IONA ISLAND WASTEWATER TREATMENT PLANT
PROJECT DEFITION UPDATE
COMMUNITY MEETING SUMMARY
OCTOBER 12 & 14, 2021

This is a combined summary of the Iona Island Wastewater Treatment Plant (IIWWTP) Project Definition Update (Meeting) Community meetings held October 12 and 14, 2021 via videoconference.

The list of Meeting participants is included in Appendix A.

1. Meeting Overview

- Review of the July 2020 concept design and subsequent challenges identified
- How Metro Vancouver is addressing the challenges
- Proposed treatment plant options being evaluated
- Priority delivery activities currently underway
    - Ecological restoration projects
    - YVR updates
- Next steps for engagement and Project Definition Report finalization

2. Discussion

The following table summarizes, by topic, the responses to questions and comments provided by participants from both October 12 and October 14 Meetings.

YVR Issue, Comment, Question	Metro Vancouver (MV) Response
IIWWTP Treatment Plant	
Given the huge extra cost, has there been any thoughts to relocate the Project?	In 2008-2009, Metro Vancouver (MV) conducted a study on potential alternate locations for the treatment plant. This study also looked at distributed locations involving smaller treatment plants over the Vancouver Sewerage Area instead of in one single location. Results from that study determined that the best option, on both financial and non-financial criteria, was to upgrade the existing treatment plant and proceed with the upgrade at Iona. Given the cost challenges identified and in particular, the high cost of ground improvements, the findings of the 2009 report were reviewed again by the PDR Design Team, and have concluded that Iona Island remains the recommended location for the wastewater treatment plant.

There was discussion of the cost of seismic upgrades. Has there been specific consideration of the costs of sea level rise and climate change?	Yes, MV has included work to account for sea level rise and climate change resiliency measures into the project cost estimate. MV will be raising the Project site to protect it from sea level rise in the future. MV is bringing the site up substantially to prepare for future sea level. The ecological restoration projects will also address the impacts of sea level rise.
Can you explain the impacts of the four-year delay from the regulatory deadline?	MV's intent is to complete this work as soon as possible. MV is now moving forward on all priority delivery activities and on advancing the design concept.
Will the plant be out of compliance of the secondary treatment regulatory deadline for 4 years as indicated on the *design concept delivery schedule* presentation slide? If so, what will be the impacts of noncompliance?	Metro Vancouver is communicating closely with Environment and Climate Change Canada and is providing regular updates on the project schedule, including the anticipated completion date. MV will continue to review the progress of the Project with the federal and provincial government as well as work to advance the schedule as quickly as possible.
Has an independent estimate and risk quantification review been done outside the project team?	Yes, MV has engaged several different independent reviews on the technical, cost and risk aspects of the project. External panelists have also provided recommendations to address the issues and challenges identified with the July 2020 board concept, as outlined in the July 2021 Board report.
How much confidence is there on the current 10.4 billion estimate?	Given the level of design, the cost estimated presented is classified as a Class 3 cost estimate. In the last year, MV implemented new Best Practice Cost Estimating Framework that addresses some of the challenges in estimating future costs on large, complex and lengthy projects, in order to provide more complete estimates which, consider risk, contingency, uncertainties and escalation of costs over time. MV will be doing further work on the estimate and risk reserve associated with the proposed alternate options before the Project Definition Report (PDR) is finalized.

What is the additional cost of choosing the world class tertiary treatment process I pointed out is being used at the Orange Country California treatment plant, compared to the lower quality tertiary treatment process now used at the Brightwater treatment plant that MV has proposed for consideration?	The Orange County Groundwater Replenishment System is an advanced treatment system and represents the next level of treatment beyond secondary. The Orange County system includes reverse osmosis followed by advanced oxidation and the treated water is pumped to injection wells and percolation basins to augment the local groundwater aquifers, which are used as a source of drinking water. At the Iona Island Wastewater Treatment Plant, the first stage of upgrades will raise the level of treatment from primary to secondary. In order to achieve the type of advanced treatment that the Orange County system uses, significantly higher capital and operations and maintenance costs would be needed.
If there is only one supplier with Aerobic Granular Sludge (AGS) technology, how do you negotiate with the supplier if you already have decided to use that technology?	One of MV's objectives is to incorporate market competition into the procurement process where possible. To meet the treatment technology selection objective, MV is considering carrying two secondary treatment options Membrane Bioreactor (MBR) and Aerobic Granular Sludge (AGS) forward to a stage where MV can also address commercial considerations with the technology selection. One negotiation option is to set up a procurement strategy, where both MBR and AGS technologies can compete based on established commercial, financial and technical criteria. However, more work is required to determine which technology is preferred. The procurement limitation around AGS is an important criteria and more work is being done now to determine best how to address supplier limitations. By the time final technology section is made, more suppliers may come on the market. Given the viability and potential of this technology, MV may have more suppliers in the market who can supply the equipment for the treatment plant.

Is there E. coli and bacteria sampling in the Salish Sea (beyond Iona beach) as part of baseline sampling?	The Environmental Management and Quality Control Division of Liquid Waste Services conducts water quality monitoring including bacteria (*Escherichia coli, Enterococci and Fecal coliforms*) at ambient sites in the Salish Sea and in the vicinity of the Iona Island Wastewater Treatment Plant deep sea outfall, in addition to recreational water quality monitoring at Iona Beach and several Wreck Beach locations. Results for Iona Island WWTP, Strait of Georgia and beach monitoring are summarized in the EMQC annual reports, which can be found at the following link: Annual Reports (metrovancouver.org)
Why is dewatering taking so long?	IIWWTP has a large volume of historic biosolids onsite, both as sludge in the lagoons and as a solid soil-like material in a stockpile. The biosolids lagoons and stockpile are now being removed to prepare those areas for construction of the future treatment plant. The sludge from the lagoons must be mechanically dewatered before removal from the site. Construction of a concrete pad and electrical supply are required for the dewatering equipment. Permitting for this construction work and procuring electrical components took longer than anticipated. Construction is now underway with dewatering scheduled to begin in 2022. Due to the large volume of biosolids in the lagoons [and stockpiles], it will take several years to move the biosolids offsite to beneficial use projects. Cleared areas will be handed over to the IIWWTP projects on an ongoing basis so that the overall project schedule is not delayed.
Has a construction firm been selected for any of these phases yet? Concerned about what happened on the North Shore Wastewater treatment plant STOP.	No construction firm has been selected for any of these phases yet. Contractor (s) will not be selected until MV moves forward with the design advancement. The North shore treatment plant used a different delivery method than what is being considered for Iona.

What is the final effluent quality for the proposed disc filter system in terms of total suspended solids (TSS), biological oxygen demand (BOD) and chemical oxygen demand (COD)?	The proposed disc filtration process will be installed downstream of the AGS process should it be selected. If MBR is selected, the disc filters are not required as the MBR process already incorporations a filtration step. TSS and BOD are two regulated parameters in MV's operational certificate. TSS and BOD will be in the order of less than 10 milligrams per liter in the effluent for both AGS and MBR options. COD isn't regulated in MV's operational certificate and therefore is not consistently measured.
Who is currently the general contractor on the project?	MV does not have a general contractor contracted at this early project definition phase. The IIWWTP projects may not involve one general contractor to oversee the entire project because it comprises of multiple separate projects.
What is the population estimate for 2100 being used for the design?	Two of the key population estimates governing the design are 950,000 people by 2051 at the Vancouver Sewerage and then in 2101 the population estimate is 1.25 million.
Can you explain the process you will use to determine which design option will ultimately be selected? What criteria are used?	MV developed a structured decision-making (SDM) process to evaluate the options. This SDM includes a list of approximately 50 criteria ranging in financial, technical, social, environmental, that are used to determine which is the preferred option and what trade-offs would remain. Trade-offs need to be considered when decision makers are weighing the options. For example, even though the MBR has many pros, some of the MBR components have potential costly environmental implications during operations, such as higher energy demand and membranes that require replacement every 10-12 years. In comparison, the AGS technology has a trade-off tied to procurement and competition challenges. At this time there is only one primary supplier on the market available to supply this technology.

What's the capital, operations and maintenance, and lifecycle cost differences among these four options?	MV is currently analyzing these costs. These costs will be included as part of the recommendations that staff will share with the Board in November and these estimates will be further refined before the PDR is finalized in early 2022. Following the reports and presentations to GVS&DD Board, this information will be publicly available on MV's website.
Do you include a cost of carbon in the review of options?	Yes, MV included a cost of GHG emissions released during plant construction and operations. MV also considered the GHG offsets available though the generated natural biogas that will be connected and supplied to the gas grid, considered a renewable natural gas.
Which technology is considered financially feasible?	All of the proposed treatment technologies are financially feasible. The cost differences between these technologies will be analyzed and evaluated before the project team makes a recommendation to the Board in November.
Is the AGS technology confined to one supplier because of a patent? And, if so when does that expire?	There are several patents that are combined to define the AGS technology process. These patents likely expire at different periods. Industry competition may evolve as one component of the patent expires and alternate suppliers develop a similar component to fulfill demand. MV expects this technology to advance as different suppliers develop products that can compete with the AGS technology.
Will contractors be able to propose alternative consolidation methods to speed up the ground improvement works?	Metro Vancouver has established performance objectives for the plant that are associated with different aspects of the projects including ground improvements works. For example, a performance objective example may require ground improvements designers to evaluate different methodologies that will determine how the treatment plant will need to operate following a seismic event. Once trade-offs and a cost benefit analysis are factored into these methodologies, a preferred

	methodology will be selected and incorporated into the tender documents. These tender documents are then distributed to bidding contractors, and the selected contractor will implement the selected methodology. As an organization, MV focuses on establishing the objectives and then consults with industry experts to confirm how we can meet those objectives through one of the many available methodologies.
Given what has recently occurred with the North Shore Wastewater Treatment Plant, how will this shape how you will procure services to deliver the Iona Wastewater Treatment Plant projects?	MV and the Board are aware of the challenges on the North Shore Wastewater Treatment Plant project, which could influence the procurement delivery method on the IIWWTP projects. MV is actively working to address some of the constructability challenges identified with the IIWWTP projects and is currently exploring the flexibility of procuring the construction work in several different packages rather than one or more very large contracts. This approach is a consideration that will be included in the PDR and as the design and procurement progresses.
Do the people on the panel risk having a conflict of interest if their company ends up on the short list for some of the contracts?	The panel of experts comprises of a small group of independent global wastewater experts from a relatively small industry. These panelists provide independent advice that has helped shape this project. There is no conflict of interest risk, given that all future contracts for the various projects are subject to a competitive procurement process. The panelists are committed to helping select the best project option for Metro Vancouver and the region's ratepayers.
Does the treatment technology need to be decided before the final project definition can be done?	No, the treatment technology doesn't need to be finalized before completion of the PDR. MV may choose to keep the secondary treatment technology flexible as we move through to the next phases. As shown the layouts, other remaining facilities required at the plant and the other works planned on the island are largely independent of the secondary treatment technology.

Ecological Restoration Projects	
The images we're seeing show paths between all of the pond areas. We know that birds currently use the inner ponds, where access is restricted much more than the outer ponds, particularly at high tide. Would you consider eliminating some of the paths to provide birds with more refuge areas away from people and (especially) dogs?	Since the start of the design work, MV has considered eliminating some of the paths to provide birds with more refuge areas. Currently a large portion of Iona Island is off limits to dogs (and where dogs must be leashed). As the design process moves forward, MV can also consider areas where dogs could be completely excluded, such as protected areas around the ponds and where dogs must be leashed.
I applaud MV for being so conscious of the environment and its importance.	Comment noted.
Is the impact on the North Arm of the Fraser shoreline being considered or investigated?	Hydrodynamic modelling and sediment evaluation will be undertaken to look at the effect of the proposed foreshore ecological restoration projects on surrounding ecosystems and infrastructure, including climatic conditions such as wind on wave events and sea level rise. The study area for the modelling has not yet been fully defined, but we expect it to include Iona Island and the surrounding area, such as the North Arm, McDonald Slough, the North Arm Jetty, inter jetty area, Sturgeon Bank, Musqueam Marsh, and UBC Point Grey cliffs. Updates about project activities, including studies and modelling to inform design work, will be provided as available in our quarterly project update email newsletters. Sign up for IIWWTP project update newsletters here. Please note that there will also be further engagement opportunities during the design phase that will follow project definition, including chances to provide input into the freshwater, foreshore, and terrestrial ecological restoration projects as Metro Vancouver continues to refine the design. Upcoming engagement opportunities will be shared on the project webpage as well as in our quarterly email newsletters and we look forward to your participation.

Is there going to be any funding available to allow studies by NGOs and student groups of wildlife at the plant in the future?	MV currently works with partner groups that MV does not fund. Projects like this study is by NGOs. This is a long term project spanning over 10 years. At this stage MV hasn't worked out all of the details, but MV recognizes that research partnerships is an important component and MV would like to work with the groups and academics associated with Iona Island and the Fraser River estuary to foster research. Noted that MV does also offer in-kind support at times. MV looks forward to working with partners and groups throughout the IIWWTP projects.
Many dog owners do not respect posted signs.	Comment noted.
What kind of baseline bird surveys is MV collecting right now? Please explain the (season(s), group of species, survey type, etc…)?	MV staff are currently assessing baseline survey and study requirements for the ecological restoration projects to support pre, during and post treatment assessment, restoration design development, permitting, and adaptive management. This will include baseline studies for hydrology, vegetation, birds and many other taxa in and around the island. The seasons, survey intensity, species groups and other specifics are currently under development. Additionally, in the foreshore area, MV will soon be undertaking hydrodynamic modelling and sediment transport evaluation, and biophysical data collection to evaluate the effect of the proposed restoration projects on surrounding ecosystems, inform the design of restoration areas, and to establish baseline conditions. Surveys of intertidal habitats, sediment characterization, water quality, fish and waterbirds are part of this work.
Will MV consider surveys for land birds too given that Iona Island is an important stopover site for a great diversity of migratory land birds?	MV prioritized initiating the surveys and studies for the foreshore projects near the causeway area because investigating the feasibility of replacing the causeway with a bridge is a complex priority project. MV is also currently assessing baseline survey and study

	requirements, and long-term monitoring requirements for the freshwater and terrestrial ecological restoration projects. To better understand this, prior to any work taking place, MV will engage with experts and professionals in different fields to assess a full suite of biophysical parameters, including landbirds. All of this work is early in the planning stages, but will be further developed in 2022.
Understands that there was plans to place a bridge on the causeway. What is the timing on that structure?	The existing causeway is the only access to Iona Island, the IIWWTP and Iona Beach Regional Park. MV's desire is to begin construction on the causeway breach as early as possible, but the timing will depend on permitting, ensuring consistent access to the Island, and that works do not impede the IIWWTP construction schedule. MV will soon be undertaking hydrodynamic modelling and sediment transport evaluation, and biophysical data collection to evaluate the effect of removing the causeway and replacing it with a bridge on the surrounding ecosystems, to inform the design of restoration areas, and to establish baseline conditions. This preliminary work is to inform project feasibility, support engagement, and permitting and approvals, as well as to refine the project schedule.
Has there been planning consideration to ensure there is sufficient habitat for migratory birds during construction?	There is consideration in that the sludge lagoon areas, currently used by migratory birds, will be transitioned to wetland habitat and Park. MV is also conducting a hydrology study to understand the hydrological dynamics of the ponds and sludge lagoons, and to understand the effect on lagoon water levels after sludge is no longer added to the lagoons. Design guidelines for the IIWWTP will also consider measures to protect neighbouring sensitive ecosystems, and habitat, and to mitigate construction impacts, such as noise, light, dust, and erosion.

One of your ecological priorities is to "Improve Water Quality" in the Salish Sea and the Federal Government has jurisdiction over marine waters, including protecting the threatened Orca populations. Therefore, could MV appeal to their desire to enhance public perception of their Orca-protection efforts? That might convince them to contribute the additional cost of implementing world-class tertiary treatment, in order to ensure the highest ecological purity of the outfall being discharged into the Orca's habitat.	Studies related to sediments and water movement around the island are included in early stages of project development. The proposed level of treatment for the Project is aligned with receiving water body requirements and associated regulatory requirements. The current proposed treatment concepts include secondary and tertiary level treatment with the flexibility to migrate to more advanced technologies in the future. MV is aligned with the Federal and Provincial requirements for this project, with the anticipated delay that has been identified and communicated. As potentially more stringent requirements are established in the future, the plant will be able to adapt to those requirements with the subsequent expansions scheduled for 2051.
I work in ecological restoration and marsh conservation. I have worked in the marsh alongside the Iona Island causeway and Sea Island so this issue is close to my heart. Is there any chance that Metro Vancouver will backtrack on the commitment to upgrade to tertiary treatment?	MV intent is to advance the IIWWTP treatment level to tertiary treatment.
A graph earlier showed the ecological projects starting in 2023. Are jetty breaches and invasive species removal not already ongoing, or are these not MV related?	Raincoast Conservation Foundation is currently planning to construct multiple breaches on the North Arm Jetty in 2022 and 2023. MV is providing in-kind support to Raincoast for these projects, for example MV hosted a community engagement session and will be investigating the potential to reuse the sediment removed from one of the breaches for the IIWWTP projects. At Iona Beach Regional Park, ecological restoration and invasive species management is ongoing. The suite of planned IIWWTP ecological restoration projects planned in Iona Beach Regional Park will align with and substantially build on current restoration activities at the Park, which is why the timeline shows 2023/2024 as the start of the IIWWTP ecological restoration projects.

I take my 9ft boat all the way around sea island monthly (at over 50km a round trip). Does MV have any water lots that can have log storage removed to restore habitats?	There are approximately nine water licenses around Iona Island which are managed by the Provincial Government. The Provincial Ministry of Forests, Lands, Natural Resource Operations and Rural Development manages the Fraser River Transition Area, including temporary licences for log storage. MV has started discussions with FLNRORD and the licence holder storing logs in the area to explore how MV can approach the restoration work and breaches, and the potential impacts of these ecological restoration projects to nearby log storage.
What happens to the log booms that are currently located in some of the restoration areas?	The log booms may need to be adjusted either temporarily as works are happening or potentially permanently depending on the proximity to the causeway breach-bridge. The upcoming hydrodynamic modeling and biophysical baseline work will help to inform needs.
Will the breach under the outfall pipe be accessible at high tide or at some other tide stage?	The outfall jetty extends through Sturgeon Bank and due to its location it impedes movement of aquatic species, freshwater and sediment between the inter-jetty area. It's also an important piece of infrastructure for wastewater management and public recreation. In the July 2020 GVS&DD Board report the outfall breach project was proposed as a potential future project beyond the timeframe of the current IIWWTP upgrade projects. Engineering feasibility and studies on the ecological effects would be required in the future to better understand the project scope and viability, and to answer questions such as tidal influence.
Has an evaluation been conducted on how ecological changes will affect the size and species, for example, Brant Geese vs. Sandpiper, and their literal impact with aircraft at YVR?	MV will soon be undertaking hydrodynamic modelling and sediment transport evaluation, and biophysical data collection to evaluate the effect of the foreshore ecological projects on the surrounding ecosystems, to inform the design of restoration areas, and to establish baseline conditions. Wildlife aviation hazard assessment of the restoration area designs,

	and landscape recommendations to mitigate wildlife aviation hazards are part of this work.
I'm really excited about the proposals to connect all the channels that used to be there.	Comment noted
What is the sea level rise assumption for 2100?	For the Iona Island area, the relative sea level is projected to rise approximately 1 m to 1.6 m or more by 2100.
[Final remarks by participants] A great presentation. All topics well defined and look forward to future discussions THANK YOU!! Thank you for the presentation. Much appreciated. Thank you! Thank you! Thank you!	

Ms. Candido (MV) thanked the Meeting participants for their contributions. She noted that additional thoughts and input can be submitted to ionawwtp@metrovancouver.org by October 22, 2021 for consideration in the development of the recommendation to the MV Liquid Waste Committee and GVS&DD Board in November 2021.

The Meetings concluded at (October 12, 2021) 1:25 p.m. and (October 14, 2021) 8:21 p.m.

APPENDIX A –LIST OF STAFF AND RESOURCES

Staff and Resources:

Brett Young	Metro Vancouver
Marek Ratajczak	Metro Vancouver
Lea Elliott	Metro Vancouver
Tom Sadleir	Metro Vancouver
Sabrina Scalena	Metro Vancouver
Nelson Szeto	Metro Vancouver
Sylvia Pendl	Metro Vancouver
Deanna McGillivray	Metro Vancouver
Michelle Candido	Metro Vancouver
Tina Chiu	Metro Vancouver
Rick Bitcon	AECOM