Winnipeg
Water and Waste Department

BIOSOLIDS MASTER PLAN
PUBLIC PARTICIPATION
SUMMARY OF COMMENTS AND RESPONSES

February 2014

For more information on this report, please contact:

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Public Consultation & Research Officer
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Among the various free-form methods to comment, below is a summary of the feedback received along with responses (where applicable).

DATE RECEIVED	SOURCE	COMMENT	RESPONSE
Jan 10/14	Web page	GREAT IDEA! Proud that Winnipeg will get on-board with Eco-Friendly solutions! Patrick	No response required.
Jan 13/14	Web page	Anything that can reuse these materials in an Eco-beneficial way is good news. Go for it! Sara Jane Schmidt	No response required.
Jan 11/14	Email	Sounds like an excellent plan to me - go for it !! Regards Ute	No response required.
Jan 14/14	Email	To further cut down in sewage system would be to place curbside pick of organic waste for compost. As for sewage rich nutrient organic waste. To offer a safe bio environmentally friendly method of separation method option and en corporate as compost to be used in the public parks as a suggestion. As for curbside kitchen compost pick up. Do what they do in Europe and pick up option and deliver 3 large bags to each household or unit or apartment the amount needed to spread on thier property in the spring. Reuse recycle. Those are my suggestions.	No response required.
Jan 14/14	Web page	The major issues with biosolids is the heavy metal content Ahmed	See below.
Jan 15/14	Web page	'Biosolids' in this context are the solids left from sewage treatment. To the best of my knowledge, the average human excretes almost no heavy metals which are stored in the body, unless we're undergoing chelation therapy, or we'd be dying of heavy metal poisoning or at least suffering	Thanks for your comments Ahmed and Jaroslaw. Heavy metals in biosolids come from a variety of sources, including industrial and residential. Industrial discharges of metals to the City's sewer system is regulated through the

		from their toxicity. Winnipeggers don't eat fish from Minamato Bay. Jaroslaw Rudnycky'j	Sewer By-Law. The City prepares an annual report that is submitted to the Province and includes data on metals content in the biosolids: http://winnipeg.ca/waterandwaste/pdfs/sewage/complianceReporting/Biosolids/1089ERR_2012.pdf Although metals are present in biosolids, given the concentrations are relatively low, they are not the limiting factor on land spreading of biosolids
Jan 15/14	Web page	like we don't flush off other things in the closet?….. Ahmed	See above.
Jan 16/14	Web page	Let's recycle on farm land , it's a good fertilizer. Ron	No response required.
Jan 16/14	Web page	Hi. Would like to change my vote on thermal oxidation from somwhat oppose to strongly support. Also, each option will cost taxpayers something. So the cost of electricity should not be an issue. Generate electricity and what ever you get offsets the program. Thanks Dan Benoit	No response required.
Jan 16/14	Web page	Of the options offered, my first preference would be for composting, and second for land application. No proposal should be adopted that effectively destroys the valuable resources available in biosolids. I wonder, however, about the viability of using a pyrolysis process? Pyrolysis can be implemented at any scale. It is self-sustaining in terms of the energy required to maintain the process after start-up. It produces no nuisance odours. It has the virtue of producing a methane-like gas byproduct which can be used to fire the process itself, plus a deisel-like distillate that can be used to fuel vehicles, run co-gen units,	Thank you both for your comments and providing us a reference on the pyrolysis process. We have reviewed the reference provided as well as looked at what is being done world-wide. While it is generally recognized that pyrolysis is an established technology in some industrial applications, pyrolysis of sludges and biosolids is currently considered an innovative technology and has limited application for municipal biosolids. An important criterion in developing the Biosolids Master Plan is that processes considered must have a demonstrated track record in municipal applications of similar size. While

		etc. Pyrolysis units could be installed right on the premises of water treatment plants, thus eliminating the need to transport solids. Most attractive, it also produces biochar which is nearly pure carbon, an excellent soil amendment, and a substance which, once incorporated into the soil, actually sequesters carbon from the atmosphere. The carbon sequestration properties of biochar might offer the possibility of selling these carbon credits on the open market and help to partially finance the operation. Today, there are many bogus "carbon offset" schemes that avoid emissions but don't actually sequester carbon. Pyrolysis actually sequesters it. My final thought is just the suggestion that your consultation process try to consider the costs and benefits of various options using the assumption that Manitoba Hydro didn't exist. Our artificially depressed energy prices create a sort of black hole that warps light coming from every direction in this province. We do enjoy a hydro advantage in Manitoba. But I think the opportunity cost is unacceptable if we assume that we will always have this advantage under regimes of a changing climate. We may find instead that energy prices across the board become more volatile and supply interruptions more frequent. In such circumstances, it would be prudent to distribute risk across several initiatives or interventions each of which is viable on its own merits in the long run, even though the hydro advantage we now enjoy makes them appear relatively uncompetitive in the short run. Mark Burch	the pyrolysis process shows promise for future energy recovery, it cannot be considered a viable option at this point in time.
Jan 23/14	Web page	Here's a reference for Mark's pyrolysis option. http://news.cnet.com/8301-11386_3-57608281-76/carbon-	See above.

		negative-energy-a-reality-at-last-and-cheap-too/ Peter Miller	
Jan 23/14	Web page	I support all of the listed potential beneficial reuse options for biosolids. Kevin Miller	No response required.
Jan 23/14	Web page	It can be helpful to look at all organic waste stream components together and look for linked solutions rather than segment by segment. For example, by about this time, the City was supposed to initiate a green bin kitchen waste pickup and recycling project. Note that biosolids are products of anaerobic digesters that produce biogas. New York City has recently initiated a project to add a kitchen waste slurry to sludge digesters to produce more biogas. Whatever biogas is not needed to heat the facility can be refined sufficiently to inject into Centra's system. See http://cleantechnica.com/2013/12/28/food-scrap-recycling-joins-wastewater-treatment-in-new-nyc-project/. Note that Fortis BC (previous employer of Hydro's CEO Scott Thomson) markets "renewable natural gas" from such injections and permits customers to pay a $5/month premium to "green" their heating by this means. This serves as a partial financing source for such an initiative. Peter Miller	No response required.
Jan 23/14	Web page	The composting program sounds promising. I'd list that as my preferred option. Landfill is not a preferred option due to elimination of biologically available nutrients. Other considerations:	No response required.

		Spread biosolids in areas with limited public access (i.e. power corridors) for natural attenuation of metals impacts. Nobody is using the land anyways. Approach farmers to create land-berms along the edges of their fields for microclimate wind protection of crops during dry summer months. Glad to see that the City is allowing public consultation. Don't increase our taxes with a half-brained "solution". Alex	
Jan 26/14	Web page	Having lived many years in Germany, I am familiar with green bin kitchen waste being turned into compost for the public to buy back. (Toronto and the GTA is also following this system now.) This is one way of reclaiming some of the costs. I strongly feel it would be better for the city of Winnipeg to not go the cheaper route and really follow a longer-term initiative. Re-cycling IS the way for the future, and yes, the public will have to pay towards it. Which also means that they will be more selective about what gets recycled, and NOT just throw everything in the garbage as they are used to doing. Educating the public is sorely needed as far as I'm concerned. Unless everyone works together to make this work for the city, it will end up costing the taxpayer even more than is reasonable. It is up to the Government to demand of the manufacturers that less packaging be used in production, thus reducing the amount of paper and plastic that lands in the recycle plants. This probably wouldn't suit them, due to oil being a big source of income and what is plastic made from?? It seems ridiculous, with the destruction being caused by the oil sands that we	No response required.

		are even contemplating the environment! Perhaps that's why so many just don't care, or is it ignorance? Which goes back to education. Just don't add more of an odour problem to the air in Winnipeg and surrounding areas! Cheron Long-Landes	
Jan 26/14	Web page	The owner of Eco Sciences, LL has developed a newly patent pending solar technology for processing wastewater biosolids ONLY using solar energy, which coverts it into a safe pasteurized fertilizer. This process is called SolarOrganite®. We are currently looking for municipalities and utilities that would be interested in putting in this newly developed technology. Since this is a new process, we are willing to put in a SolarOrganite® Biosolids Management Facilities at WHOLESALE COST ONLY. We are also open to entering into a Public – Private – Partnership. The total cost of the SolarOrganite® Biosolids Management Facilities can be paid in full using only your current sludge disposal budget. No more capital expenses. No need to increase taxes. Maybe even lower taxes ! The SolarOrganite® process is clean, green and seen as the most cost-effective process. Gary Hammond, President Eco Sciences, LLC Office: 352-358-1222 Email: EcoSciences@gmail.com Web Sites: http://www.EcoSciencesLLC.com	Hello Gary, We recommend that Eco Sciences LLC submit technical information to us on their proposed process for treating biosolids. This submission will be reviewed and considered along with information from other potential treatment options during the preparation of the Biosolids Master Plan. As we are wrapping up the public engagement process, we would need your submission within a couple of weeks. We will review the treatment options based on the evaluation criteria that have been supported through the public engagement process.

		http://www.SolarOrganite.com	
Jan 27/14	Web page	Hi Gary, It's unclear whether or not your company has had a dialogue with Winnipeg Water & Waste regarding your process. Are you at liberty to provide clarification? Thanks, Jerry	See above.
Jan 28/14	Web page	Jerry, No we haven't had a dialogue with Winnipeg Water & Waste regarding our process. If they are interested, we are open to discussions with them. Gary Hammond	See above.

Jan 24/14 Email submitted comment, with response

City of Winnipeg
Response to BMP Public Meetings

Submission Deadline: Friday January 24, 2014

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In response to the Biosolids Master Plan (BMP) public meetings held January 14-15 2014, we would like to comment on the information that was presented.

For over thirty plus years Terratec has provided municipalities in Ontario reliable and cost effective biosolids management services with both Class B and Class A biosolids technologies. While the City of Winnipeg's presentation looked at some of the pros and cons of each method selected, we feel our considerable experience in the biosolids management industry would help strengthen the City's understanding of some of the opportunities, and challenges, faced by each of the potential end product options and technologies reviewed in the BMP public meetings. There are pros and cons to all of the potential end use options, but it is clear that some are more sustainably suitable in terms of beneficial reuse and cost effectiveness.

Land Application
Terratec recognizes land application of biosolids as the most cost effective and sustainable of all of the potential end product options. When managed appropriately this method is the best alternative to managing biosolids. In fact many of the larger municipalities in Ontario and other provinces utilize land application to beneficially reuse their sewage biosolids. Comparable Ontario municipalities that utilize land application are the cities of Toronto and Hamilton, as well as regional municipalities like Halton, Waterloo, Durham and Niagara. All of which we either currently provide service to or have done so in the past.
Comparatively, land application has the lowest capital costs associated with all other methods. Biosolids have valuable nutrients that are vital to farmers and their crops. Some nutrients and organic matter present are nitrogen and phosphorus, as well as micronutrients such as zinc, magnesium and copper.

The benefits of land application of biosolids include improving soil fertility which offsets the need for commercial fertilizers. It also enhances soil structure and moisture retention by the addition of organic matter, while adding permeability which reduces the potential for wind and water erosion.

One concern may be the consideration of storage of dewatered material, which is essential to run a beneficial and sustainable land application program. There are many storage options available with a low capital investment that will ensure the City an appropriate storage facility that will capture and scrub odours mitigating neighbour concerns. Additional concerns are managed through extensive public relations by education and communication which have proven quite successful for Terratec in the past. And because land application typically occurs in largely rural areas, if there are any odours produced from the spreading process, concerns and complaints are quite limited.

Additionally Terratec is capable of land applying over 2,000 tonnes of material in a day. We are certain that an updated land application program would easily be managed to handle Winnipeg's biosolids management needs.

Land Restoration/Revitalization
This particular potential end product of biosolids could be beneficial to the City as well as sites that need to be remediated. Some of the benefits of this method are remediating land or areas that were once considered too contaminated for any human or animal use. This method could aid in providing an inexpensive alternative to the reclaiming of strip mines through soil improvements which aid in the revegetation process.

Although the demand for this product may be quite limited in Manitoba there are a variety of different outlets that can be utilized to provide additional disposal, including mineland reclamation. In fact, if incorporated into a diverse land application contract it may allow for a substantial beneficial reuse biosolids program.

This could also be a segment of a diverse land application contract. As it may not be a requirement in Winnipeg, it may be a possibility in an economical distance especially as an offset in winter months

Thermal Drying and Pelletization
Terratec is quite familiar with thermal drying and pelletization. We successfully operate Prism-Berlie, a facility in Windsor, Ontario with the end product being beneficially reused as a fertilizer. Thermal drying operations can be very difficult to operate but Terratec's Prism Berlie Windsor Facility has an enviable operations record and consistently provides more than 35,000 tonnes of product each year.

Pelletization is a complex system in comparison to other biosolids management alternatives. Thus implementing this solution will have higher capital costs. However with the right experience and expertise thermal drying and pelletization technology can be an effective beneficial use application with all the benefits of a Class A technology in the form of a CFIA approved soil amendment or fertilizer.

Compost
Similar to land application of biosolids, there can be a strong demand for composted biosolids as a soil amendment.

However, composting is an expensive and labour intensive method of managing biosolids for a variety of reasons. This includes many steps of managing various products prior to marketability of the final material such as sourcing, purchasing and storage of a bulking agent and as well has having continuous access to additional bulking material. Supplementary associated costs include a site suitable for the storage and operation of the program, the cost and addition of the bulking agent as well as implementing process controls that include consistent monitoring and measuring of the compost process. Furthermore, mixing of material typically is needed to be done with heavy equipment in addition to the post mixing storage piles that must be maintained during the curing process.

An ever present concern with composting would be the impact the process has on workers. Workers may be exposed to fungis; endotoxins, which can elicit strong immune reactions; and other allergens. While these challenges can be managed by wearing protective devices such as masks or air filters, airborne compost or organic dust can be a concern if not properly managed. Compost off gases may negatively impact air quality which would be a serious concern to local area residents.
Additional concerns associated with composting of biosolids are odour problems, which will be a problem if the site is located in close proximately to urban areas. Furthermore, product quality may lack consistency.

Thermal Oxidation/Combustion and Energy Recovery
Also known as incineration, thermal oxidization has a very high capital cost. Incineration customers often find it difficult to recover these costs through energy produced due to current low energy rates. In order to fund such a large project, costs may have to be recovered by rate payers despite other cost efficient disposal methods.

Another cost prohibitive concern with incineration is that an alternative disposal method is always necessary, as incinerators experience significant down time for routine maintenance. This would result in additional capital resources for implementing a contingency plan that would likely require storage and alternative disposal costs. For example, the City of London, ON annually has to shut down the incineration program for maintenance, during which time an alternative method of disposal is required. This further adds to the costs of an incineration program. Meeting increasingly stringent air quality standards will require ongoing capital improvements.

Depending on the quality of ash that the incineration process produces, landfilling the end product may still be required. While the City has the benefit of a large amount of landfill space, it would not fit the criteria for being sustainable. Furthermore, valuable resources are destroyed during the incineration process. Currently global resources for phosphorus are declining, however the global nutrient demand are increasing from 40 million tonnes to 61 million tonnes of nutrients per year. It is expected that there will be an 11% demand increase for phosphorus over the course of the next 5 years. The global demand of over 100 million tonnes of nitrogen, rising at a 6% rate and 14% increase rate for potassium.[i] By destroying these valuable nutrients used in fertilizers, incineration is implicated as being not only unsustainable but also unnecessarily wasteful.

Landfill Disposal
Not sustainable, should be used only has a contingency.

Conclusion
Ultimately we feel that land application of biosolids is the best and most sustainable alternative for a biosolids management program. As evidenced in a review of the alternatives above land application is

the superior solution. Additionally from our extensive experience in the industry, land application has consistently proven that it is the best method of management in terms of cost, beneficial reuse, simplicity of program application and reliability.

[i] Sidhwa, Phil. *Turning Waste Into a Valuable and Sustainable Resource*, Water Environment Association of Ontario, November 13, 2013.

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From: Permut, Arnold
Sent: Thursday, February 06, 2014 1:01 PM
To: Adam.Moote@amwater.com

This is to acknowledge receipt of your thoughtful comments on the options presented during our Public Engagement process for our Biosolids Master Plan.

We appreciate your firm's interest in the important project for the City of Winnipeg.

In response to your comments, we are aware that your firm responded to our Request for Information on disposal of biosolids. The evaluation process for this RFI has not quite been completed, however, please be assured that we are carefully considering both your response to the RFI as well as your comments on our Public Engagement Process as we move towards completion of our Biosolids Master Plan.

Again, thank you for your significant interest in our program.

Regards,
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Jan 26/14 Email submitted comment, with response

From: Peter Miller [mailto:p.miller@mymts.net]
Sent: Sunday, January 26, 2014 10:53 PM

Hello Arnold, Darryl and all,

I commented online at several places on the Biosolids Master Plan consultation site but wanted to summarize my points in one place, this email. A major concern of mine at the workshop was that biosolids seemed to be considered separately from other organic waste streams rather than developing an Organics Master Plan. I learned only on Thursday at the 4R consultation that the department is engaging a consultant to prepare options for all organics, including biosolids. I hope you can persuade provincial regulators that it is worthwhile to wait until the more comprehensive study is completed before finalizing a management plan for biosolids. In any case, here are some thoughts to feed into the process.

1. Winnipeg should aim at 100% diversion of organics from the landfill to avoid harmful GHGs and wasted nutrient and energy resources.

2. Ecologically sound, non-harmful beneficial uses are the right criteria to apply. Costs should be a secondary consideration and should include external costs and benefits as well, such as carbon costs and credits from GHG emissions or sequestration.

3. Choices between options require quantification of benefits, costs and harms. In particular, this means net GHG emissions, net energy yield, release of heavy metals and other substances of concern, and quantities of nutrients recovered and made available. Direct city costs and benefits are also relevant but subordinate to the preceding.

4. Winnipeg needs a systematic review of all organic waste streams, including an examination of potential synergies. One example is adding liquefied food waste (household kitchen waste + commercial waste from restaurants, grocers and food processers) to the sewage anaerobic digesters, as New York City is doing, and harvesting and refining the biogas for heat or injection into the natural gas pipeline system or electrical generation. (See http://cleantechnica.com/2013/12/28/food-scrap-recycling-joins-wastewater-treatment-in-new-nyc-project/.) Another example is co-composting dry yard waste (branches, trunks, leaves) as a carbon source with biosolids.

5. Winnipeg should look at innovative financing possibilities for the different options before drawing conclusions about what is or is not economic. Note, for example, that Fortis BC (previous employer of Hydro's CEO Scott Thomson) markets "renewable natural gas" from such injections and permits customers to pay a $5/month premium to "green" their heating by this means. This serves as a partial financing source for such an initiative. Work with the Province and Manitoba Hydro. (http://www.fortisbc.com/NaturalGas/Homes/Offers/RenewableNaturalGas/Pages/default.aspx)

6. Finally don't put all your eggs in one basket at this point when information gathering is incomplete. Indeed going forward a suite of solutions is likely to be preferable to one to allow for resilience if

market or other conditions change. For example, in addition to the biosolids composting pilot, try land application that fits the new environmental standards with soil testing and monitoring.

From: Permut, Arnold
Sent: Thursday, February 06, 2014 1:41 PM
To: Peter Miller

Hi Mr. Miller.

It was good to hear from you via your email that lays out your recommendations in a very comprehensive and thoughtful manner. We appreciate your ongoing interest in not only our Biosolids Master Plan but our Solid Waste Master Plan as well.

While I may not be able fully address all of your comments at this juncture, I will do so as best as I can.

Respecting your recommendation that we persuade the regulator to postpone the due date for submission of our Biosolids Master Plan, unfortunately based on discussions we have had with the regulator to date, we believe a change in the due date will not be possible. However, that in no way precludes us from assuming an ongoing approach to reviewing emerging technologies and concepts, as well as possible synergies with the Solid Waste program. I would view this as prudent engineering practice.

In response to your comments about giving consideration when assessing options to all costs over and above monetary costs, including environmental costs and benefits, please be assured that is an inherent part of our assessment process for determining preferred options.

We are also in frequent communication with our Solid Waste Division and are aware of their programs as they are developed. Once we get our biosolids composting pilot program functioning reliably as designed, we will continue to explore synergies with the Solid Waste programs. Should advantageous opportunities arise for synergies, there is nothing precluding us from going back to the regulator and making a rational case for modifying the licence to accommodate such options.

With respect to your comment about exploring innovative financing possibilities for energy produced from our proposed biosolids program, you likely will be interested to know that we have had as a member of our Stakeholder Advisory Committee a person who works at Manitoba Hydro whose main responsibilities rest with green energy opportunities. Accordingly, please be assured that we are mindful of pursuing such options as they present themselves.

Finally, your comment about “not putting all our eggs in one basket” when selecting biosolids disposal options, I can tell you that we concur with this completely. Having a “suite of options” available to us has been one of our basic guiding principles as we

move forward with this plan. We cannot run the risk having only one alternative and then see it fail since we are providing the public with an essential service that must be reliable 100 percent of the time.

Once again, thank you for your great interest not only in our Biosolids Master Plan but also the Solid Waste Master Plan. We appreciate you taking the time to consolidate your comments in one comprehensive email for our consideration.

Regards,
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From: Peter Miller [mailto:p.miller@mymts.net]
Sent: Thursday, February 06, 2014 2:08 PM
To: Permut, Arnold

Thanks for your thoughtful reply, Arnold.

You mention that your committee has a Manitoba Hydro representative who specializes in green energy opportunities. There is obviously a technological side of that but financing mechanisms are another matter and I haven't seen any discussion yet by MH of green premium financing, which is common in the US and, as I mentioned, at FortisBC. I hope that he can investigate whether MH would be open to that option and report back to the committee.

Thanks again,

Peter