

June 5, 2013

Issues, Comments, Questions and Metro Vancouver Responses

Structured Decision-Making Workshop *Summary*

Friday, May 31, 2013, 9:00 a.m. – 5:00 p.m.
Pier Two Room, Pinnacle Hotel
138 Victory Ship Way, North Vancouver, BC

metrovancouver

SERVICES AND SOLUTIONS FOR A LIVABLE REGION



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1. Meeting Opening and Introductions

John Forsdick, Facilitator, Context Research called the meeting to order and thanked the Lions Gate Public Advisory Committee (LGPAC) and Community Resource Forum (CRF) members for attending. The workshop is intended to guide participants through the structured-decision making process.

Fred Nenninger, Project Manager Wastewater Secondary Treatment Upgrades, Metro Vancouver (MV), discussed the project objectives and noted that through the integrated design process these broad requirements have been developed into three Build Scenarios. The business casing of the three Build Scenarios will be brought forward to the MV Utilities Committee on June 25, 2013.

2. Influence of Public Input to Date

Marie Griggs, Public Involvement Manager, MV, advised that MV had changed the consultation process in response to LGPAC and CRF interest for more in-depth involvement and direct input into a structured decision-making process. Ms. Griggs brief presentation highlighted:

- the impact of LGPAC and CRF input to date
- evaluation framework for the objectives hierarchy that has been influenced by input received
- how community input into the nine Design Concepts helped develop the three Build Scenarios

Ms. Griggs advised that the end of the project definition stage is approaching and will be finalized by the end of the year. The LGPAC Chair and Vice Chair will be involved in developing the details of the public consultation process for the fall.

3. Overview of Structured Decision-Making (SDM) Process Used by Metro Vancouver for Evaluating Alternatives

Graham Long, Compass Research, gave a presentation on Structured Decision-Making (SDM) highlighting:

- definition of SDM by Ralph Keeney: “... a formalization of common sense for decision problems which are too complex for common sense”
- methods and elements involved in SDM
- difference in the decision-making process using SDM

4. Review of Objective Hierarchy and Measurement Scales

Mr. Long noted the Lions Gate Secondary Wastewater Treatment Plant (LGSWWTP) must have the ability to treat wastewater from the North Shore to secondary standard as defined by the Wastewater Systems Effluent Regulations under the federal Fisheries Act, and as committed to in MV’s Integrated Liquid Waste and Resource Management Plan (ILWRMP), approved by the Minister in 2011. The LGSWWTP must be in service by December 31, 2020 and meet the project goals of robust secondary treatment, sustainability, Integrated Resource Recovery (IRR) and community integration. Beyond these constraints, the objectives of the project are open-ended and therefore, it is important to capture additional project criteria.

5. Exercise 1: Individual Swing Weighting

Mr. Long explained that, during Exercise 1, the participants would rank the importance of project objectives. He then led participants through a weighting and ranking exercise of the objectives outlined in the “Lions Gate Secondary Wastewater Treatment Plant Objectives Hierarchy and Measurement Scales” handout.

Break

The Workshop recessed at 11:08 a.m. and resumed at 11:25 a.m.

6. Summary Presentation of the Nine Concepts

Ms. Ford referred to the handouts titled “Lions Gate Secondary Wastewater Treatment Plan Design Concepts & Build Scenarios” and “Summary Table for 9 Design Concepts”. She reviewed what is included in each design concept:

- liquid treatment level
- effluent use (other than outfall)
- solids treatment
- co-management with North Shore food waste
- energy recovery
- potential to use effluent heat for adjacent district energy projects
- plant footprint
- potential for education
- other features

7. Exercise 2: Individual Direct Weighting

Mr. Long noted that there are two approaches to decision-making: “System 1 vs. System 2”. System 1 is “snap” decision-making or “gut level response”. System 2 is more systematic and requires the criteria and objective hierarchies to be identified properly.

Mr. Long advised that Exercise 2 uses “snap” decision-making. The Weighting Form includes a section on “Direct Ranking” where participants ranked and weighted each of the design concepts.

Break

The Workshop recessed at 12:30 p.m. and resumed at 1:30 p.m.

8. Discussion of Weighting Results and Comparison with Previous Findings

Mr. Long provided participants with charts of their individual results for Exercises 1 and 2, and compared and contrasted the relative performance of several design concepts. Participants discussed:

- Concept 1 – Inter-Tidal Wetland and Concept 7 – Urban Garden:
 - Both do relatively well in terms of Objectives 1 and 2 and they are also the least expensive in terms of ratepayer cost and rate risk.

- Relative to the other concepts, if you put more weight on Objectives 1, 2 and/or 5, the more you should expect to see Concepts 1 and 7 rise-up since their overall score is a product of how they perform and the relative weight that you put on those issues.
- Concept 1 performs better in the community integration objectives and Concept 7 performs better for a variety of other measures such as public risks.
- Raises the question: are they too much alike; should they compete or be merged?

- Concept 3 – Network and Concept 4 – Ant Colony:
 - Both perform well in the sustainability objective.
 - There are bigger financial and operations risks and costs associated with Concepts 3 and 4 but are these risks and costs worth the sustainability pay-off?
 - If you put a lot of weight on the sustainability policy and IRR objectives and do not put as much weight on costs, then Concepts 3 and 4 will start to rise to the top

- Concept 2 – Living Breathing Organisms and Concept 6 – Perpetual Motion Machine:
 - They are similar in cost.
 - Both Concepts 2 and 6 are inexpensive and simple.
 - They cost more than Concepts 1 and 7.
 - The performance of both is mediocre in many of the objectives.
 - One would excel only if a specific sub-objective was heavily weighted.

- Concept 5 – Flea Market:
 - This concept was aimed at community integration and ways to get the public onto the site.
 - One way to reduce the footprint of the plant is to use thermal reduction. This would free space for public use but it would not enable the reuse of a lot of the materials for energy.
 - It does not do well in the sustainability and IRR objectives.
 - It has strong community aspects but must consider whether it is “sustainable” enough.

- Concept 8 – Urban Ecology:
 - It is similar to Concepts 2 and 6 except its performance is better.
 - If you distributed your weights fairly evenly across the five main objectives, Concept 8 rises to the top because it is a strong all-around performer.

- Concept 9A and 9B – Dragons Den:
 - These two variants were aimed at maximizing local economic development.
 - They scored highly in maximizing local economic development, but they performed poorly with community integration because of the way they were conceived and assumptions made about IRR.

Mr. Long reviewed the results of Exercise 1: Swing Weighting. The results demonstrate the range of weights given by the group. Comments included:

- The focus should be on building a sewage treatment plant.

- Meeting MV's overall sustainability policies received the lowest ranking because the project seems to be more about the resource recovery, community integration and the wastewater treatment plant.
- Climate change resonated with participants as an opportunity to build something that is at the forefront of sustainability.
- Climate change seems less important when compared to the other considerations.

Participants' comments on the rationale for the individual results of the sub-objectives weightings included:

- The overall environmental aspect is the treatment of human waste and the objective of the exercise is to assimilate that waste in the most efficient way.
- Contaminants in the air are the only parameter that seemed relevant to the community. Economic objectives also seemed relatively important. The future-proofing aspect resonated. It is an opportunity to build some flexibility for future technologies and future values in terms of regulatory changes and higher standards. It is the right place to put something like a wastewater treatment plant. The site is in an industrial area and a commercial area provides a buffer between the industrial area and the residential area. It is not unreasonable to have truck traffic in an industrial/commercial area.
- Sound funnels from the industrial area - so this site is essentially in a residential neighbourhood. Given the fact that this is a very industrial area that already has a lot of noise, the traffic already has a significant impact and additional traffic can have an exponential effect on people in the community. Reduce traffic where possible. It is difficult to design for future standards that cannot be anticipated. The project should not put money and effort into what might happen in the future.
- MV has a finite amount of money to spend. Perhaps it is better to spend tertiary treatment funds on a bigger project somewhere else where the same dollars could provide greater environmental benefits.
- It does not make sense to use trucks; if it's possible, use a more fuel-efficient barge, on-site incineration, or other process. Ensure there is enough real estate left to address future regulatory changes.
- The most consistently weighted piece is odour: there is wide recognition amongst a broad group of people that this is an important consideration.

Mr. Long reviewed the direct weight assigned by participants to the alternatives, which indicates the "gut response" to the alternatives. Outlying responses, relative to the group, included:

- The treatment plant serves an environmental purpose to treat the sewage.
- The inter-tidal wetlands concept seems most appropriate. We are losing coastal habitat so if there is an opportunity to recreate habitats and have a functioning treatment plant it's a win-win. From a technical perspective, the Dragons Den option seems feasible and it still has the capacity to reuse water.

Mr. Long reviewed the consistency of the results using the two decision-making techniques. Participants provided insight into inconsistencies between weighting results from the two techniques, noting:

- Concept 2 – Living Breathing Organism seemed to be the centre of the community and being located in an industrial area, this was not attractive.
- Concept 4 – Ant Colony is a decentralized system. There are benefits and disadvantages to operating a decentralized system. The criteria did not seem to draw attention to some of the wider benefits of those approaches.
- A decentralized system is more resilient in some perspectives such as being flexible to accept new technologies but it is hard to measure. If other values are considered, a little extra cost might be acceptable.
- The principle that the site is to treat and dispose of sewage is its primary goal.

Participants offered the following comments in response to the question on the value of having a strong narrative around the design concepts:

- Concept 2 – Living Breathing Organism would be attractive if you could convince the community to locate it away from an industrial area. The narrative option suggests that it would be a focal point for the community.
- For these kinds of projects, the more the outcomes are discussed, the more the community understands why it is happening and buys in. Creating a strong environmental and community narrative is incredibly important. Part of this is being able to talk to people about how this is going to impact them.

Mr. Long reviewed a chart showing the level of consistency of the results from the direct weighting and the swing weighting techniques across people, and across the group. The results of both techniques indicate a preference for Concept 1 – Inter-tidal Wetlands, Concept 7 – Urban Garden and Concept 8 – Urban Ecology. During a discussion of the consistency of the group results, participants offered the following insights:

- Concept 1 - Inter-tidal Wetlands made sense from a technological perspective, as opposed to the networking concepts.
- In considering Concept 9 – Dragons Den, the application of land in terms of building structures was not top of mind. It's about what was purely reasonable, feasible and acceptable from a technical basis that would achieve the water quality objectives.
- The most effective components of the leading candidate Concepts 1, 7 and 8 were reconfigured to create Build Scenario C – Natural.
- Concepts 3 and 4 were strongly favoured by some people and the most effective components were reconfigured to create Build Scenario A – Resource.
- There were individual thematic and engineering ideas within the remaining alternative that people thought were important to explore and these were reconfigured to create Build Scenario B- Community.

Break

The Workshop recessed at 2:50 p.m. and resumed at 3:02 p.m.

9. Summary Presentation of the Three Build Scenarios

Ms. Ford referred to the handouts titled “Lions Gate Secondary Wastewater Treatment Plan Design Concepts & Build Scenarios” and “Summary Table for 3 Build Scenarios” and reviewed the components of each of the three Build Scenarios:

- Liquid treatment level
- Effluent destination (10% to supply non-potable water requirements for adjacent industries with the remaining going to the existing outfall at the Lions Gate Bridge)
- Solids treatment
- Co-management with North Shore food waste
- Use of solids
- Energy recovery
- Use of effluent heat for adjacent district energy systems
- Other features.

Ms. Ford noted that there are trade-offs in how each of the Build Scenarios perform in terms of solids and liquid performance. An assessment was conducted of the relative ability of each Build Scenario to perform with respect to following key objectives:

- 1F – Ability to adapt to future legal or regulatory changes such as nutrient and micro constituent removal
- 3A – Ecological service provision (increased habitat potential)
- 3B – Biological Oxygen Demand (BOD) loading to Burrard Inlet (correlates to level of treatment – must meet secondary)
- 5A – Expected ratepayer cost (net present value of long-term revenue and expenses).

Design Scenario C (Modified) is intended to address the cost issue by discharging to pocket estuaries most of the time and to the outfall during wet weather events. This modification results in a marginal cost reduction and slight increase in the biochemical oxygen demand (BOD) loading to Burrard Inlet.

10. Discussion: Key Trade-offs Requiring Input

Mr. Long facilitated a discussion on the cost and benefit trade-offs between Build Scenario B and C (Modified) on the liquids treatment. In response to the question: “what additional information is required to determine if it is reasonable to spend additional money for environmental benefits?” Participants offered the following comments:

- Need to know the absolute cost.
- What does BOD mean and what are the impacts on the sea bed and to sea life?
- If money is spent on reducing BOD, what is the percentage reduction of the total BOD load in the receiving environment compared to the incremental reductions?
- Are there other technologies available to achieve the same effluent quality at a lower cost?

Ms. Ford described four options for solids treatment and reviewed the assessment of the relative ability of each option to perform with respect to the following sub-objectives:

- 1D – Number of truck trips per week at plant site
- 1C – Risk of odour nuisances (for solids handling at both sites)
- 3C – Greenhouse gas emissions
- 3D – Criteria air contaminants (plant operations less emissions avoided elsewhere)
- 4A – Net energy use (includes energy value of dried pellets)
- 5A – Expected ratepayer cost

Ms. Ford introduced a modified Build Scenario B, which included independent food waste management on a second site.

There was discussion on the significance of the trade-offs between processing solids on-site and off-site (Scenarios A vs. B) during which the following comments were made:

- Apply more rigour to every variable
- Provide more context around the traffic issue
- Provide more detail on truck traffic e.g. noise (compared to vehicular traffic, routes, dust, travel times (morning, afternoon, evening) etc.
- Consider rail traffic;
- The biggest impact from a health perspective is an increase in noise at night when people are trying to sleep
- With any kind of emissions from the site, it's necessary to look at acceptable health levels as the context
- Provide baseline for GHG emissions to give Scenario A context
- GHG levels indicated are predicated on the fact that the pellets would be sold to cement kilns. Need sensitivity analysis on what these end results would look like if different input assumptions were used to get a feel for the variability that is reasonable to expect.
- Need more information on location of the second site is in order to determine if it is a viable alternative
- To what extent are the processes self-contained on the North Shore? Should it be a policy decision to treat the waste locally?

There was a discussion on the significance of the trade-offs between Build Scenario C and Build Scenario B (Modified) during which participants' comments included:

- Need context re health hazards of emissions
- Need context on whether any hazardous materials would be transported on the North Shore
- Need to consider the risk to the public of chemicals being brought onto the site.

11. Wrap-Up and Close

Ms. Griggs and Ms. Ford reviewed the next steps in the process:

- Information received at this workshop will flow into the technical process for the business cases
- The business cases are being developed and will be presented to the MV Utilities Committee on June 25, 2013

- Contextual information requested will be considered to determine if further technical work is required
- Developing workplan for LGPAC and CRF
 - Meeting will be scheduled during week of July 8, 2013
 - Meeting with North Shore Councils scheduled for July 4, 2013
- The entire workplan and the responses to the contextual questions raised today will be provided at the meeting during the week of July 8, 2013.

Mr. Forsdick facilitated a roundtable discussion with participants on their comfort with the process. Comments included:

- Don't characterize the environment and economics as a trade-off
- When talking about adding contaminants to an environment, consider thresholds
- Further analysis is needed on the cost of becoming more environmentally sound
- Would have appreciated having the nine Design Concepts before getting to the three Build Scenarios
- Important that everyone have the same story
- The risk of trying to boil everything down to one number over-simplifies issues
- There is a difference between the discussion here and political discussions
- Need to have a succinct and understandable narrative
- Moving forward, more detail about the Build Scenarios would be appreciated
- Concerned with the technology selection and want to ensure prudence with money and value
- It may be useful to split it into two evening to allow time to discuss other issues
- We are moving into the political process and so have to be sure that values, other than just financial, and are brought to bear on discussions
- MV has a responsibility to invest funds into something that the community can be proud of
- Looking at the contaminant loading cannot be done in isolation
- Need to try to raise everyone's knowledge to enable a conversation about values
- If a strong story is developed, people's opinions and concerns can be responded to

The Workshop concluded at approximately 5:03 p.m.

12. Issues, Comments, Questions

The following table summarizes MV's responses to questions and concerns raised by attendees, throughout the meeting organized by topic:

Issue, Comment, Question	MV Response
Review of Objective Hierarchy and Measurement Scales	
What is the meaning of "risk" and what are the risks?	The risks are described in the "Objectives Hierarchy and Measurement Scales" document.
If there are questions about what risk means, how should it be ranked?	A panel of engineers on the design team came up with an overall description. We tried to give you

Issue, Comment, Question	MV Response
What risk to public is being examined with respect to operations and maintenance?	<p>the outer boundaries of what we see as risks. This is a general sense of how important certain things are in relation to each other. They are within the normal design constraints of the western world so we are not designing something that is inherently very unsafe.</p> <p>Please refer to the “Objectives Hierarchy and Measurement Scales” document that provides an explanation of what was considered as part of the objective.</p>
There is no list of possible events and consequences – it is all bundled under the title of risk.	This is an example of trying to find the balance between giving an overview of an issue and getting into the detail.
Simplify the process to the community’s key concerns. Establish a community hierarchy relative to an array of technologies. Then the next question is the weighting between the operational and community’s objectives and concerns.	We had a panel of qualified people going through the technical analysis of the different objectives to give a range that people can assign values to. Most of these are value judgments about what is important to people. MV will have to think about the choices that emerge in any one given concept between the operational risk and the things the community wants to do.
Some LGPAC members were uncomfortable with the decision-making process and did not feel that the objectives or the criteria that MV was using had been accepted by the community. It would be good to understand and get comfortable with the decision-making process and the criteria involved.	Let’s discuss these as we go through.
Exercise 1: Individual Swing Weighting	
Objective 2 – Enhance Local Community Integration of the Project	
Sub-objective 2D is not defined in the Objectives Hierarchy and Measurement Scales document.	This is a labelling error. 2E should be labelled 2D and 2F is actually 2E.
How does 2D – potential for public amenities – differ from neighbourhood access?	The potential for public amenities is the sum of a series of binary questions including acoustic suppression from rail tracks, potential for recreation, urban amenities such as coffee shops, plazas, etc. and provision of >10,000m ² of onsite public space.

Issue, Comment, Question	MV Response
If we want to compare how important things are to Objective 1 vs. 2, would this be done through weightings?	For the time being, ignore the other objectives. Later in the exercise, we will be asking you to provide relative weightings for each of the objectives.
Objective 3 – Promote Metro Vancouver’s Sustainability Policy Objectives	
Where is the outfall located?	The location of the outfall will be at the existing location at the Lions Gate Bridge.
Are there alternatives that would not require going back to the existing outfall?	For all 9 Design Concepts, we are assuming the use of the existing outfall.
Objective 4 – Promote Integrated Resource Recovery (IRR)	
With the use of the word “beneficial”, does that mean that the category makes economic sense? Or, are we going to proceed with IRR anyway?	The use of the word “beneficial” here means the word “net” and the economics will be captured in the economics objective.
Is a line item economic when I vote “yes” or do I not know whether it makes economic sense?	You do not know at this point. The business case is not necessarily there.
On 4E – risk of securing source separated organics – MV is currently collecting organics waste biomass on the North Shore and taking it to a digestion facility to extract energy. Why is this a risk? Are we looking at the desirability of doing it?	For single-family homes on the North Shore, the municipalities “own” those feedstocks. However, for multi-family and institutional, commercial and industrial (ICI) sectors, collection is by a private hauler that “owns” the material. They will go where the best cost is from their perspective and we have no control over that. If we build a facility assuming that we are going to get 100% of the food waste from the North Shore and the private haulers decide that they have a better option elsewhere, we are responsible for the capital costs and we will not have the revenue that we were anticipating.
Is it desirable to have the truck traffic transfer the organic material from the LGSWWTP site to a digester?	We want to take all factors into account before deciding if it is desirable or not.
It is likely that there are more than 45 trucks of organic material on the North Shore per week. What does that 45 number mean?	At the moment, the majority of what is collected is yard waste. The yard waste would not be digested because the cellulosic material does not break down in the digesters. We would only be looking at digesting food waste so it is a lot less than the number of trucks that are actually collecting organics on the North Shore.

Issue, Comment, Question	MV Response
Objective 5 – Minimize Costs to Ratepayers	
Is it correct to say that the cost risk is not tied to the technology but rather to operational risk?	Yes, but some technologies are far more vulnerable to those types of risks than others.
What are the risks with the technologies that are being considered in the 9 Design Concepts.	As an example, if you have a technology that is trying to extract a lot of phosphorus and you are assuming a market value for the phosphorus, then that would be more vulnerable to cost risks.
In reference to above comment: That is a management issue.	We are trying to capture the market response to the materials being generated.
Objective-Level Swing Weighting	
Sub-objective 5A is 100% of the capital cost and the cost to operate it and sub-objective 5B is about getting some money back from the residual products. There is currently no money to be made on those residuals so we are investing in the future on those values changing.	Comment noted.
Does sub-objective 5B include unanticipated events, that despite the rigour of this process, we are not going to get what we expect financially?	It is meant to address specifically the cost estimate for the lifecycle cost and the risks that are inherent with those different products in the revenues that we are assuming in these estimates.
Senior government funding is an important category that is missing. There is a risk element in what you assume you will have to spend that will impact on these decisions.	Perhaps it should be a separate item. This is the type of feedback that we want to get from you. We will note this and continue with the analysis.
What is the rate of return on the last increment of investment?	We do not have information at this level of analysis, but we are getting to that deeper level of analysis as we continue with the process.
The question of whether ratepayers are willing to make investments for things that will never pay off is a question that should be there at some point in time.	We will discuss it when we look at the results.
Is the ratepayer cost calculation based on ratepayer paying full costs?	This is just the cost itself. It does not take into account the sources of funding.
Summary Presentation of the Nine Concepts	
“Liquid Treatment Level” in Options 1, 7, 9A and 9B, all indicate that they exceed secondary because of the application of the effluent use under the outfall.	Liquid treatment level is for 100% of the flow. Most of the Concepts meet secondary and Concepts 3 and 4 exceed secondary.

Issue, Comment, Question	MV Response
What is the assumption on the percentage of industrial use?	All options would be the same at about 10% effluent reuse.
Why does Concept 3 say “exceeds secondary” and not Concept 1?	Because Concept 3 is 100%.
Why is it 100% when the industrial use is only 10%? Are you talking about liquid treatment to the outfall?	Yes. That is the question of whether we want to discharge a higher quality effluent to the outfall. If we are not reusing it, is there value in having a higher quality effluent that we can discharge?
Are you satisfied that the toxicity of the solids being produced is not going to be a problem?	Biosolids need to meet specific requirements in order to be used for land application. There are metals and pathogen criteria that must be met.
In Inter-tidal Wetland we have mesophilic digestion. Annacis and Lions Gate both use thermophilic digestion. They both generate gas and they generate a biosolids in which pathogens have been addressed. Why is mesophilic being considered given that you have another treatment stage?	Lions Gate is using thermophilic digestion but it is actually considered a Class B because it is not meeting the metals criteria for Class A. Class B biosolids can be used for land application. The reason that we would consider mesophilic is because it uses less energy, creating a lower heat requirement for mesophilic digestion.
You indicated that Lions Gate does not meet Class A because of the metal concentration. How is this treatment system going to achieve a Class A under Concept 2, which has a thermophilic digester and claims to manufacture Class A biosolids? How is Concept 2 – Living Breathing Organism going to reduce the metal content in the sludge that currently exists?	Due to the technical nature of your line of questioning, let’s continue with the overview and we will speak with you about your questions later. [addressed in informal conversations with the participant during the break]
Exercise 2: Individual Direct Weighting	
The treatment narrative seems immaterial. For example, if site space is important to the community, we can choose a range of technologies that can meet the criteria.	During the afternoon, you will be able to see your results and compare the results of the decision-making under the two systems.
Do parts of Design Concepts 1 through 9 have a different resilience with respect to seismic events?	In terms of seismic vulnerability, all 9 Design Concepts are the same.
In terms of the nutrient removal, what is the advantage of tertiary?	In terms of advanced level treatment, tertiary removes things such as nitrogen from the stream. Another important benefit is that people have heard about pharmaceuticals, hormones and fire

Issue, Comment, Question	MV Response
	retardants that are in consumer products. Some research to date indicates that it has to do with the solids retention time. The technology that we are using for the advanced treatment process has a longer solids retention time so you may be more effectively able to remove those “contaminants of emerging concern” than from the other processes that we are considering that meet secondary treatment.
For Concept 3, is there already a site identified for the offsite sludge co-management?	There is not a specific site identified and no site has been purchased.
Ontario has or was planning to ban landfill application of biosolids because of metal concerns, etc., Is it legal to spread it on farmers’ fields in BC and is there any move to ban that?	Using biosolids on fields is legal and other municipalities are doing it. We are not land applying, so there is an important distinction there. MV is mainly using its biosolids for mine reclamation but we are legally able to apply to farmers’ fields.
Are there cement plants left in the region following implementation of the carbon tax?	There are two cement plants, Lehigh and LaFarge. With the option of sending to the cement kilns, we have assumed that there are other markets so there are other potential energy users of the dried biosolids product and you could use it for fertilizer benefits as well.
Is there any ranking of the nine Design Concepts in terms of being better or worse for odour control?	There is a high level of odour control that is applied to all the alternatives. We would be committed to meeting those high odour control requirements.
Is it possible to go through this process again with more information such as the potential for odour and some of the other questions being asked?	You can do a “gut reaction” or we can hand out a matrix of the criteria and you can base your “gut reaction” on the performance of the different Design Concepts in relation to the objectives.
The testing done on the biosolids before it is applied is very limited and many environmental organizations do not support the application of biosolids to land because there will be some pharmaceuticals locked in there (e.g., endocrine disrupting chemicals which are not yet tested for).	Comment noted.
There are a lot of exemptions to the carbon tax. Not all cement kilns are going out of business.	Comment noted.

Issue, Comment, Question	MV Response
Discussion of Weighting Results and Comparison with Previous Findings	
Concept 5 has interesting merits and looks simpler to a layperson because you have a dissolved air flotation unit as your primary treatment and your primary treatment is where most of your odours come from.	Comment noted.
Where did the numbers come from in the measurement scales and the colour-coded weighting chart?	The colour-coded chart is the result of several months of work by an engineering task team and a community integration task team. On the community integration side, there were meetings with architects and an architectural ecologist. The results were carefully reviewed by MV Senior Engineers Paul Dufault and Laurie Ford.
Concept 2 is being promoted as a GHG sensitive development because it has de-watering and pelletizing biosolids, transporting them to another location where they would be incinerated. How is this ranking arrived at?	The reason that the drying option does well with respect to GHG is because of the assumption that we are displacing the use of coal at the cement kilns and the GHG associated with that.
The ranking does not seem to take into consideration that the equivalent energy value can be generated on site, reducing the biosolids to minimize the truck traffic and reducing energy which also has GHG.	To clarify, with the drying option, we are digesting and then drying so we are generating biogas.
On the issue of IRR, the Fidelis Report used a form of economics that I disagree with. If the economics of IRR is a loss, would IRR have still weighted high? I believe that the only way IRR makes economic sense is to use non-discounted cash flows.	Comment noted.
To go with the assumption that IRR has no economic value discounts that communities and countries around the world have based their wastewater systems on IRR and are using that.	When we first started considering IRR, we asked why IRR is important. If the objective boiled down to money, then IRR disappears because it is a means to an end.
To what extent is MV or any municipality willing to take tax dollars and invest it in something that will lose money over its entire life? I do not agree with that.	Comment noted.

Issue, Comment, Question	MV Response
<p>If you look at all the distribution and we assume that our judgements represent the community, there is no statistical difference between any of the technology solutions. They are all the same. From a parametric statistical perspective, this distribution tells us there is no difference between any of the technologies.</p>	<p>We are using this as a demonstration for conversation purposes.</p>
<p>Swing Weighting</p>	
<p>How is the weighting coming through in terms of preference from one approach to another? My rankings don't necessarily match with what I think.</p>	<p>This is why discussion is important. Now is your chance to tell us if it does not reflect it and why.</p>
<p>If you look at Concept 7 – Urban Garden or Concept 8 – Urban Ecology and the land availability, that land is still available as economies and technologies improve to recover those resources. They do not preclude it. If those were described as being available for IRR in the future, it is possible that those individuals from the previous group would have ranked those higher as well. I see the value of having small infrastructure that can be taken out and replaced as needs change as a key advantage.</p>	<p>That is very much a part of the discussion that we are having.</p>
<p>Key Trade-offs Requiring Input</p>	
<p>Liquids Treatment</p>	
<p>Why is Objective 3B coloured red when it indicates that it meets the regulatory requirements? Why is the cost higher in the estuary pockets model?</p>	<p>The colour coding shows the range across the other alternatives in the row. It turns red because it is the worst one in the row. Red does not mean bad; it is just the worst of the options being considered.</p>
<p>There are fallacies in the analysis. One is that membrane bio-reactors are the only option for tertiary treatment for reuse water quality. There are less expensive technologies available.</p> <p>To meet the federal regulation, we are going to cut BOD by 90% to 25 ppm. Going to 10 or 15 ppm to meet the advanced reuse standard is a very small amount of benefit to the environment.</p> <p>Scenario C presents a problem because it is necessary to have a secondary release mechanism</p>	<p>Your point is that the benefits are not worth the additional investment required. You can achieve some of those benefits simply through the application of the technology and BOD is not that significant.</p> <p>The idea is to keep in mind what the objectives are. Some people in this room have weighted these things as something more than zero so it is that trade-off question that we want to explore.</p> <p>We hear you that you think Scenario C, as originally derived, is impossible. That Scenario C (modified)</p>

Issue, Comment, Question	MV Response
for disposal for water reuse, which means the outfall cannot be abandoned in favour of surface discharge.	may be possible but the benefits of doing it are not there, in your opinion.
With cost comparisons if Scenario B is close to Scenario C, or Scenario C (modified), the implication is that Scenario C (modified) does not deal with co-generation but Scenarios A and B do so the cost comparison becomes bias.	The costing is only related to the secondary treatment train. The co-digestion does not come into this cost. We have separated the liquids component to focus on that particular issue. But there is a trade-off. Even if you put Scenario C to one side, between Scenarios B and C (modified), Scenario B does not provide these additional benefits and it is cheaper. The question is whether it is worth it and what information might you need to understand if it is worth it.
Why didn't you use the same longer list of criteria that you did for the previous assessment?	We started with the long list and we asked "which of the rows is directly affected by the actual liquid side?" We will be doing the same with the solids side.
The benefits and the cost of the first alternative highlighted need to be fleshed out.	Comment noted.
The issue of resilience in the future is important. If there is a drought and no snowpack, people are going to want to reuse water in a hurry.	Comment noted.
It is also a question of what are the alternate uses of that money? It may not be environmental in the strictest sense of the word but they might be environmental from a social policy point of view.	Comment noted.
Does Scenario B have tankage included in the costing that would not be used in future with new technology?	It would be used. We would have deep tank activated sludge that would be used for that process.
Being able to tell the story on what species will come back as a result of creating additional habitat would be very helpful.	Comment noted.
If we spend extra money on this plant, it means that somewhere else in MV that money will not be spent.	Comment noted.
Solids Treatment	
Does NO _x get taken into consideration in Criteria Air Contaminants or in GHG?	Nitrous oxide is a GHG while nitrogen dioxide is not. Nitrogen dioxide is a Criteria Air Contaminant, which has an air quality impact.

Issue, Comment, Question	MV Response
The biggest single risk seems to be that of a biosolids incinerator on the North Shore. What is going to happen if you are burning a substance that repels people in the middle of the North Shore?	There has been very little comment on the potential burning of biosolids. If you think it is an issue, let us recognize it.
Are off-site costs included in Scenario B (modified)? Why would off-site cost be included because you still have off-site costs for Scenario C (modified)?	Yes the off-site costs are included in Scenario B. There is no Scenario C (modified) for the solids treatment train.
Is the fundamental question whether we want co-digestion? There are other methods of handling green waste. If we do not want to do it at all, the cost should not be in the scenarios. With respect to Scenario C in the liquid train, there is no talk about co-digestion so it seems difficult to do comparisons.	We have co-digestion in Scenario A and B. Scenario A is at a second site and Scenario B is on the treatment plant site. Scenario B and B (modified) are a direct comparison of digestion on site with and without food waste and the food waste is being handled completely independently.
Are the numbers of truck volumes return journeys or just one way?	The number does not include the return trip so essentially it would be double the number indicated.
How did you arrive at the net energy use numbers?	There is a process associated with the treatment and we are deducting any avoided energy use.
The issue of the GHG emissions is related to how we are handling the biosolids. That is independent of the wastewater treatment.	They are separated. We are only talking about solids at this point. The previous discussion was only liquids.
Is the odour nuisance measurement the number of occurrences or some degree of intensity?	The odour number is looking at intensity and frequency.
Is it correct that the odour indicator is not a quantitative analysis number?	That is right. It is a subject measure by an odour professional.
How do we assess which option has the least offensive level of odour? I may be prone to accept a higher frequency if they are less intense.	This is a very key issue. Aggregating frequency and intensity is complex.
Mayor Mussatto said at a public meeting that there would be no odour.	<i>[Note: the public meeting comment attributed to Mayor Mussatto was made by Fred Nenninger from MV]</i> These are risks. Some technologies inherently have greater risks of operational errors leading to the escape of odour. In addition, some technologies do generate more intense odours than others.
A response to how chronic odour problems would be dealt with and who would be responsible for correcting the problem and bearing the cost should be on your FAQs.	Comment noted. MV will update their FAQs to address this issue.

Issue, Comment, Question	MV Response
Next Steps	
The next step in the process should be a scenario analysis, looking at the issues that could have a significant impact, to assess the robustness of the plans.	Comment noted.
Concern that the community is not fully aware of the potential impact of IRR to the cash flows of the project.	Comment noted.
Concern that an adequate level of rigour is applied to expectations. Expectation vs. cost level sensitivity should be applied on key issues of concern to the public and the politicians such as odour and trucks.	Comment noted.
General	
We are dealing with nine scenarios that may or may not have an application.	Laurie Ford will go into the Design Scenarios later in the agenda.
Will the discussions on long-term funding be dealt with as part of this process or will it be dealt with down the road?	Funding aspects will be dealt with in a parallel process to the technical work that will be brought to the Utilities Committee and the MV Board for consideration. It will come together with the technical work as part of this project. We will be able to report out on the progress of the funding following the meeting with the MV Utilities Committee at the end of June 2013.
MV should consider potential problem analysis as a formal part of this process. What can go wrong, what can we do to prevent it and what do we do if it does go wrong?	Comment noted.

Reference Material Distributed to Workshop Participants

1. Agenda for Structured Decision-Making Workshop, May 31, 2013
2. Lions Gate Secondary Wastewater Treatment Plant Objectives Hierarchy and Measurement Scales
3. Document with “Direct Ranking” and “Swing Weighting” subsections, referred to as the “Weighting Form”
4. Colour-coded chart of the relative risks associated with each of the sub-objectives of the design concepts
5. Lions Gate Secondary Wastewater Treatment Plant Design Concepts and Build Scenarios
6. Summary Table for 9 Design Concepts
7. Summary Table for 3 Build Scenarios

Attendance

LGPAC Members: Christine Banham (Chair), John Hunter, David Knee, Louise Ranger, Diana Sollner, Peter Thompson, Tracy Tilscher, Jan Timmer, Troy Vassos, Brian Walker, Christiane Wilhelmsen

CRF Members: Deborah Carlson, Dan Ellis, Amanda Nichol, Kim Stephens, Hamed Tahari

Metro Vancouver Resources: Laurie Ford (MV), Marie Griggs (MV), Graham Long (Compass Resource Management), Jaspal Marwah (MV), Fred Nenninger (MV), Joy William (MV), Taylor Zeeg (Compass Resource Management)

Process Facilitator: John Forsdick, Context Research

Recording Secretary: Carol Lee, Raincoast Ventures Ltd.