - Toronto, Ottawa
- USA (about 70%)
- Europe
 - most common in France and the UK (65 - 70%)
 - much less common in Germany and Northern Europe

Land Application Considerations

- Beneficial reuse
- Utilize nutrients
- Seasonal spreading restrictions
- Must ensure quality of biosolids
- Land suitability
- Requires storage
- Weather and soil dependent
- Odours
- Cost (\$\$)

Thermal Oxidation

- Firing the biosolids to produce heat and energy
- Reuse options for ash:
 - fertilizer (must have low metals)
 - asphalt mix
 - cement mix



Thermal Oxidation Elsewhere

- Eastern Canada
 - Quebec – 42%
 - Ontario – 20% (including Toronto)
- USA
 - 20% (including Minneapolis)
- Europe
 - France, Germany, Northern Europe
 - all include energy recovery

Thermal Oxidation Considerations

- Sustainable reuse with energy recovery
- Greatest volume reduction
- Ash is reusable
- Smallest footprint required
- Minimal storage and handling requirements
- Cost (\$\$)
- Requirements for air quality treatment and monitoring
- Low energy rates

Pelletization

- Dry the biosolids to form pellets
- Reuse options for pellets
 - biofuel
 - fertilizer



Pelletization Elsewhere

- Canada - at least 8 facilities (Toronto the largest)
- USA - at least 14 facilities
- Europe
 - more common in smaller cities
 - used mostly for fuel in thermal oxidation plants with energy recovery
 - includes Poland, Italy, Netherlands, Germany, Norway

Pelletization Considerations

- Lower volume of material
- Generates a marketable product
- Potential for using anaerobic digester gas for fuel
- Odours
- Decreasing demand for pellets
- Relatively small footprint
- Cost (\$\$)
- Dust is hazardous (e.g., health, explosive)

Compost

- Mix biosolids with woodchips and air to make compost
- Use compost as soil conditioner/amendment (alternative to peat moss)
 - nutrient source
 - retains water



Composting Elsewhere

- Western Canada:
 - Kelowna/Vernon, BC
 - Edmonton, AB
 - Banff, AB
 - Abbotsford, BC
 - Calgary, AB (procurement/design stage)
 - Winnipeg, MB (pilot)
- Moncton, New Brunswick
- Quebec (9% of biosolids composted)

Composting Considerations

- Sustainable reuse
- Utilize nutrients
- Strong demand as soil amendment
- Satisfies an existing need
- Potentially odorous
- Easy to store and handle
- Expensive (\$\$\$)
- Dependent on bulking agent
- Land/space required

Land Restoration/Revitalization

- Use biosolids to replace lost topsoil (e.g., landfill cover, large construction sites, surface strip mines, parks and road cuts, wetlands, wildlife habitat, conservation areas)
 - improves soil fertility and stability
 - decreases erosion
 - aids in revegetation



Land Restoration/Revitalization Elsewhere

- Demand of product: typically limited to less than 15% of global picture
 - Ottawa 12% (biosolids used for landfill top cover)
 - Quebec 2% (land restoration/revitalization)
 - USA 3% (land restoration/revitalization)

Land Restoration/Revitalization Considerations

- Beneficial reuse
- Nutrient utilization
- Satisfies existing need
- Requires pretreatment
- Cost, depending on pretreatment (\$ - \$\$\$)
- Labour and logistics
- Limited access/demand in Manitoba

Landfill Disposal

- Mix biosolids with garbage on-site and dispose in landfill
- Not considered sustainable reuse
- City or private contractor can dispose



Landfill Disposal Elsewhere

- Canada:
 - Ontario - 40% landfilled
 - Quebec - 31% landfilled
- USA:
 - 17% landfilled

Landfill Disposal Considerations

- Cost (\$)
- Reliable disposal
- Less disposal restrictions
- Does not utilize nutrients
- Does not utilize energy
- Decreases landfill capacity
- Odours
- Greenhouse Gas

Public Engagement Process

- Stakeholder Advisory Committee
 - three meetings to date
 - one more meeting scheduled
- Two public meetings
 - invitations mailed to stakeholders
 - news releases, ad in the Winnipeg Free Press

Stakeholder Advisory Committee

- Consumers Association of Canada (Manitoba)
- Green Action Centre
- International Institute of Sustainable Development
- Keystone Agricultural Producers
- Manitoba Conservation
- Manitoba Composting Association (MCAC);
Compo-Stages Manitoba Services Co-op (CSMSC)
- Manitoba Environmental Industries Association
- Manitoba Hydro
- Lake Friendly; Partnership of the Manitoba Capital Region
- Winnipeg Chamber of Commerce

Next Steps

- Consult stakeholders and the public - until January 24, 2014
- Develop a master plan: March - September 2014
- Submit master plan to Manitoba Conservation in October 2014
- Implement master plan once we receive provincial approval

We Value Your Comments

- Give us your comments by **Friday, January 24, 2014**:
 - comment on our website at wwdengage.winnipeg.ca/biosolids
 - email at wwdfeedback@winnipeg.ca
 - mail to 1199 Pacific Ave, Winnipeg MB, R3E 3S8, Attention: Biosolids Consultation
- Questions about the Biosolids Master Plan, contact:
 - Arnold Permut, Wastewater Systems Planning Engineer, by email at apermut@winnipeg.ca or by phone at 204-986-4817

Questions

wwdengage.winnipeg.ca

