

**GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT (GVS&DD)
BOARD OF DIRECTORS**

REGULAR BOARD MEETING

Friday, February 25, 2022

9:00 A.M.

Meeting conducted electronically pursuant to the Procedure Bylaw
28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia
Webstream available at <http://www.metrovancouver.org>

[Membership and Votes](#)

A G E N D A¹

A. ADOPTION OF THE AGENDA

1. February 25, 2022 Regular Meeting Agenda

That the GVS&DD Board adopt the agenda for its regular meeting scheduled for February 25, 2022 as circulated.

B. ADOPTION OF THE MINUTES

1. January 28, 2022 Regular Meeting Minutes

That the GVS&DD Board adopt the minutes for its regular meeting held January 28, 2022 as circulated.

2. February 3, 2022 Special Meeting Minutes

That the GVS&DD Board adopt the minutes for its special meeting held February 3, 2022 as circulated.

C. DELEGATIONS

D. INVITED PRESENTATIONS

E. CONSENT AGENDA

Note: Directors may adopt in one motion all recommendations appearing on the Consent Agenda or, prior to the vote, request an item be removed from the Consent Agenda for debate or discussion, voting in opposition to a recommendation, or declaring a conflict of interest with an item.

¹ Note: Recommendation is shown under each item, where applicable. All Directors vote unless otherwise noted.

1. LIQUID WASTE COMMITTEE REPORTS

1.1 Northwest Langley Wastewater Treatment Plant Expansion Program – Ground Improvements & Preload Project Update

That the GVS&DD Board receive for information the report dated February 18, 2022, titled “Northwest Langley Wastewater Treatment Plant Expansion Program – Ground Improvements & Preload Project Update”.

1.2 Award of Phase C2 Engineering Construction Services RFP No. 14-163 for the Installation of Burnaby Lake North Interceptor No.2 – Winston St Ph. 2 – Trenchless Section

That the GVS&DD Board:

- a) approve award of Phase C2, Engineering Construction Services, for an amount of up to \$4,227,265 (exclusive of taxes) to the Phase A, B and C1 consultant, AECOM Canada Ltd, for the Installation of Burnaby Lake North Interceptor No.2 – Winston St Ph.2 – Trenchless Section, subject to final review by the Commissioner; and
- b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

Revised 1.3 Award of Contract Resulting from RFQ No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project

That the GVS&DD Board:

- a) approve the award of contract RFQ No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project to PCL Constructors Westcoast Inc, Contract 1 for Early Contractor Involvement and Construction Management Services estimated at \$40 million, subject to final review by the Commissioner; and
- b) authorize the Commissioner and Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

2. CLIMATE ACTION COMMITTEE REPORTS

2.1 2022 Liquid Waste Sustainability Innovation Fund Application

That the GVS&DD Board approve the allocation from the Liquid Waste Sustainability Innovation Fund of \$270,000 over two years starting in 2022 for Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project.

F. ITEMS REMOVED FROM THE CONSENT AGENDA

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

I. OTHER BUSINESS

1. GVS&DD Board Committee Information Items and Delegation Summaries

J. BUSINESS ARISING FROM DELEGATIONS

K. RESOLUTION TO CLOSE MEETING

Note: The Board must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

That the GVS&DD Board close its regular meeting scheduled for February 25, 2022 pursuant to the *Community Charter* provisions, Section 90 (1) (e) and (i) as follows:

“90 (1) A part of a board meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

- (e) the acquisition, disposition or expropriation of land or improvements, if the board or committee considers that disclosure could reasonably be expected to harm the interests of the regional district; and
- (i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose.”

L. RISE AND REPORT (Items Released from Closed Meeting)

M. ADJOURNMENT/CONCLUSION

That the GVS&DD Board adjourn/conclude its regular meeting of February 25, 2022.

**GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT
BOARD OF DIRECTORS**

Minutes of the Regular Meeting of the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board of Directors held at 1:48 p.m. on Friday, January 28, 2022 in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:

Burnaby, Chair, Director Sav Dhaliwal
 North Vancouver City, Vice Chair Director
 Linda Buchanan*
 Anmore, Director John McEwen*
 Belcarra, Director Jamie Ross*
 Bowen Island, Director David Hocking*
 Burnaby, Director Pietro Calendino*
 Burnaby, Director Mike Hurley*
 Coquitlam, Director Craig Hodge*
 Coquitlam, Director Richard Stewart*
 Delta, Alternate Director Bruce McDonald* for
 George Harvie
 Delta, Director Dylan Kruger*
 Electoral Area A, Director Jen McCutcheon*
 Langley City, Director Gayle Martin*
 Langley Township, Director Jack Froese*
 Langley Township, Director Kim Richter*
 Lions Bay, Director Ron McLaughlin*
 Maple Ridge, Director Mike Morden*

New Westminster, Director Jonathan Coté*
 North Vancouver District, Director Lisa Muri*
 Pitt Meadows, Director Bill Dingwall*
 Port Coquitlam, Director Brad West*
 Port Moody, Director Rob Vagramov*
 Richmond, Director Malcolm Brodie*
 Richmond, Director Harold Steves*
 Surrey, Director Doug Elford*
 Tsawwassen, Director Ken Baird*
 Vancouver, Director Christine Boyle*
 Vancouver, Director Adriane Carr*
 Vancouver, Director Melissa De Genova*
 Vancouver, Director Lisa Dominato*
 Vancouver, Director Colleen Hardwick*
 Vancouver, Director Michael Wiebe*
 West Vancouver, Director Mary-Ann Booth*
 White Rock, Director Darryl Walker*
 Commissioner Jerry W. Dobrovolny (Non-voting
 member)

MEMBERS ABSENT:

Surrey, Director Linda Annis
 Surrey, Director Laurie Guerra
 Surrey, Director Mandeep Nagra

Surrey, Director Allison Patton
 Surrey, Director Doug McCallum

STAFF PRESENT:

Katie Karn, Deputy Corporate Officer
 Manveer Atwal, Legislative Services Coordinator, Board and Information Services

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

A. ADOPTION OF THE AGENDA

1. January 28, 2022 Regular Meeting Agenda

It was MOVED and SECONDED

That the GVS&DD Board adopt the agenda for its regular meeting scheduled for January 28, 2022 as circulated.

CARRIED

B. ADOPTION OF THE MINUTES

1. November 26, 2021 Regular Meeting Minutes

It was MOVED and SECONDED

That the GVS&DD Board adopt the minutes for its regular meeting held November 26, 2021 as circulated.

CARRIED

2. January 18, 2022 Special Meeting Minutes

It was MOVED and SECONDED

That the GVS&DD Board adopt the minutes for its special meeting held January 18, 2022 as circulated.

CARRIED

C. DELEGATIONS

No items presented.

D. INVITED PRESENTATIONS

No items presented.

E. CONSENT AGENDA

It was MOVED and SECONDED

That the GVS&DD Board adopt the recommendations presented in the following items as presented in the January 28, 2022 GVS&DD Board Consent Agenda:

- 1.1 2022 Liquid Waste Capital Projects
- 1.2 Grant Funding Application for the North Surrey Interceptor Flow Management Sanitary Sewer Overflow Tank
- 2.1 Flood Emergency Response: Regional Solid Waste System Impacts Summary
- 2.2 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

CARRIED

The items and recommendations referred to above are as follows:

1.1 2022 Liquid Waste Capital Projects

Report dated December 24, 2021, from Colin Meldrum, Director, Engineering, Design & Construction, Liquid Waste Services, informing the GVS&DD Board of the liquid waste capital projects under its purview for 2022, as approved by the Board on October 29, 2021.

Recommendation:

That the GVS&DD Board receive for information the report dated December 24, 2021 titled “2022 Liquid Waste Capital Projects”.

Adopted on Consent

1.2 Grant Funding Application for the North Surrey Interceptor Flow Management Sanitary Sewer Overflow Tank

Report dated January 6, 2022, from Colin Meldrum, Director, Engineering, Design and Construction, Liquid Waste Services and Jean Lawson, Program Manager, Intergovernment Relations, External Relations, seeking the GVS&DD Board’s endorsement for a grant application to the Investing in Canada Infrastructure Program – Environmental Quality program for the NSI Flow Management Sanitary Sewer Overflow Tank.

Recommendation:

That the GVS&DD Board endorse an application for grant funding of \$27 million for the North Surrey Interceptor Flow Management Sanitary Sewer Overflow Tank through the Investing in Canada Infrastructure Program – Environmental Quality, in which case, if successful in receiving funding, GVS&DD would be responsible for its share, which would total \$67.5 million of the Project’s total cost (\$94.5 million), as well as cost overruns.

Adopted on Consent

2.1 Flood Emergency Response: Regional Solid Waste System Impacts Summary

Report dated January 13, 2022 from Chris Allan, Director, Solid Waste Operations, providing Zero Waste Committee with an update on the Metro Vancouver’s response to recent flood events and system impacts resulting from the flood emergency in November 2021.

Recommendation:

That the GVS&DD Board receive for information the report dated January 13, 2022, titled “Flood Emergency Response: Regional Solid Waste System Impacts Summary”.

Adopted on Consent

2.2 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Report from Terry Fulton, Senior Project Engineer, Solid Waste Services, providing the Zero Waste Committee with the draft 2021 Biennial Report on progress for the Integrated Solid Waste and Resource Management Plan.

Recommendation:

That the GVS&DD Board direct staff to:

- a) invite feedback on the draft 2021 Integrated Solid Waste & Resource Management Plan Biennial Report from public stakeholders and Indigenous Nations; and
- b) submit the 2021 Integrated Solid Waste & Resource Management Plan Biennial Report and feedback to the Ministry of Environment and Climate Change Strategy.

Adopted on Consent

F. ITEMS REMOVED FROM THE CONSENT AGENDA

No items presented.

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

No items presented.

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

No items presented.

I. OTHER BUSINESS

1. GVS&DD Board Committee Information Items and Delegation Summaries

It was MOVED and SECONDED

That the GVS&DD Board receive for information the GVS&DD Board Committee Information Items and Delegation Summaries, dated January 28, 2022.

CARRIED

J. BUSINESS ARISING FROM DELEGATIONS

No items presented.

K. RESOLUTION TO CLOSE MEETING

It was MOVED and SECONDED

That the GVS&DD Board close its regular meeting scheduled for January 28, 2022 pursuant to the *Community Charter* provisions, Section 90 (1) (e) as follows:

“90 (1) A part of a board meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

- (e) the acquisition, disposition or expropriation of land or improvements, if the board or committee considers that disclosure could reasonably be expected to harm the interests of the regional district.”

CARRIED

L. RISE AND REPORT (Items Released from Closed Meeting)

No items presented.

M. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED

That the GVS&DD Board adjourn its regular meeting of January 28, 2022.

CARRIED

(Time: 1:48 p.m.)

CERTIFIED CORRECT

Katie Karn, Deputy Corporate Officer

Sav Dhaliwal, Chair

50518578 FINAL

**GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT
BOARD OF DIRECTORS**

Minutes of the Special Meeting of the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board of Directors held at 9:04 a.m. on Thursday, February 3, 2022 in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:

Burnaby, Chair, Director Sav Dhaliwal
 North Vancouver City, Vice Chair Director
 Linda Buchanan*
 Anmore, Director John McEwen*
 Burnaby, Director Pietro Calendino*
 Burnaby, Director Mike Hurley*
 Coquitlam, Director Craig Hodge*
 Coquitlam, Director Richard Stewart*
 Delta, Director George Harvie*
 Delta, Director Jeannie Kanakos*
 Electoral Area A, Director Jen McCutcheon*
 Langley City, Director Gayle Martin*
 Langley Township, Director Jack Froese*
 Langley Township, Alternate Director Petrina
 Arnason* for Kim Richter
 Maple Ridge, Director Mike Morden*
 New Westminster, Director Jonathan Coté*
 North Vancouver District, Director Lisa Muri*
 Pitt Meadows, Director Bill Dingwall*
 Port Coquitlam, Director Brad West*
 Port Moody, Director Rob Vagramov*

Richmond, Director Malcolm Brodie*
 Richmond, Director Harold Steves*
 Surrey, Director Linda Annis * (arrived at
 9:06 a.m.)
 Surrey, Director Doug Elford*
 Surrey, Director Laurie Guerra*
 Surrey, Director Mandeep Nagra*
 Surrey, Director Allison Patton*
 Vancouver, Director Christine Boyle*
 Vancouver, Director Adriane Carr*
 Vancouver, Director Melissa De Genova* (arrived
 at 9:21 a.m.)
 Vancouver, Director Lisa Dominato*
 Vancouver, Director Colleen Hardwick*
 Vancouver, Director Kennedy Stewart*
 Vancouver, Director Michael Wiebe*
 West Vancouver, Director Mary-Ann Booth*
 White Rock, Director Darryl Walker*
 Commissioner Jerry W. Dobrovolny (Non-voting
 member)

MEMBERS ABSENT:

Surrey, Director Doug McCallum

STAFF PRESENT:

Katie Karn, Deputy Corporate Officer
 Manveer Atwal, Legislative Services Coordinator, Board and Information Services

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

A. ADOPTION OF THE AGENDA

1. February 3, 2022 Special Meeting Agenda

It was MOVED and SECONDED

That the GVS&DD Board adopt the agenda for its special meeting scheduled for February 3, 2022 as circulated.

CARRIED

9:06 a.m. Director Annis arrived to the meeting.

B. REPORTS FROM COMMITTEE OR COMMISSIONER

1. Iona Island Wastewater Treatment Plant Projects Conceptual Design

SECTION 1 - Project Background, Need and Benefits

Pam Ryan, External Facilitator, introduced the agenda and the structure for the meeting.

Peter Navratil, General Manager, Liquid Waste Services, spoke to the regulatory requirements of this project along with the benefits and needs to the Greater Vancouver Sewerage and Drainage District.

Cheryl Nelms, General Manager, Project Delivery, provided members with information on the current project status, highlighting how the project will protect public health and the environment.

SECTION 2 - Treatment Plant Upgrade

Beverly Stinson, External Executive VP, AECOM, spoke to members about the project in a global context providing examples of case studies of similar projects in North America that have conducted phased upgrades.

Marek Ratajczak, Project Manager, Project Delivery, provided members with an overview of the project components highlighting key components of treatment plant upgrades, ground improvements, and resource recovery opportunities.

9:21 a.m. Director De Genova arrived to the meeting.

Ken Abraham, External Manager, HDR, spoke to members regarding a review of challenges conducted by independent subject matter experts, highlighting cost saving opportunities through small footprint technologies, future proofing, and resource recovery opportunities.

Facilitated Discussion

Discussion ensued regarding the possibility of additional funding for new piloting, the cost savings for future proofing, using smaller footprint technologies in other treatment facilities, and the ability for the plant to address future growth.

SECTION 3 - Ecological Restoration Projects

Scott Wolf, External Partner, Miller Hull, spoke to members about the ecological restoration and park integration project, highlighting the design collaboration with the Musqueam First Nation, along with the sustainable strategies being incorporated to increase awareness and stewardship.

Lea Elliott, Senior Policy Analyst, Project Delivery, provided an overview of the 6 ecological restoration projects being undertaken to restore biodiversity on Iona Island.

Pippa Brashear, External Planning Principal, SCAPE, spoke to members regarding the challenge review of the park design highlighting the importance of ecological projects are fundamental to the large project goals, concluding that the ecological design and community planning for this project is exemplary.

Facilitated Discussion

Members discussed the need to mitigate construction disruption to the environment and the single road access safety concerns.

SECTION 4 - Project Schedule and Cost Estimates

Cheryl Nelms, General Manager, Project Delivery, spoke to members about the comprehensive project schedule and cost estimates as the upgrades are set to occur while operating the existing plant and park.

Brett Young, Director Major Projects, Project Delivery, provided members with an overview of the scheduling of the project highlighting the updated delivery schedule, opportunities, and risks.

Shannon Katt, External Director, PMA Consultants, spoke to members regarding the challenge review of the project schedule noting that the project schedule is well developed.

Rick Bitcon, External Associate VP, AECOM, provided members with a summary of the budget highlighting capital cost estimates, key cost drivers, cost risks, and opportunities to reduce costs.

Beverly Stinson, External Executive VP, AECOM, spoke to members regarding cost estimate validation and benchmarking analysis to other relevant projects.

Facilitated Discussion

Discussion ensued regarding appropriate funding actions between government bodies and other institutions.

SECTION 5 - Accountability and Governance

Don Fairbairn, External President, DCF Consulting, spoke to members about the challenges of funding major projects and the need to ensure effective project governance and leadership.

Dean Rear, Chief Financial Officer, spoke to members regarding the Phase 1 funding strategy and current approaches.

Cheryl Nelms, General Manager, Project Delivery, provided members with an overview on the elements required for a project to be successful.

Facilitated Discussion

Members discussed the need to ensure the project costs do not increase exorbitantly by ensuring good governance and multifaceted funding options.

Jerry Dobrovolny, Chief Administrative Officer/Commissioner, provided closing remarks addressing the next steps.

Presentation material titled "Iona Island Wastewater Treatment Plant Projects Conceptual Design" is retained with the February 3, 2022 Special GVS&DD Board agenda.

It was MOVED and SECONDED

That the GVS&DD Board receive for information the presentation titled "Iona Island Wastewater Treatment Plant Projects Conceptual Design."

CARRIED

C. RESOLUTION TO CLOSE MEETING

No items presented.

D. RISE AND REPORT (Items Released from Closed Meeting)

No items presented.

E. **ADJOURNMENT OR CONCLUSION**

It was MOVED and SECONDED

That the GVS&DD Board conclude its special meeting of February 3, 2022.

CARRIED

(Time: 12:02 p.m.)

CERTIFIED CORRECT

Katie Karn, Deputy Corporate Officer

Sav Dhaliwal, Chair

#50664564 FINAL

To: GVS&DD Board of Directors

From: Marie-Liesse Marc, Director, Major Projects, Project Delivery

Date: February 18, 2022 Meeting Date: February 25, 2022

Subject: **Northwest Langley Wastewater Treatment Plan Expansion Program – Ground Improvements & Reload Project Update**

LIQUID WASTE COMMITTEE RECOMMENDATION

That the GVS&DD Board receive for information the report dated February 18, 2022, titled “Northwest Langley Wastewater Treatment Plant Expansion Program – Ground Improvements & Preload Project Update”.

At its February 9, 2022 meeting, the Liquid Waste Committee considered the attached report titled “Northwest Langley Wastewater Treatment Plan Expansion Program – Ground Improvements & Reload Project Update”, dated February 1, 2022. The Committee passed the recommendation in the staff report as presented above.

Since the Committee meeting, staff identified a correction to be made to the report, on page 2, under *Ground Improvements & Preload Project*. The size of the four phases of ground improvement site was referenced as 43.6 hectares and the actual size of the site is 8 hectares. The attached report has been corrected to reflect actual site size.

This matter is now before the Board for its consideration.

Attachment

“Northwest Langley Wastewater Treatment Plan Expansion Program – Ground Improvements & Reload Project Update”, dated February 1, 2022 (*corrected February 18, 2022*)

50729977

To: Liquid Waste Committee

From: Marie-Liesse Marc, Director, Major Projects, Project Delivery

Date: February 1, 2022 Meeting Date: February 9, 2022

Subject: **Northwest Langley Wastewater Treatment Plant Expansion Program – Ground Improvements & Preload Project Update**

RECOMMENDATION

That the GVS&DD Board receive for information the report dated February 1, 2022, titled “Northwest Langley Wastewater Treatment Plant Expansion Program – Ground Improvements & Preload Project Update”.

EXECUTIVE SUMMARY

The expansion of the Northwest Langley Wastewater Treatment Plant, designed to provide additional network capacity for 200,000 residents and reduce sanitary sewer overflows events, requires significant ground improvements work to provide climate change and post-disaster resiliency. The ground improvements work completed to date has uncovered a large newly registered archeological site, with the recovery of over 2,000 artifacts thus far.

Appropriate inspection, investigation, and recovery of new archeological findings on the full construction site are expected to take an additional two years, impacting the planned completion of the expanded plant. This time will allow Metro Vancouver to conduct an accelerated business case as to whether the size of the plant should be increased to account for the accelerated growth observed in North Surrey.

PURPOSE

The purpose of this report is to provide information to the Liquid Waste Committee about the progress of the Ground Improvements & Preload Project (the GI&P Project).

BACKGROUND

As part of the new servicing plan for the Fraser Sewerage Area, the existing Northwest Langley Wastewater Treatment Plant, which currently serves 30,000 people in the Township of Langley, is in the process of being expanded to serve 230,000 people, including residents and businesses in the City of Maple Ridge and City of Pitt Meadows. Currently, liquid waste from these two municipalities is pumped 25km to Annacis Island Wastewater Treatment Plant in the City of Delta for treatment. The Northwest Langley Wastewater Treatment Plant Expansion Program includes ground improvements at the expanded plant site (the GI&P Project), construction of a new pump station and storage tank, a river crossing, and a new outfall into the Fraser River. Three of the five projects are currently in construction.

GROUND IMPROVEMENTS & PRELOAD PROJECT

The Northwest Langley site is considered a vulnerable seismic area with poor soil that will liquefy in the event of a significant earthquake, with significant settlement and lateral spreading, into the Fraser River. All new structures to be constructed as part of the treatment program require ground improvements in order to meet seismic performance criteria (1:2,475-year) and operate post-disaster. The site, located immediately adjacent to the Fraser River, is also vulnerable to river flooding, requiring the site to be raised 7.6 meters above existing ground surface levels, satisfying municipal requirements and providing climate change resiliency.

Ground improvements and preload works consist of the removal of subgrade, construction of stone columns using vibro-densification, importing of fill to raise the site, and the provision of additional sand for preloading of the site. Given the size of the site (8 hectares), the construction of the ground improvements works was broken into four phases and contract packages to manage contract size and implementation (see Attachment 1 – Ground Improvements & Preload Project Site Map). Construction started in October 2018 and is approximately 40% complete.

ARCHAEOLOGICAL FINDINGS

The wastewater treatment site is located within the asserted traditional territories of eight First Nations and in close proximity to three Katzie First Nation reserves. As part of the Project Definition Report, Metro Vancouver undertook an archaeological overview assessment of the plant site and surrounding area, which concluded that the potential for encountering archaeological sites was low. Metro Vancouver proceeded with the first phase of the GI&P Project in October 2018 under a chance find protocol, as recommended for the project in accordance with the *Heritage Conservation Act* (HCA) of British Columbia. Katzie Development Limited Partnership (KDLP) was engaged as Metro Vancouver's qualified archaeologist to provide archaeological monitoring of the geotechnical explorations and ground improvements excavations.

No archaeological material was encountered in the first phase of the GI&P Project, completed in March 2020. However, archaeological materials have been encountered in the Phase 2 site and are anticipated in the Phase 3 and Phase 4 sites:

- Over 2,000 artifacts were recovered in the Phase 2 GI&P Project area since June 2020, resulting in the identification of archaeological site DhRq-0114, which comprises several disturbed and intact areas;
- A number of artifacts (20) have also been encountered in the early stages of investigation in the Phase 3 and 4 GI&P Project area since March 2021, which resulted in the identification of a wet site (a water-saturated archaeological site), whose boundaries are currently being assessed.

To date, the archaeological work has been focused on recovery of artifacts rather than analysis, which will be completed post investigation. The findings on Phase 2 are comprised of lithic artifacts (items such as flakes, points, blades, and other expedient tools; see Attachment 2 – Select Artifacts Recovered), while the limited number of artifacts recovered on Phase 3 and 4 sites indicate the presence of lithics and perishable artifacts (weaving/basketry). In addition, the presence of a defunct watercourse was identified in the Phase 2 site, which may also extend to the Phase 3 and Phase 4

sites. While it will not be possible to restore these relic drainages due to space constraints and the central location of these drainages, their presence is of particular interest to Metro Vancouver and Katzie First Nation as it provides information on how relic watercourses were used prior to European contact.

All recovered artifacts will be catalogued by KDLP and stored at the Katzie First Nation artifact storage facility (repository) in Katzie First Nation IR#1 across the river in Pitt Meadows, where analysis of the artifacts will take place. Metro Vancouver hopes to work with Katzie First Nation to give adequate recognition to these archeological findings.

SCHEDULE IMPACT

The Project Definition Report for the program, endorsed by the Board in October 2018, anticipated a completion of Phases 1&2 of the GI&P Project by the end of 2021, and Phases 3&4 by the end of Q1 2024. The construction of the liquid and solid streams of the expanded wastewater treatment plant were then scheduled to begin in Q4 2022 and Q2 2024 respectively.

Although the schedule for the remaining ground improvements work is highly dependent on future archeological findings in the area and HCA permits timelines, Phase 2 of the Ground Improvements and Preload work is currently expected to be completed by end of Q2 2024, with completion of Phase 3&4 work expected to be completed by Q2 2025. This is expected to in turn delay the completion of the expanded wastewater treatment plant from 2027 to 2029.

With the existing Northwest Langley Wastewater Treatment Plant already providing secondary treatment, the completion of the upgraded plant is not subject to regulatory deadline. However, the expanded Northwest Langley Wastewater Treatment Plant was anticipated to reduce the frequency and severity of the Sanitary Sewer Overflows both along the North Surrey Interceptor and within the Cities of Maple Ridge and Pitt Meadows. A delay in completion of the plant will in turn delay the planned reduction of those Sanitary Sewer Overflows events.

The delay presents an opportunity to review the design capacity of the expanded wastewater treatment plant, currently designed to provide service to a population of 230,000 residents. Increasing the plant capacity would provide the opportunity to accelerate the diversion of flows from a portion of North Surrey to the Northwest Langley Wastewater Treatment Plant, which is currently planned to occur during the Stage 2 expansion, not anticipated until post-2040 (see Attachment 3 – Northwest Langley Wastewater Treatment Plant – Catchment Areas). Growth planning within this area of North Surrey has accelerated in recent years, and diverting both the growth and the current flow from this area would reduce contributions that would otherwise flow to the North Surrey Interceptor, thereby reducing the risk of both Sanitary Sewer Overflows and structural failure.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The Ground Improvements & Preload Project delay will cause the wastewater treatment plant construction cost-to-complete estimate to further increase due to escalation. However, due to recent increases in the engineer's estimate for the plant, a design and cost estimate peer review is already in progress. These reviews will now incorporate an alternative option that accommodates the increased growth in North Surrey.

CONCLUSION

Appropriate inspection, investigation, and recovery of archeological findings on the Northwest Langley Treatment Plant site are expected to impact the program budget and delay the completion of the expanded wastewater treatment plant from 2027 to 2029. However, this time will allow Metro Vancouver to conduct an accelerated business case as to whether the size of the plant should be increased to account for accelerated growth in North Surrey.

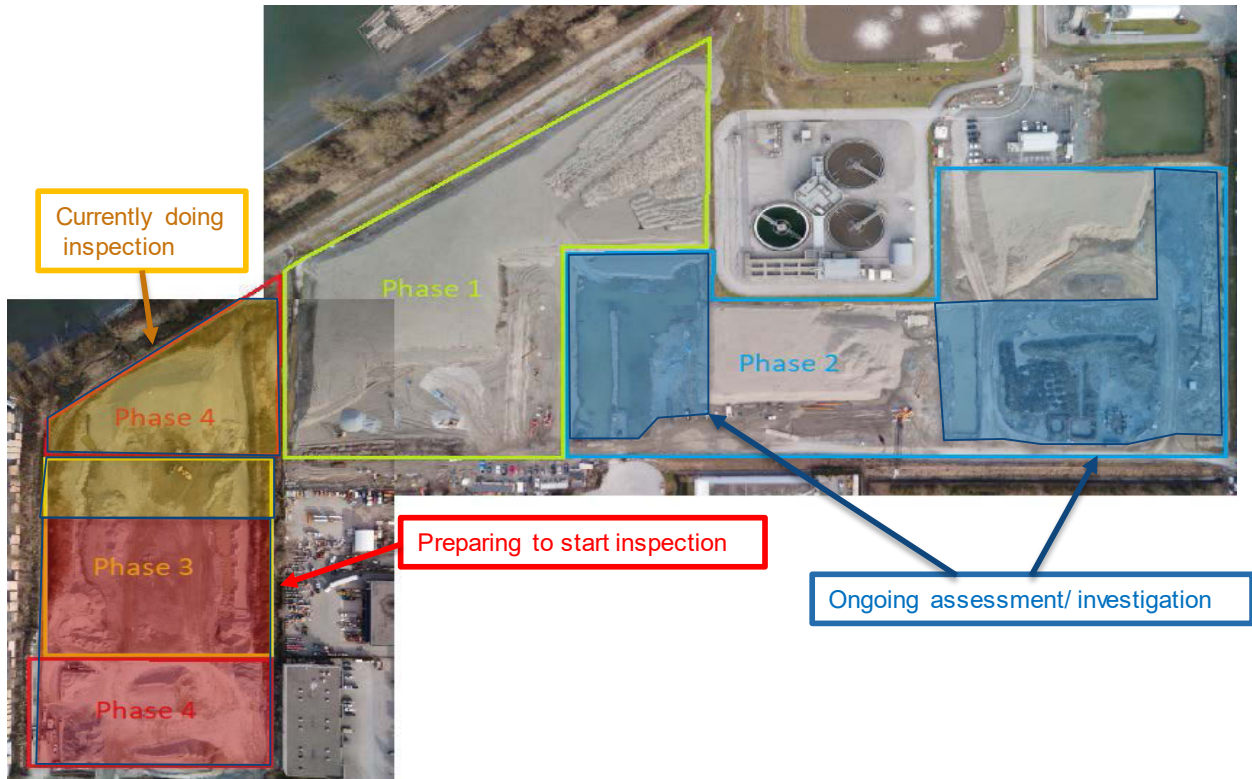
Staff will provide further updates to the Liquid Waste Committee in April 2022.

Attachments

1. Ground Improvements & Preload Project Site Map
2. Select Artifacts Recovered
3. Northwest Langley Wastewater Treatment Plant – Catchment Areas

50158867

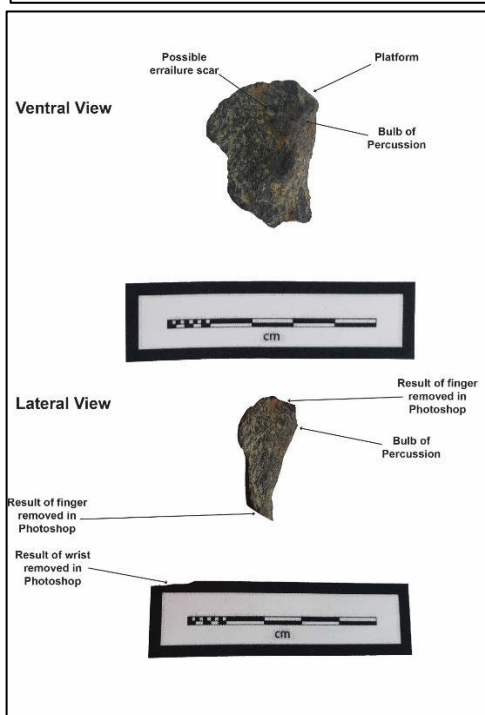
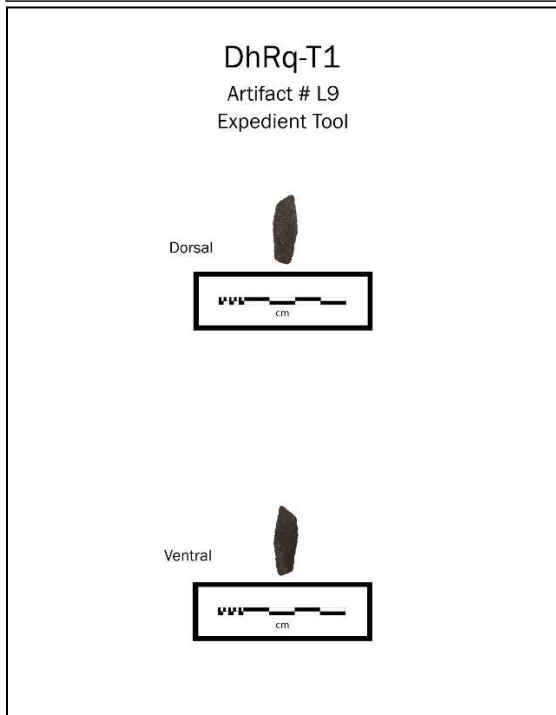
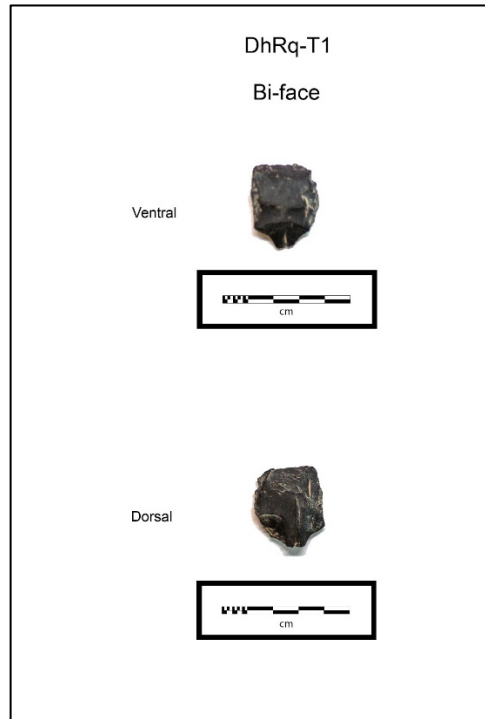
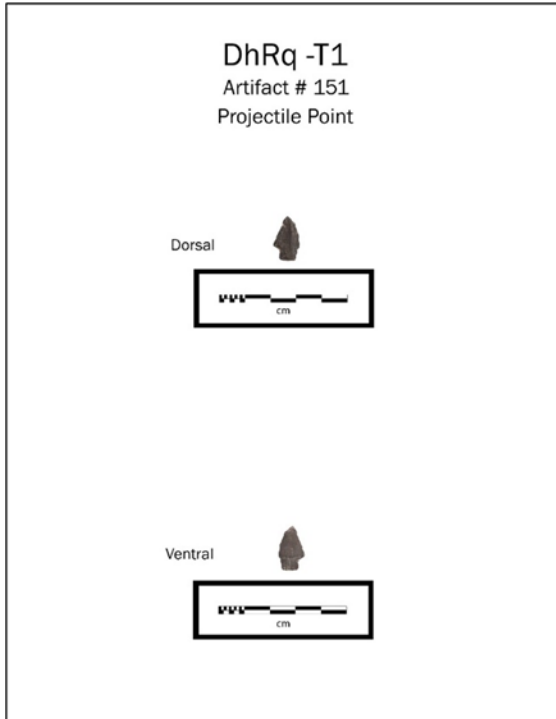
GROUND IMPROVEMENTS & PRELOAD PROJECT SITE MAP



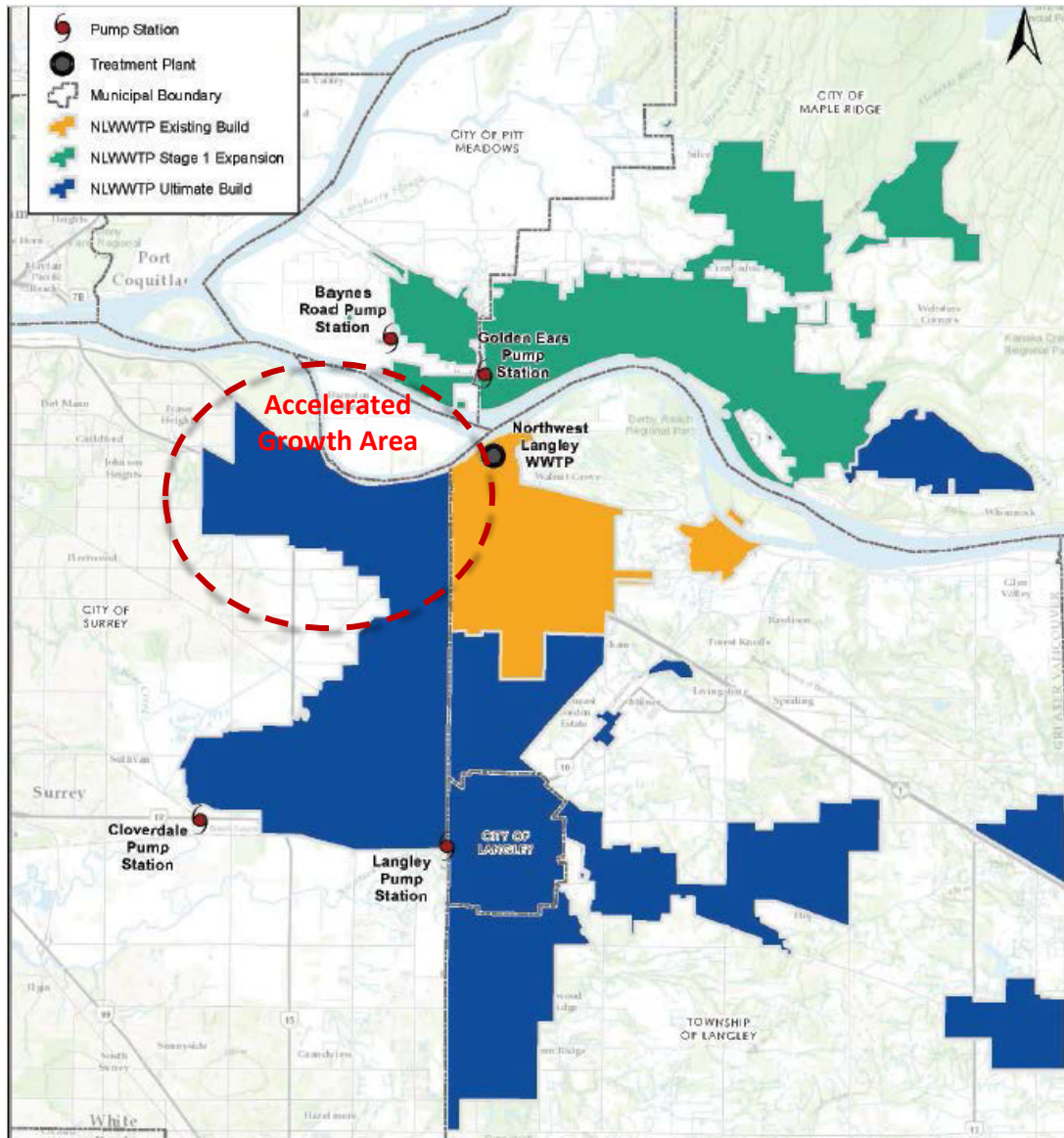
Attachment 2

SELECT ARTIFACTS RECOVERED

More than 2000 artifacts have been recovered to date. This includes a large collection of lithics (stone tools) such as coarse-grained volcanic flakes, quartzite flakes, chert flakes, blades, points, and other expedient tools. A sample is provided below.



NORTHWEST LANGLEY WASTEWATER TREATMENT PLANT – CATCHMENT AREAS



To: Liquid Waste Committee

From: Roy Moulder, Director, Procurement, Procurement and Real Estate Services
Colin Meldrum, Director, Engineering, Design and Construction, Liquid Waste Services

Date: January 25, 2022 Meeting Date: February 9, 2022

Subject: **Award of Phase C2 Engineering Construction Services RFP No. 14-163 for the Installation of Burnaby Lake North Interceptor No.2 – Winston St Ph. 2 - Trenchless Section**

RECOMMENDATION

That the GVS&DD Board:

- a) approve award of Phase C2, Engineering Construction Services, for an amount of up to \$4,227,265 (exclusive of taxes) to the Phase A, B and C1 consultant, AECOM Canada Ltd, for the Installation of Burnaby Lake North Interceptor No.2 – Winston St Ph.2 – Trenchless Section, subject to final review by the Commissioner; and
 - b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.
-

EXECUTIVE SUMMARY

In 2014, GVS&DD issued Request for Proposal (RFP) No. 14-163: Consulting Engineering Services for Design and Construction of the Burnaby Lake Interceptor No. 2. Contracts for the preliminary design, detailed design (Phases A and B) and Phase C1 – Open Cut - Engineering Construction Services were awarded to AECOM Canada Limited (AECOM). It is recommended that the GVS&DD Board authorize the award of the next phase, C2 – Winston Street – Trenchless Section, to AECOM in an amount of up to \$4,227,265 and authorize the Commissioner and Corporate Officer to execute the required documentation. The total value of this contract, after this award, will be \$9,684,949.

Since the initial award or preliminary engineering, the project scope and methodology has undergone several significant changes. These include extending the termination point of the sewer by 700m, expanding the trenchless installation portion from 750m to 3000m, adding environmental services to the scope, and extending the anticipated construction duration from 24 to 41 months.

PURPOSE

This report is to request authorization by the GVS&DD Board to award Phase C2, Engineering Construction Services, in an amount of up to \$4,227,265 (exclusive of taxes) to the Phases A, B and C1 consultant, AECOM Canada Ltd. (AECOM) for the Installation of Burnaby Lake North Interceptor No. 2 – Winston St Ph. 2 - Trenchless Section.

BACKGROUND

Pursuant to the *GVS&DD Officers and Delegation Bylaw No. 284, 2014 (Bylaw)* and the *Procurement and Real Property Contracting Authority Policy (Policy)*, procurement contracts which exceed a value of \$5 million require the approval of the GVS&DD Board of Directors. For multi-phased consultancy

contracts, the Policy provides that the value of the contract is the anticipated total value of the services to be provided over all phases, exclusive of taxes.

This report is being brought forward to the Liquid Waste Committee to consider a recommendation to the GVS&DD Board to authorize the award Phase C2, Engineering Construction Services, for the Installation of Burnaby Lake North Interceptor No. 2 - Winston St Ph. 2 – Trenchless Section.

DESCRIPTION

The Engineering Consulting Services contract for the Winston Street Sections was awarded to AECOM in April of 2015. AECOM's contract was a phased award to provide geotechnical, environmental, archaeological and tunneling services for the Preliminary Design (Phase A), Detailed Design (Phase B) and Construction Services (Phases C1 and C2) of the project, with the Phase B and C1/C2 portions of the contract to be negotiated at later date.

Phase 2 of the project – the Winston Street Section – was split into two separate phases for construction, as shown on the Attachment, and are being constructed separately. Phase C1 of the AECOM contract corresponds to Phase 2 – Open Cut of the project, which was completed in December 2021. Phase C2 of the AECOM contract, corresponds to Phase 2 – Trenchless Section, which is scheduled to begin construction in February 2022. Preliminary Design (Phase A) for the project was completed in the Spring of 2018 and the Detailed Design (Phase B) for the Open Cut Section completed in the Fall of 2020. This award covers the construction services for the Phase 2 – Trenchless section only.

Construction Services were accounted for in the original RFP (No. 14-163) for consulting engineering services with the number of hours stipulated by Metro Vancouver. The hours provided in 2015 were an estimate and were used for proposal evaluation purposes. Since then, the project scope and methodology has undergone several significant changes as reflected in the following changes:

- Project duration – the original RFP was based on 24 months total for construction of Phase 1 and Phase 2. The current estimate for construction is 41 months (17 months for Phase C1 and 24 months for Phase C2).
- Full-Time Geotechnical Inspection - this was not included in the hours stipulated in the RFP.
- Part-Time Tunnel Inspector – due to the increased complexity and length of the Trenchless section, a part-time tunnel inspector is now required. This was not included in the hours stipulated in the RFP.
- Environmental Services – environmental services were not included in the requested scope for construction services.

ALTERNATIVES

1. That the GVS&DD Board:

- a) approve award of Phase C2, Engineering Construction Services, for an amount of up to \$4,227,265 (exclusive of taxes) to the Phase A, B and C1 consultant, AECOM Canada Ltd, for the Installation of Burnaby Lake North Interceptor No. 2 – Winston St Ph. 2 – Trenchless Section, subject to final review by the Commissioner; and

-
- b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.
2. That the GVS&DD Board terminate the contract with AECOM resulting from Request for Proposal 14-163: Consulting Engineering Services for Design and Construction of Burnaby Lake North Interceptor No. 2 – Winston St Ph. 2 – Trenchless Section and direct staff to report back to the GVS&DD Board with options for an alternate course of action.

FINANCIAL IMPLICATIONS

There are enough funds in the project budget to accommodate this phase of the award. If the GVS&DD Board approves Alternative 1, an amendment in the amount of up to \$4,227,265 (excluding taxes) will be added to the contract with AECOM. The current value of the contract is \$5,457,684. This contemplated award will increase the value to \$9,864,949 (all values excluding taxes).

The GVS&DD Board has the choice not to proceed with Alternative 1; however, staff will need further direction in relation to the project. Alternative 2 will result in delay in construction of the BLNI2 Winston Street Section and possibly delay claims by the BLNI2 Winston Street Section contractor as any alternate approach will require time to engage a new consultant to provide the necessary construction engineering services.

CONCLUSION

Request for Proposal No. 14-163 was issued for consulting engineering services for the Burnaby Lake North Interceptor No. 2 – Winston St and contemplated the work to be done in four phases (A, B, C1 and C2). AECOM Canada Ltd. was the successful proponent.

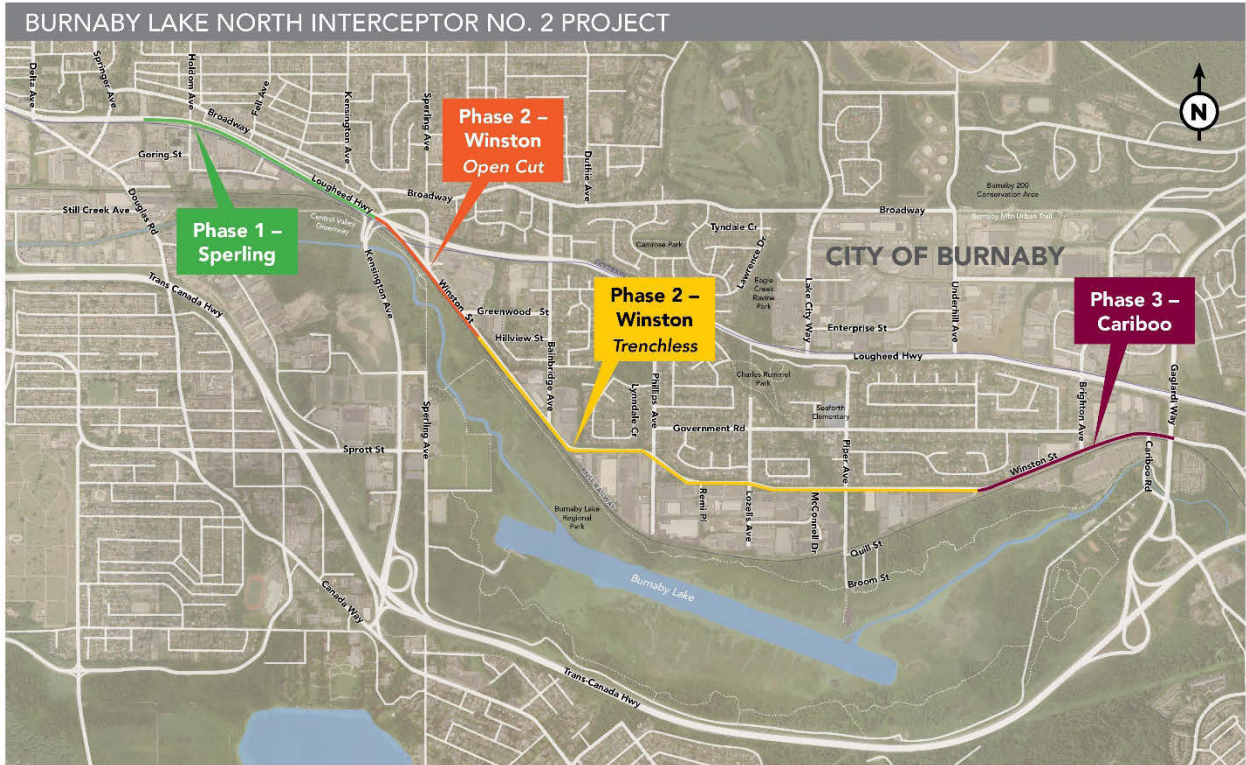
It is recommended that the GVS&DD Board authorize the award of Phase C2, Engineering Construction Services, for the Installation of Burnaby Lake North Interceptor No. 2 – Winston St Ph. 2 - Trenchless Section in the amount of up to \$4,227,265 (exclusive of taxes) to the Phase A, B and C1 consultant, AECOM Canada Ltd. and authorize the Commissioner and the Corporate Officer to execute the required documentation.

The Burnaby Lake North Interceptor No. 2 – Winston St section is critical infrastructure required to increase capacity of the system in the City of Burnaby.

Attachment

Burnaby Lake North Interceptor No. 2 Project

50349957



To: Liquid Waste Committee

From: Cheryl Nelms, General Manager, Project Delivery

Date: February 23, 2022 Meeting Date: February 23, 2022

Subject: **Award of Contract Resulting from RFQ No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project**

RECOMMENDATION

That the GVS&DD Board:

- a) approve the award of contract RFQ No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project to PCL Constructors Westcoast Inc, Contract 1 for Early Contractor Involvement and Construction Management Services estimated at \$40 million, subject to final review by the Commissioner; and
- b) authorize the Commissioner and Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

EXECUTIVE SUMMARY

Metro Vancouver has terminated its contract with Acciona Wastewater Solutions LP and is moving forward with a new contracting model to complete the North Shore Wastewater Treatment Plant Project. Under the new model, Metro Vancouver will work with a general contractor to finalize construction and a design consultant to finalize the design and provide quality assurance.

The delivery model for the general contractor is similar to an early contractor involvement contract, whereby the general contractor will provide constructability expertise during the completion of the design (Contract 1). If successful negotiation of a guaranteed maximum price or fixed price agreement can be made, then we will bring back to the Board for approval a recommendation for the contractor to assume the construction of the facility (Contract 2). This contract model is based on a cost-competitive strategy that allows for collaboration between contractor, designer, and Metro Vancouver while mitigating overall schedule delays.

The contract opportunity was a publically posted request for qualifications and was conditional on the termination of the existing contract. Metro Vancouver engaged professional advisors, a fairness monitor, and a due diligence reviewer in the evaluation process. It is recommended that Contract 1 for the general contractor role be awarded to PCL Constructors Westcoast Inc.

PURPOSE

This report is to advise the GVS&DD Board of the results of the Request for Qualifications (RFQ) No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project, and to recommend award of Contract 1 for Early Contractor Involvement and Construction Management Services estimated at \$40 million, for the general contractor to deliver the North Shore Wastewater Treatment Plant Project to PCL Constructors Westcoast Inc.

BACKGROUND

On January 17, 2022, the GVS&DD Board directed staff to issue a notice of termination of the contract between GVS&DD and Acciona Wastewater Solutions LP (“Project Co”). Following termination of the contract, Metro Vancouver proceeded with other activities to deliver the project as quickly as possible and in the best interest of the region, with an intent to minimize costs to the public.

The design and construction of the North Shore Wastewater Treatment Plant Project is partially complete. Completed construction includes ground improvement, approximately half of the superstructure structural concrete, and some in-street wastewater conveyance works.

Pursuant to the *GVS&DD Offers and Delegation Bylaw No. 284, 2014* (Bylaw) and the *Procurement and Real Property Contracting Authority Policy* (Policy), procurement contracts which exceed a value of \$5 million require the approval of the GVS&DD Board of Directors.

This report is being brought forward to the Liquid Waste Committee to consider the recommendation to the GVS&DD Board to authorize the award of general contractor services to PLC Constructors Westcoast Inc.

CHANGES TO CONTRACT MODEL

Under the previous contract, Acciona and their partners were responsible for the design, construction, commissioning, and process for performance for the plant.

To help to expedite the project while also retaining the ability for competitive pricing of services for the final delivery of the project, Metro Vancouver has adjusted the approach to retain a general contractor and a design consultant separately. The general contractor and design consultant will work collaboratively with Metro Vancouver to complete design, construction, and commissioning.

The delivery model for construction is an early contractor involvement contract, whereby the general contractor will provide constructability expertise during the completion of the design (Contract 1). Then, if successful negotiation of a guaranteed maximum price or fixed price agreement can be made, they may assume the construction of the facility (Contract 2).

In Contract 1, the general contractor will be responsible for reviewing the design and construction progress to date, developing a plan to deliver the project, doing some early works, and working with Metro Vancouver to define a revised project budget and schedule in order to enable the guaranteed maximum price or fixed price contract negotiation. If a negotiated agreement can be achieved, staff will report back to the Board for approval of Contract 2 for the completion of construction for the treatment plant.

To fill the role of the design consultant, Metro Vancouver staff are working collaboratively with AECOM senior leaders to develop an amendment to their current “Owners Engineering” agreement that will allow AECOM to assume “Engineer of Record” responsibilities and obligations for the North Shore Wastewater Treatment Plant, including both the constructed and future works. If an

agreement that is in the best interest of Metro Vancouver can be negotiated, the nature of that agreement will be reported to the Board.

Considerations for Competitive Pricing

Metro Vancouver has developed a contract approach to bringing in the general contractor that allows for completion of design and progress on construction in the shortest possible time frame while still planning for tenders or work packages that could be bid on to keep overall costs of delivery competitive. The approach allows for maximum agility and opportunities for competitive pricing, and is driven by schedule without sacrificing the need for competitive pricing.

Contract 1: Construction Management Services

In Contract 1, the general contractor will work with Metro Vancouver to establish project execution plans that will create more certainty on cost estimates. Work under this contract is anticipated to include:

- Contributing to design, procurement, and construction definition finalization;
- Detailed in-situ construction field assessment and analysis;
- Developing detailed project execution plan;
- Equipment and materials procurement;
- Equipment and materials take-off and pricing;
- Major work package tendering and pricing;
- Developing and maintaining cost estimates; and
- Developing a GMP or fixed price and firm schedule for completion of construction under Contract 2.

Other anticipated services under Contract 1 include initiation of construction of concrete works (approximately 40,000m³ remaining) and other early construction works and site services. Services performed under Contract 1 will be paid for on a cost-plus basis, with the exception of early construction works which may be on either a cost-plus or a fixed price basis.

Contract 2: Construction Delivery

Under Contract 2, the general contractor will be responsible for the completion of construction and commissioning of the project to the fixed price or guaranteed maximum price and schedule and in accordance with execution plans or other plans or agreements developed under Contract 1. If a negotiated agreement can be achieved, staff will report back to the Board for approval of Contract 2 for the completion of construction for the treatment plant.

For each package of work that needs to be constructed, it will either be self-performed (by the general contractor) or sub-contracted. For packages that go to tender, the general contractor will also have the option to participate in a procurement process alongside other interested contractors.

GENERAL CONTRACTOR RECOMMENDATION

Metro Vancouver began the process of procuring a general contractor to complete construction of the North Shore Wastewater Treatment Plant in the fall of 2021. On November 25, 2021 Metro Vancouver posted a public Request for Qualifications (RFQ) to seek a new contractor, conditional on

the termination of the existing contract. The RFQ was advertised on the Corporation and BC Bid websites. It closed on December 17, after three weeks in market.

Metro Vancouver's goal was to select a general contractor that:

- Has experience in taking over and completing projects of similar complexity and scope;
- Will commit highly qualified staff to the project;
- Will partner with the Corporation in design completion and discipline integration to maximize efficiency and ultimate value to taxpayers;
- Understands the value of economic opportunities for local contractors and suppliers; and
- Will safely build an asset of high quality to a firm price and schedule, once these two targets are determined, in compliance with applicable permits and regulatory conditions.

Evaluation Process

To support the rigor of the evaluation, Metro Vancouver engaged a fairness monitor, who observes the whole process as an independent observer of the fairness of the competitive process. Metro Vancouver has also engaged a due diligence reviewer, who reviews the evaluation process as to whether it is followed in accordance with the RFQ and is conducted consistently and without bias.

Metro Vancouver engaged professional advisors with extensive experience in major capital infrastructure projects to review the process of selecting a new contractor, and to participate in the review and assessment of all proposals submitted.

Metro Vancouver short-listed three respondents. The three short-listed respondents were:

- Aecon Water Infrastructure Inc.
- Graham Infrastructure LP
- PCL Constructors Westcoast Inc.

Considerations in evaluation included:

- Qualifications and experience of the firm
- Qualifications and experience of the staff put forward
- Pricing margins
- Information received through an interview and presentation about the respondents' qualifications, experience, and approach for completing construction of the plant

ALTERNATIVES

1. That the GVS&DD Board:
 - a. approve the award of contract RFQ No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project to PCL Constructors Westcoast Inc, Contract 1 for Early Contractor Involvement and Construction Management Services estimated at \$40 million, subject to final review by the Commissioner; and
 - b. authorize the Commissioner and Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

2. That the GVS&DD Board not approve the award for contract services for the completion of the North Shore Wastewater Treatment Plant, and direct staff to report back to the GVS&DD Board with options for an alternate course of action.

FINANCIAL IMPLICATIONS

If the GVS&DD Board approves Alternative 1, a contract will be awarded to PCL Constructors Westcoast Inc in a cost plus contract to complete Contract 1.

Currently, the North Shore Wastewater Treatment Plant program is budgeted for \$1.058B. This includes the cost of the treatment plant, the conveyance project, and preliminary design for decommissioning the Lions Gate plant. Metro Vancouver will work with the new general contractor to develop a plan to complete the project, including a revised project budget and schedule. Spend to date for the North Shore Wastewater Treatment Plant Program is \$498 million.

The budget for Contract 1 is estimated at \$40 million. The approved 2022 cash flow for the North Shore Wastewater Treatment Plant Program is \$267 million.

The GVS&DD Board has the choice to not proceed with Alternative 1. But staff will need further direction on how to proceed with the project. It will result in a delay to the project schedule and is anticipated to add additional costs to the overall project.

CONCLUSION

Metro Vancouver has implemented an approach finding alternative delivery partners for the North Shore Wastewater Treatment Plant that is designed to get the project delivered as quickly and efficiently as possible while considering cost competitiveness.

The contract model developed for the general contract positions Metro Vancouver to work in a highly collaborative way with the new general contractor to complete construction in the shortest possible time frame while still planning for tenders or work packages that could be bid on to keep overall costs of delivery competitive. The approach allows for maximum agility and opportunities for competitive pricing, and is driven by schedule without sacrificing the need for competitive pricing.

Within this contract, Metro Vancouver will work collaboratively with the new general contractor to develop a plan to complete the project, including a revised project budget and schedule. Work will be done within the approved 2022 budget for the North Shore Wastewater Treatment Plant. The budget for Contract 1 is estimated at \$40 million. Subsequent elements of the contract (Contract 2) will return to the Board for future approval. The approved 2022 cash flow for the North Shore Wastewater Treatment Plant Program is \$267 million.

Metro Vancouver evaluated the proposals with support from professional advisors and oversight from a fairness monitor and due diligence reviewer. It is recommended that the contract under Request for Proposal No. 21-457: North Shore Wastewater Treatment Plant (NSWWTP) Project, Contract 1 for Early Contractor Involvement and Construction Management Services, be awarded to PCL Constructors Westcoast Inc.

To: Climate Action Committee

From: Lillian Zaremba, Program Manager, Collaborative Innovations, Liquid Waste Services

Date: January 19, 2022 Meeting Date: February 11, 2022

Subject: **2022 Liquid Waste Sustainability Innovation Fund Application**

RECOMMENDATION

That the GVS&DD Board approve the allocation from the Liquid Waste Sustainability Innovation Fund of \$270,000 over two years starting in 2022 for Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project.

EXECUTIVE SUMMARY

The Climate Action Committee is responsible for overseeing the Sustainability Innovation Funds, and for making all funding recommendations to the respective Boards. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration. This report presents Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project recommended for funding, totaling \$270,000 over two years, which will be funded through the Liquid Waste Sustainability Innovation Fund.

PURPOSE

To present one project recommended for Sustainability Innovation Funding for the Climate Action Committee and the GVS&DD Board's consideration.

BACKGROUND

The Liquid Waste Sustainability Innovation Fund was created by the Board in 2004 to provide financial support to Liquid Waste Services projects that contribute to the region's sustainability. The GVS&DD Board adopted the *Liquid Waste Sustainability Innovation Fund Policy* in 2014, with further amendments in 2016 and 2021, to guide the use and management of the Fund. The Policy describes the process of generating, submitting, evaluating and recommending proposals for funding each year.

The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

LIQUID WASTE SUSTAINABILITY INNOVATION FUND POLICY

On an annual basis, Liquid Waste projects are submitted to an internal staff Steering Committee, representing a cross-section of the organization, to evaluate projects and initiatives based on the Fund's evaluation criteria. As defined in the policy, projects need to fulfill the following criteria:

- be overseen by the GVSⅅ
- be consistent with the authority and responsibility of the GVSⅅ
- be consistent with the objectives of the Board Strategic Plan or other Liquid Waste plans as applicable;

- consider partnerships including, but not limited to, member jurisdictions, academic institutions, non-governmental organizations, and community groups;
- result in a positive contribution, in the form of tangible results and/or measurable benefits, to the sustainability of the region;
- demonstrate innovation or a continuous improvement approach.

Annually the Climate Action Committee receives an update report on the projects supported by the Fund including the deliverables, outcomes, and the measurable benefits of these projects to the region’s sustainability. A summary of past projects can be found on the Sustainability Innovation Program website (Reference 1).

2022 APPLICATION PROCESS

An internal call for proposals closed on November 5, 2021 and two Liquid Waste proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, composed of representatives from several departments within Metro Vancouver.

The Steering Committee evaluated the submissions and determined that one proposal has strong alignment with promoting regional sustainability and innovation. The proposal recommended for funding by the Steering Committee is listed in the table below with additional detail provided in the executive summary (see Attachment).

Recommended Allocation from the Liquid Waste Sustainability Innovation Fund		
Project Title	Year	Amount Requested
Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation (Phase 1)	2022-2023	\$270,000
A biomimicry-inspired mechanism, Biorock uses naturally occurring ingredients in sea water to effectively construct marine structures under water. The process accumulates concrete-like material on a suitably designed frame and continues to grow and strengthen the structure over time. Biorock has been used to produce artificial reefs in other parts of the world.		

ALTERNATIVES

1. That the GVS&DD Board approve the allocation from the Liquid Waste Sustainability Innovation Fund of \$270,000 over two years starting in 2022 for Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project.
2. That the Climate Action Committee receive for information the report dated January 19, 2022, titled “2022 Liquid Waste Sustainability Innovation Fund Application” and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, \$270,000 for the project will be disbursed from the Liquid Waste Sustainability Innovation Fund over two years. The Fund has sufficient capacity to support Alternative 1.

Approved projects will be incorporated into applicable work plans and budgets.

CONCLUSION

The Liquid Waste Sustainability Innovation Fund was created by the Board in 2004 to provide financial support for Liquid Waste projects that contribute to the region's sustainability. The *Liquid Waste Sustainability Innovation Fund Policy* guides the use and management of the Fund and describes the process of generating, submitting, evaluating and recommending proposals for funding each year. The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the GVS&DD Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

This report presents the Steering Committee's recommendation to fund Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project over two years.

Additional details of this project are provided in the executive summary (see Attachment). Staff recommend that the Climate Action Committee approve the Steering Committee's recommendation for funding this proposal and forward the recommendation to the GVS&DD Board for consideration. Staff recommendation is presented as Alternative 1.

Attachment

Liquid Waste Sustainability Innovation Fund – Executive Summary (49482895)

Reference

<http://www.metrovancouver.org/services/air-quality/sustainability-innovation-program/Pages/default.aspx>

49331373

Sustainability Innovation Fund: Liquid Waste Services Executive Summary

Project Name: **Biorock: Innovative building material for shoreline protection, carbon sequestration & habitat creation – Phase 1**

Amount Requested from Sustainability Innovation Fund: \$270,000 for Phase 1 (2022-2023)

Purpose:

The purpose of this project is to explore the feasibility of Biorock, an artificial reef material that is grown in situ to provide resilient protection of coastal infrastructure, with the potential to capture carbon from local sea water. Shoreline infrastructure protection and resilience is a concern for critical components of the Metro Vancouver wastewater treatment system that are vulnerable to the effects of climate change, including rising sea level and storm surge.

Biorock is formed by applying low-voltage electric current to a submerged metal skeleton, which induces the deposition of solid calcium carbonate from dissolved carbon dioxide and calcium in sea water (Figure 1), similar to how seashells are formed. A Biorock artificial reef acts as a wave break to reduce forces on ocean-facing hard and soft infrastructure and can create marine habitat. Biorock sequesters carbon in the hard material that is formed, and may further sequester carbon by supporting marine vegetation growth. Expected advantages of Biorock over conventional rock or concrete shore protection include reduced carbon footprint, modularity, self-repairing capability, habitat creation, and reduced environmental impact during installation.

Project Objectives:

Phase 1 will take place over a two-year timeframe, with the following objectives:

- Support research to quantify the local carbon sequestration potential and ecological benefits of Biorock.
- Determine feasibility and develop a design for a Biorock demonstration structure adjacent to Iona Island, including consultation, risk assessment, permitting requirements and cost estimates.

If Phase 1 is successful, Phase 2 will involve fabrication, installation and commissioning of the Biorock demonstration off Iona Island. This SIF application is only for Phase 1. A separate SIF application will be submitted for Phase 2.

Contributions to Regional Sustainability:

Environmental benefits include increased resilience of existing infrastructure to the impacts of climate change, reduced environmental impact of new shore protection installations, and reduced carbon emissions. Biorock installations elsewhere have reduced erosion, created protected ecosystems for marine life, and increased biodiversity. Social/community benefits include development of expertise within the region on alternative coastal infrastructure and educational opportunities for graduate students supported by this project. The project will include opportunities for engagement with Indigenous

communities, neighbours, local environmental groups, and schools. Economic benefits of full-scale installation could include significant savings by extending the lifespan of coastal infrastructure or by providing a lower-cost alternative to traditional shore protection measures. Lifecycle cost comparisons will include the value of carbon set by the *Carbon Price Policy*.

Innovation Element:

This project aims to demonstrate Biorock as a viable alternative shore protection material in coastal BC waters and determine the range of applications within Metro Vancouver. Although Biorock is well established in other areas of the world, the project seeks to identify the regional scalability and economic considerations of this innovative approach to coastal infrastructure. The ecological benefits of Biorock could lead to innovations in local habitat restoration and applied research partnerships.

Tangible Benefits and Outcomes:

Tangible benefits and outcomes of the project are:

- Quantify carbon footprint of Biorock compared to conventional shore protection structures.
- Prepare design, installation, and operational requirements for a demonstration unit through review of ocean conditions including wave energy, tidal impacts and water quality.
- Produce a feasibility study and cost estimate for a demonstration Biorock installation adjacent to Iona Island, and enable an informed Phase 2 application.
- Develop project plan and identify gaps in expertise or partnerships necessary for permitting, construction, installation, and monitoring of a Biorock demonstration in Phase 2.

Members and Other Partners:

Liquid Waste Services staff will lead the project. The project will be advised by Dr. Thomas Goreau of Blue Regeneration. Dr. Goreau is a preeminent Biorock expert with over 30 years' experience directly with the technology inventor and has commissioned numerous installations. Dr. Goreau will provide site assessment, conceptual and preliminary design options, and insight into using this unique material. The project will be completed through a research partnership with Principal Investigator Dr. Kim Juniper of University of Victoria and professor Dr. Alfonso Mucci of McGill University. Dr. Juniper's team will review the formation of Biorock in coastal BC water conditions and quantification of carbon lifecycle. University of Victoria will leverage its allocated SIF funds to seek grants from agencies such as Natural Sciences and Engineering Research Council (NSERC), Mitacs, and others. The scope of work in Phase 1 includes opportunities for engagement with Musqueam, interested municipalities, community groups, and neighbours of Iona Island. Through this, cultural and ecological considerations can be integrated into the design process.

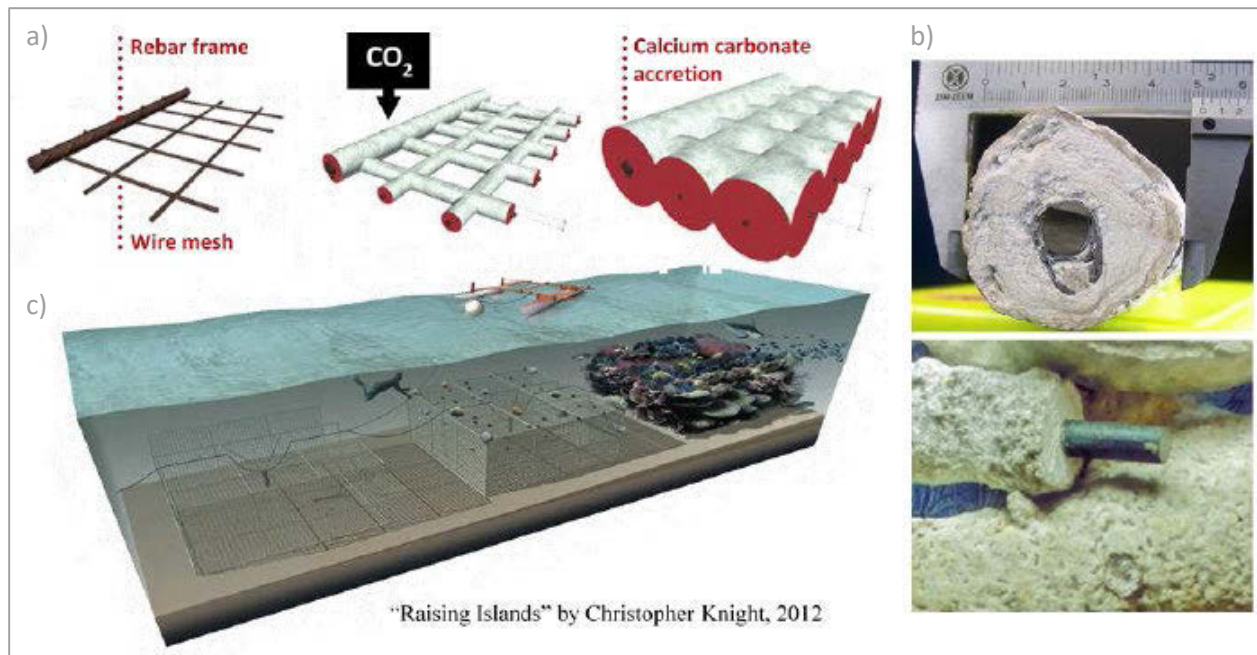


Figure 1. Biorock formation process: a) progression of accretion on the metal scaffold, b) thickness of Biorock on 10 mm rebar after 18 months, c) illustration of Biorock lifecycle in tropical regions for coral reef formation.

COMMITTEE INFORMATION ITEMS AND DELEGATION SUMMARIES

Greater Vancouver Sewerage and Drainage District
Board Meeting Date – Friday, February 25, 2022

This information item, listing recent information received by committee, is provided for the GVS&DD Board's information. Please access a complete PDF package [here](#).

Liquid Waste Committee – February 9, 2022

Delegation Summaries:

No delegations presented

Information Items:

5.2 2021 "Wipe It Green Bin It" Campaign Results

Zero Waste Committee – February 11, 2022

Delegation Summaries:

3.1 Sue Maxwell, Director, Zero Waste BC

Information Items:

5.1 Solid Waste Management Plan Update – Solid Waste and Recycling Industry Advisory Committee and Solid Waste Management Plan Public/Technical Advisory Committee

50530204