



To: Public Works and Transportation Committee **Date:** September 22, 2023
From: Milton Chan, P.Eng. **File:** 10-6060-01/2023-Vol
Director, Engineering 01
Re: Iona Island Wastewater Treatment Plant – Update September 2023

Staff Recommendation

That the proposed comments for the use of barges as the primary mode of transportation for construction materials and equipment for the Iona Island Wastewater Treatment Plant Upgrade project, as outlined in the staff report titled “Iona Island Wastewater Treatment Plant – Update September 2023,” dated September 22, 2023 from the Director, Engineering be endorsed for submission to Metro Vancouver.

Milton Chan, P.Eng.
Director, Engineering
(604)-276-4377

Att. 2

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Parks Services	<input checked="" type="checkbox"/>	
Sustainability and District Energy	<input checked="" type="checkbox"/>	
SENIOR STAFF REPORT REVIEW	INITIALS:	APPROVED BY CAO

Staff Report

Origin

The Iona Island Wastewater Treatment Plant is owned and operated by Metro Vancouver. It serves approximately 750,000 residents in the Vancouver Sewerage Area, including Vancouver, UBC Endowment Lands, and parts of Burnaby and Richmond. For Richmond, the Iona Plant only provides treatment for sewage originating from Mitchell Island and Richmond Island.

The Iona Island Wastewater Treatment Plant Upgrade involves the construction of a new facility to replace the existing primary treatment plant located on Iona Island. The upgrade is intended to comply with the updated Federal regulations of achieving a minimum of secondary level wastewater treatment by 2030. The new facility will provide a higher level of treatment and will be located in the same location as the existing wastewater treatment plant. The footprint of the new treatment plant will be larger than that of the existing.

At the November 20, 2019 Public Works and Transportation Committee Meeting, Metro Vancouver presented preliminary project design concepts. City comments on these design concepts were endorsed by Council at the January 27, 2020 Regular Council Meeting (Attachment 1) and submitted to Metro Vancouver. The response from Metro Vancouver has been largely positive, and staff will continue to communicate these comments to Metro Vancouver through the remainder of the design and construction process.

This report provides an update on the project, and outlines proposed comments on the potential use of barges during construction.

This report supports Council's Strategic Plan 2022-2026 Focus Area #2 Strategic and Sustainable Community Growth:

2.3 Ensure that both built and natural infrastructure supports sustainable development throughout the city.

This report supports Council's Strategic Plan 2022-2026 Focus Area #3 A Safe and Prepared Community:

3.4 Ensure civic infrastructure, assets and resources are effectively maintained and continue to meet the needs of the community as it grows.

This report supports Council's Strategic Plan 2022-2026 Focus Area #5 A Leader in Environmental Sustainability:

5.1 Continue to demonstrate leadership in proactive climate action and environmental sustainability.

Current Update

Project Status

In July 2020, following additional design work and stakeholder engagement, the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board endorsed a design concept that included tertiary treatment, resource recovery opportunities, ecological enhancement opportunities, community and park integration, and interpretive programs.

Subsequently, Metro Vancouver implemented a project definition process for stakeholder and public engagement, and conducted engineering assessments to refine the design concept. Through this process, the conceptual design was further developed and later approved at the GVS&DD Board Meeting on March 25, 2022.

The project is currently in the early works and preliminary design phase, with work to prepare the site underway.

The preliminary project schedule identifies completion of the upgrade to secondary treatment by 2035, five years beyond the regulatory deadline of 2030. The ecological enhancements and remaining construction are expected to be completed by 2038.

Project Funding

The total estimated cost of the project is \$9.9 billion (including cost escalation), based on the conceptual design that was approved by the GVS&DD Board in March 2022. In March 2023, the provincial government announced a \$250M funding contribution for the project. Metro Vancouver will continue exploring senior government funding opportunities as the project progresses.

Project Governance

During the GVS&DD Board Meeting on February 3, 2022, the GVS&DD Board discussed the need to develop a more robust project governance to limit the potential for significant cost increases. As such, Metro Vancouver has established dedicated project delivery, procurement and real estate departments to improve the management and delivery of critical projects. Metro Vancouver staff provided an update to the Metro Vancouver Regional District (MVRD) Board on their process improvements in an information report titled “Due Diligence Improvements for Major Projects” at the July 28, 2023 MVRD Board meeting.

The Iona Island Wastewater Treatment Plant Upgrade is proposed to be delivered in accordance with Metro Vancouver’s stage gate framework. The framework defines five stage gates that capture key milestones associated with the project initiation, definition, design, and construction phases. All project tasks within each phase of the project are required to be completed before the next stage gate can begin. Metro Vancouver staff have advised that this project delivery method will clearly define project objectives, roles and responsibilities, and promote risk management and efficient reporting to project stakeholders and decision makers.

Community Engagement

Metro Vancouver began community engagement for the project in 2018 to receive feedback on the conceptual design and associated ecological projects. The engagement included member jurisdictions, the public, key stakeholders and First Nations. Many of the concerns that were raised during the engagement were addressed through the project conceptual design phase, and Metro Vancouver has indicated that the remaining concerns will be addressed during the ongoing project early works and preliminary design phase.

Project updates and community engagement events are regularly updated on Metro Vancouver's webpage for the project.

Temporary Barge Facility

During the project definition stage, Metro Vancouver identified the potential use of barges to transport materials and equipment during construction of the project. Using barges will reduce construction traffic on Ferguson Road, thereby improving safety for cyclists, pedestrians, and vehicles. In addition, greenhouse gas emissions will be significantly reduced as Metro Vancouver anticipates that the barge facility will replace over 500 dump trucks per day. If barges are not used, City-owned roads would be subject to large volumes of heavy truck traffic, which could significantly accelerate the deterioration of the roadways.

To facilitate this mode of transportation, a temporary barge facility is proposed to be constructed near the northeast portion of the site (Attachment 2). In an information report included on the March 25, 2022 GVS&DD Board Agenda, Metro Vancouver staff indicated that Deering Island residents had expressed concerns about the proposed barge facility location.

On October 5, 2023, Metro Vancouver is hosting an information session that will provide an opportunity for residents in the region to share their feedback on potential impacts of the barge facility. The engagement event will include updates on mitigation measures that Metro Vancouver will undertake for impacted nearby communities.

Analysis

The use of barges is in alignment with the Council endorsed comments on this project relating to road safety and additional loading of roads. Staff propose that the comment below be forwarded to Metro Vancouver:

- That the City supports the use of barges to transport materials and equipment during construction to reduce traffic congestion, enhance safety for cyclists accessing Iona Beach Park, and reduce greenhouse gas emissions.

Financial Impact

None at this time.

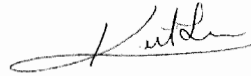
Conclusion

The Metro Vancouver Iona Island Wastewater Treatment Plant Upgrade Project will replace the existing primary treatment plant located in Richmond with a new facility that provides a higher level of treatment. The project conceptual design has been approved by the GVS&DD Board, and the total estimated cost of the project is \$9.9 billion. The project is currently in the early works and preliminary design phase, and construction is anticipated to be completed by 2038.

The use of barges during construction is consistent with the Council endorsed comments on this project, and staff recommend that the proposed comment be endorsed for submission to Metro Vancouver.



Manraj Gill, EIT
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Keith Lam, P.Eng., PMP
Project Manager
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Att.1: Iona WWTP Comments Endorsed January 27, 2020

Att.2: Iona Island Wastewater Treatment Plant Projects Summary



City of Richmond

Report to Committee

To: Public Works and Transportation Committee **Date:** December 11, 2019
From: Milton Chan, P.Eng.
Acting Director, Engineering **File:** 10-6060-04-01/2019-
Vol 01
Re: Iona Island Wastewater Treatment Plant Upgrade Project

Staff Recommendation

That the proposed comments on the Metro Vancouver Iona Island Wastewater Treatment Plant Upgrade project, as outlined in the staff report titled "Iona Island Wastewater Treatment Plant Upgrade Project," dated December 11, 2019 from the Acting Director, Engineering be endorsed for submission to Metro Vancouver.

Milton Chan, P.Eng.
Acting Director, Engineering
(604-276-4377)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Development Applications	<input checked="" type="checkbox"/>	
Transportation	<input checked="" type="checkbox"/>	
Sustainability	<input checked="" type="checkbox"/>	
Parks Services	<input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: CS	APPROVED BY CAO

Staff Report

Origin

At the November 20, 2019 Public Works and Transportation Committee, Metro Vancouver presented an update on the Iona Island Wastewater Treatment Plant (Iona Plant) Upgrade Project.

The treatment plant serves approximately 750,000 residents in the Vancouver Sewerage Area (VSA), which includes Vancouver, UBC Endowment Lands, and parts of Burnaby and Richmond. For Richmond, the Iona Plant only provides treatment for sewage originating from Mitchell Island and Richmond Island.

The Iona Plant Upgrade project involves construction of a new facility to replace the existing primary treatment plant located on Iona Island. This upgrade is required to comply with the updated Federal regulations of achieving a minimum of secondary level wastewater treatment by 2030. The new facility will provide a higher level of treatment and will be located on the site of the existing wastewater treatment plant on Iona Island, but with an expanded footprint.

The project is currently in the Project Definition phase and the Design and Construction phase is expected to begin in 2021. Project completion is anticipated by the end of 2030. Three preliminary concepts were provided to the Committee (Attachment 1). Metro Vancouver is currently presenting the three concepts to regional stakeholders and refining these into a preferred design. The preferred design may incorporate elements from any or all of the preliminary concepts and is scheduled to be presented to the Metro Vancouver Liquid Waste Committee in March, followed by another round of public engagement. Metro Vancouver is planning a public workshop in Richmond in early 2020; however, the date and location have not been finalized.

In December 2018, Council issued an Environmentally Sensitive Area (ESA) Development Permit (DP 18-820582) to Metro Vancouver to allow construction of temporary mechanical dewatering facilities on site in preparation for future upgrades to the treatment facility. A second associated ESA Development Permit (DP 19-850320) for a temporary concrete pad and gravel parking areas to further facilitate the dewatering activities has been endorsed by the Development Permit Panel and is anticipated to be brought forward to Council in early 2020.

In addition, at the November 20, 2019 Public Works and Transportation Committee, the Committee made the referral that “staff work with Metro Vancouver and YVR Airport Authority to improve the safety of the road out to Iona for cyclists and other users.” A joint meeting between the City, Metro Vancouver and Vancouver Airport Authority staff has been scheduled in January 2020 to initiate work on this matter.

This report supports the following strategies within Council's Strategic Plan 2018-2022:
Strategy #1, A Safe and Resilient City:

Enhance and protect the safety and well-being of Richmond.

1.2 Future-proof and maintain city infrastructure to keep the community safe.

Strategy #2, A Sustainable and Environmentally Conscious City:

Environmentally conscious decision-making that demonstrates leadership in implementing innovative, sustainable practices and supports the City's unique biodiversity and island ecology.

2.1 Continued leadership in addressing climate change and promoting circular economic principles

2.2 Policies and practices support Richmond's sustainability goals.

This report outlines proposed comments on the general treatment plant upgrade concept for Council consideration.

Analysis

Staff have reviewed the general concept of the project and have proposed comments, as outlined below:

1. That the City supports a tertiary level of treatment for the new wastewater treatment plant;
2. That Metro Vancouver seek opportunities to contribute to the provincial and federal efforts to revitalize Sturgeon Bank through the Steveston and Iona restoration projects that are currently under way;
3. That Metro Vancouver include discussions supporting fish and wildlife habitat enhancement in their stakeholder engagement events and further consider all wildlife receptors specific to the provincially protected Sturgeon Banks Wildlife Management Area;
4. That the effluent standards be reviewed to further reduce any environmental impacts;
5. That potential odour issues related to increased operation and expansion of the Iona Plant be investigated;
6. That public access to Iona Beach Park be maintained and enhanced, and pedestrian trails be implemented to make the beaches to the south and west of the Iona Plant more accessible;


7. That Metro Vancouver implement educational programming and interpretation amenities to promote the ecological values of the marsh and foreshore areas;
8. That Metro Vancouver work with the City and YVR to provide protected cycling facilities along Ferguson Road and Iona Island Causeway to improve safety of the road for cyclists accessing Iona Beach Park;
9. That the impacts of additional loading on the road be evaluated to ensure that ditch bank stability for both sides of the road is not compromised;
10. That Metro Vancouver consider climate change-induced sea level rise and flood risk management in the planning and implementation of this project, and explore options to raise the land elevation and/or implement flood protection infrastructure to ensure operational capability of the treatment plant over its service life;
11. That Metro Vancouver anticipate that future development associated with the Iona Plant project will continue to follow the City's Environmentally Sensitive Area Development Permit Process to secure appropriate compensation;
12. That discussions regarding the facility's waste recovery initiative, which will produce resources of value to the City, such as water for irrigation, be included as a part of the project's stakeholder engagement events; and
13. That Metro Vancouver explore opportunities to maximize energy recovery from the wastewater treatment process.

Financial Impact

None.

Conclusion

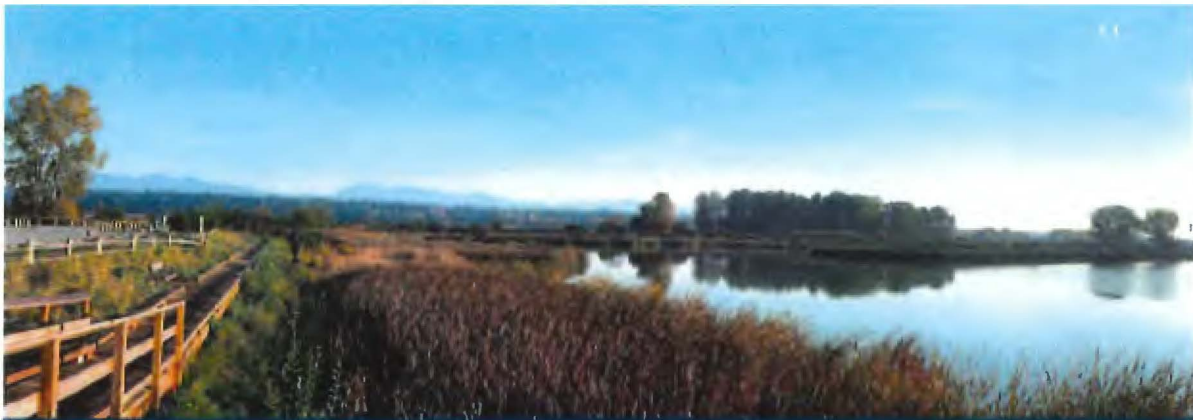
The Metro Vancouver Iona Island Wastewater Treatment Plant Upgrade Project will replace the existing primary treatment plant located in Richmond with a new facility that provides a higher level of treatment. The project is currently in the Project Definition phase and the construction is anticipated to be completed by the end of 2030. Staff have reviewed the information presented and have proposed comments regarding the project. The proposed comments aim to enhance the City's environmental quality and public safety, as well as encourage Metro Vancouver to explore waste and energy recovery initiatives. Staff recommend that the proposed comments outlined in this report be endorsed for submission to Metro Vancouver.


Jason Ho, P.Eng.
Manager, Engineering Planning
(604-244-1281)

JH:rd

Attachment 1: Metro Vancouver Iona Plant Project Definition Update Presentation

Metro Vancouver Iona Plant Project Definition Update Presentation



IONA ISLAND WASTEWATER TREATMENT PLANT

PROJECT DEFINITION UPDATE

Fred Nenninger

DIRECTOR, POLICY, PLANNING AND ANALYSIS
LIQUID WASTE SERVICES

VSA Councils Update

2019/01/11



PROJECT GOALS

Secondary
Wastewater
Treatment

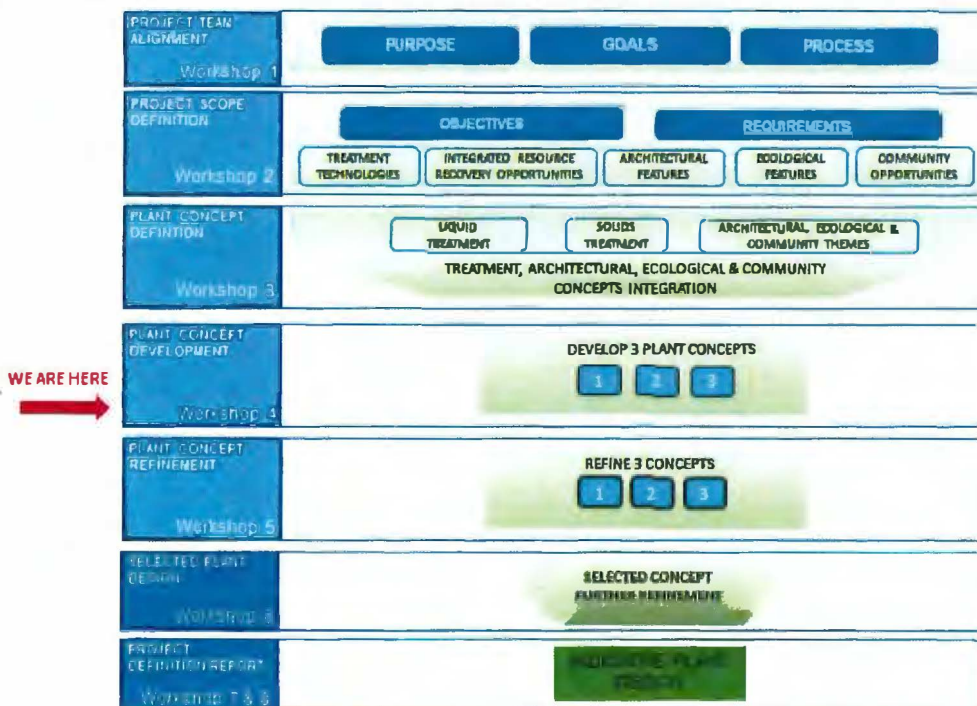
Community and
Park Integration

Resource Recovery












PROJECT DEFINITION PHASE

- Plan for plant to 2100
- Compare liquid treatment options
- Compare solids treatment options
- Develop an indicative design for 2030 build
- Integrate new plant with park
- Business case resource recovery opportunities

PROJECT DEFINITION PROCESS

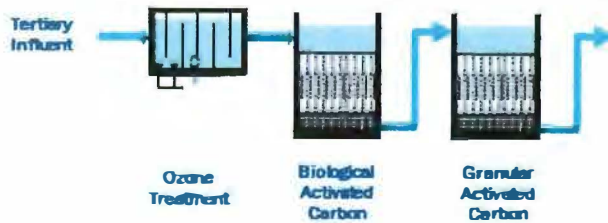


WASTEWATER TREATMENT MATRIX

	Plant Build Scenarios		
	Secondary Plant	Tertiary Plant (Filtration)	Tertiary Plant (MBR)
Primary Treatment Options	INCLINED PLATE CLARIFIERS 	BIOLOGICALLY ENHANCED CLARIFICATION 	INCLINED PLATE CLARIFIERS + CHEMICALS CHEMICAL → 
Secondary Treatment Options	ACTIVATED SLUDGE 	ACTIVATED SLUDGE 	MEMBRANE BIOREACTOR 
Tertiary Treatment Options		TERTIARY FILTRATION 	MEMBRANE BIOREACTOR 
Solids Treatment Options	ANAEROBIC DIGESTION  → BIOSOLIDS MANAGEMENT PROGRAM	THERMAL HYDROLYSIS + ANAEROBIC DIGESTION + BIOSOLIDS DRYING 	SLUDGE WASTE-TO-ENERGY 

ADVANCED TREATMENT PILOT PLANT

- Example process train for micropollutant removal



IONA ISLAND



SECONDARY PLANT



TERTIARY PLANT (FILTRATION)



TERTIARY PLANT (MBR)



RESOURCE RECOVERY OPPORTUNITIES

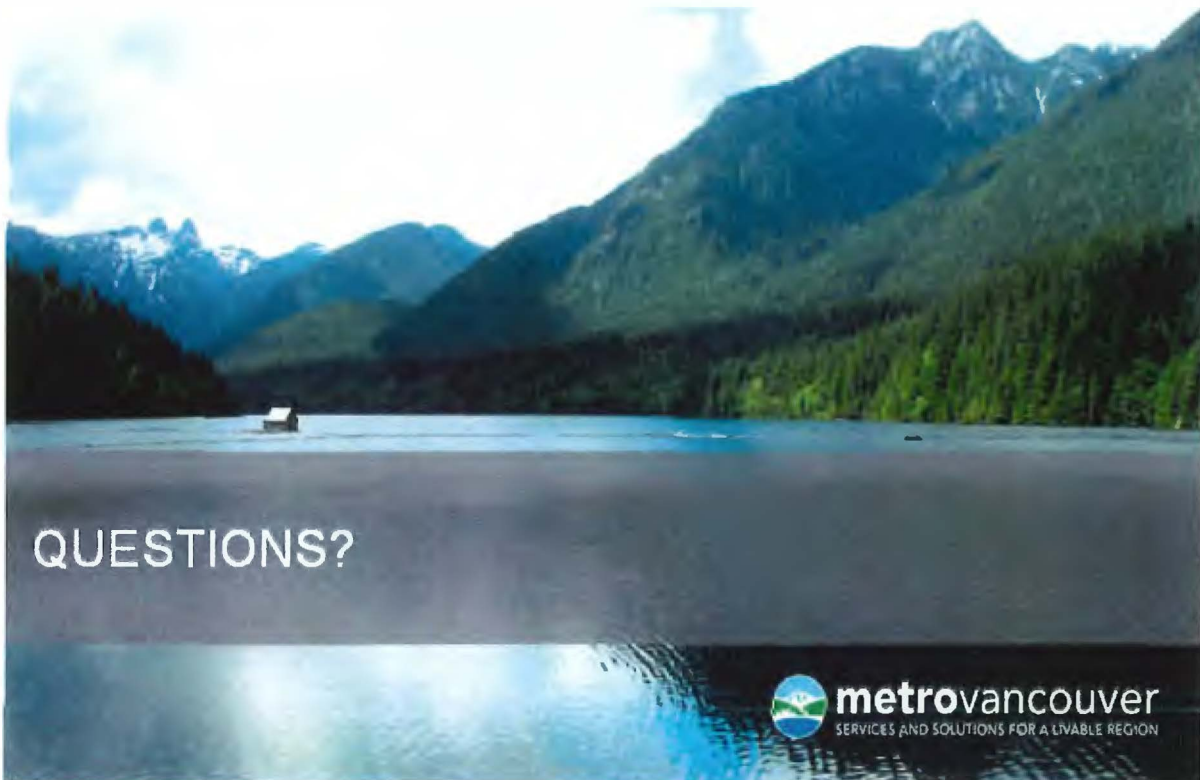


ENGAGEMENT ACTIVITIES (2019 / 2020)

Timeline	Activity
October 17 November 1	Present preliminary design concepts to Liquid Waste Committee and GVS&DD Board
November 2019 - February 2020	Present preliminary design concepts to: <ul style="list-style-type: none"> VSA municipal councils / committees Musqueam Chief and Council Regional Parks Committee Public Workshop #2 (Richmond) Community associations / environmental groups Musqueam Community Meeting #2
Ongoing	Monthly meetings with VSA municipal staff Meetings with Musqueam staff Stakeholder meetings



ENGAGEMENT ACTIVITIES (2020)

Timeline	Activity
March	Special Meeting of the Liquid Waste Committee to workshop design concepts and recommended design Present design concepts and recommended design to GVS&DD Board
April to September	Present recommended design to: <ul style="list-style-type: none">• VSA municipal councils / committees• Musqueam Chief and Council (TBC)• Regional Parks Committee• Public Workshop #3• Community associations / environmental groups• Musqueam Community Meeting #3 (TBC)
November	Project Definition Report and Indicative Design to Liquid Waste Committee and GVS&DD Board









Early and enabling works to be completed on Iona Island prior to construction of WWTP:

 Biosolids stockpile removal	 Geotechnical investigations
 Biosolids lagoon decommissioning	 Ecological baseline studies
 Archaeological investigations	 Utility relocates and temporary power construction
 Site remediation	 Topographical surveys and LIDAR scans

Resource Recovery Initiatives:

 Reclaimed Water	 Heat
 Biomethane	 Nutrients/Biosolids

IONA ISLAND WASTEWATER TREATMENT PLANT PROJECTS SUMMARY



