



Kingston Inner Harbour – Updated Conceptual Sediment Management Plan

Sediment Management Planning Update

February 2024

Introductions

PROJECT TEAM

Site Custodians

Transport Canada / Parks Canada

Technical Expert, Project Manager

Public Services and Procurement Canada

Sediment
Management Plan
and Engagement
Consultant

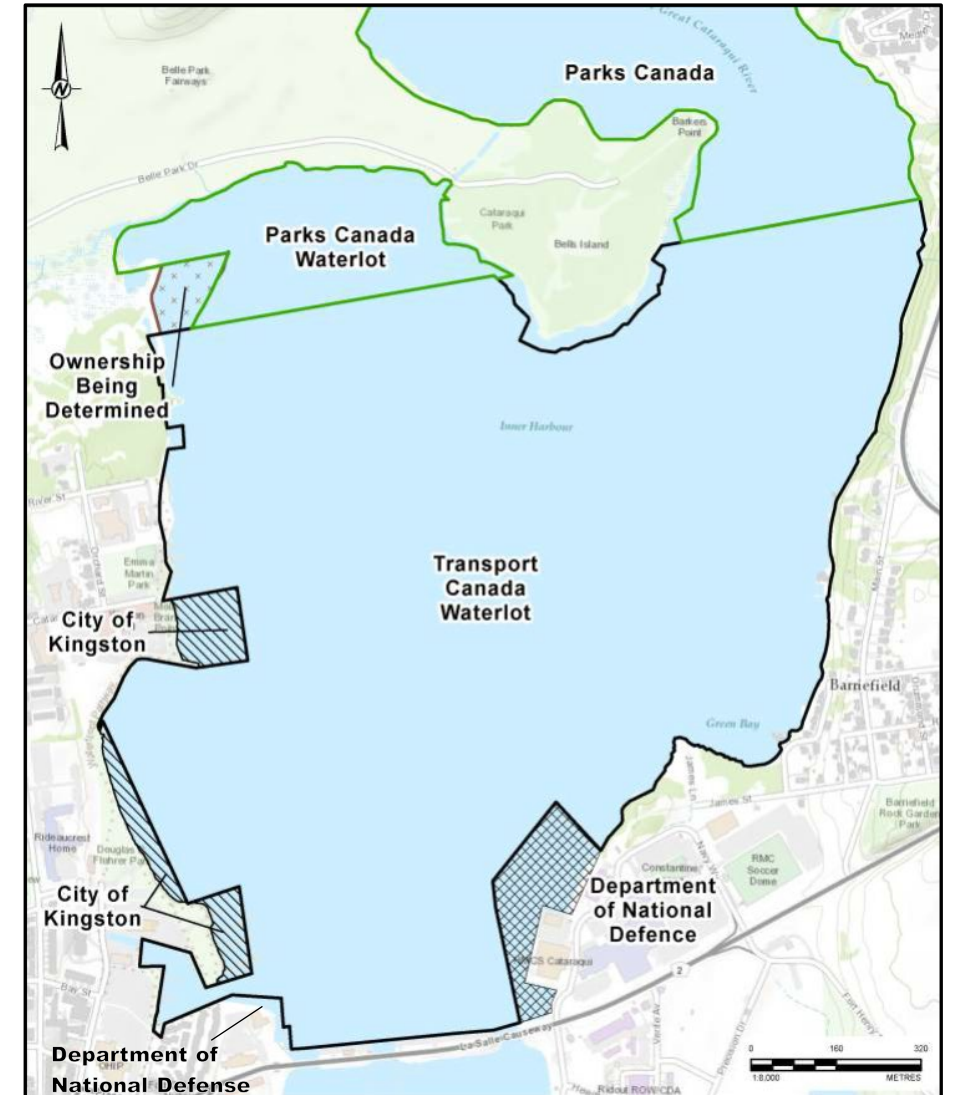
WSP

Ecological and
Archeological
Inventories

AtkinsRéalis

Impact Assessment
Consultant

Arcadis



Introductions

PURPOSE AND OBJECTIVES

- The purpose of this presentation is to share information regarding Transport Canada and Parks Canada's **updated** conceptual plans for managing contaminated sediment within Kingston Inner Harbour (KIH).
- The objective of this project is to reduce the potential risks from sediment contamination to people and wildlife within KIH through management of sediment quality, while still protecting sensitive species, habitats, and valued features.



Presentation Overview

Site Background

- History of Contamination
- Management Area and Jurisdiction

Studies and Results

- Evaluating Natural Recovery
- Sediment Chemistry (2011 to 2021) and Ecological Impairment

Recommended Management Strategy

- Original Sediment Management Plan (SMP) (2021)
- Engagement Feedback to Date
- Updated Conceptual SMP (2023)
- Source Control and Potential for Recontamination

Current Status

- Ongoing Site Studies
- Impact Assessment

Next Steps

- Project Schedule
- Ongoing Opportunities for Engagement

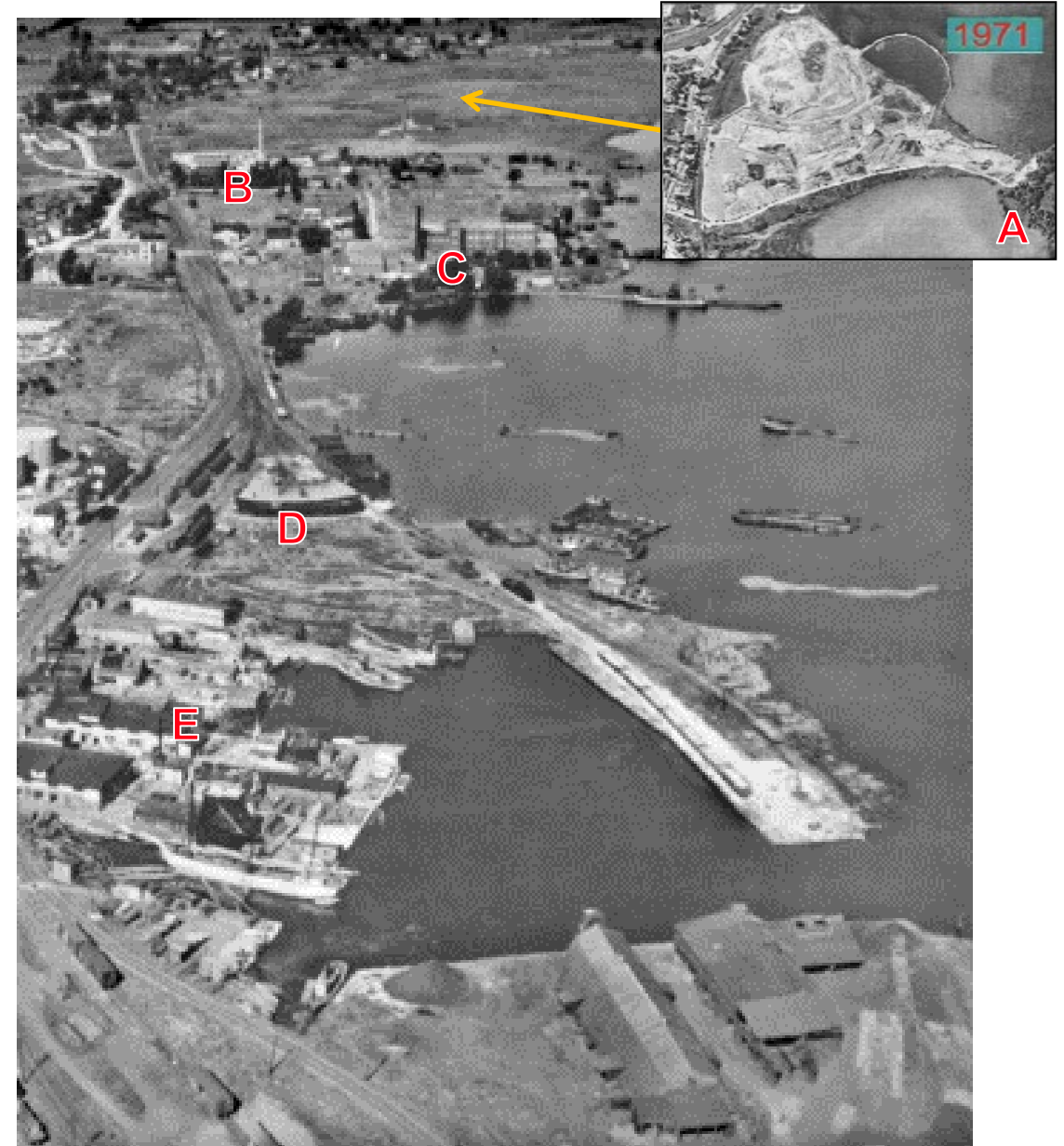
Site Background

HISTORY OF CONTAMINATION

Historical contaminating industries:

- Former Belle Park landfill (A)
- Tannery and smelting operations (B)
- Manufacturing / fabrication mills (C)
- Railyards (D)
- Shipyards (E)
- Upland coal gasification plant and fuel depots

The contaminants of concern are mostly metals such as chromium, arsenic, and mercury, as well as polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).

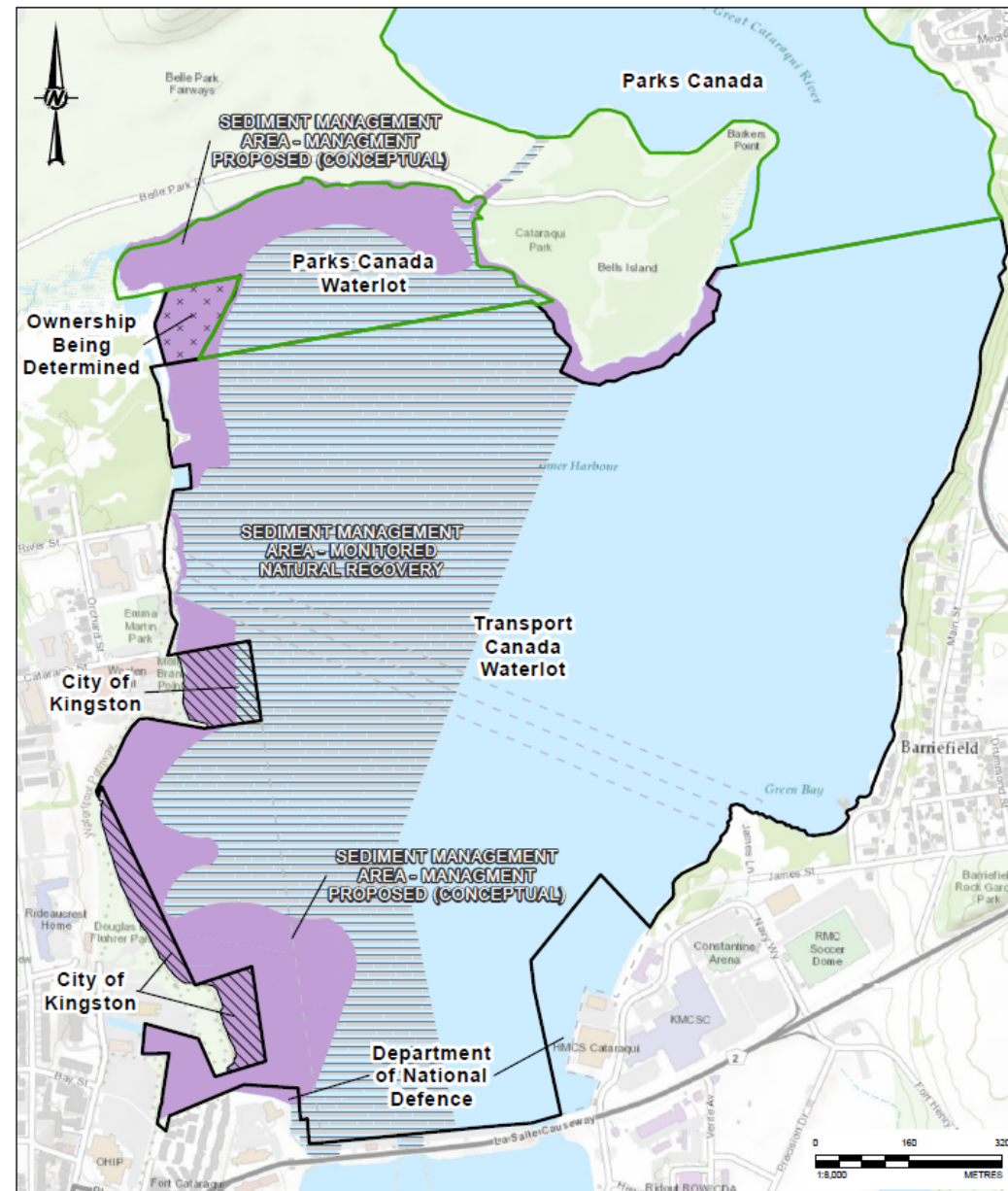
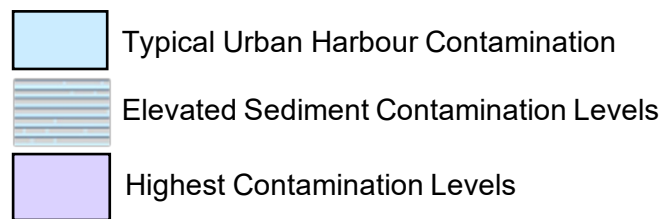


Site Background

MANAGEMENT AREA AND JURISDICTION

Management area includes approx. 1.7 km of Great Cataraqui River on the west side of KIH, bound by Hwy 2 (LaSalle Causeway) to the south and Belle Island to the north

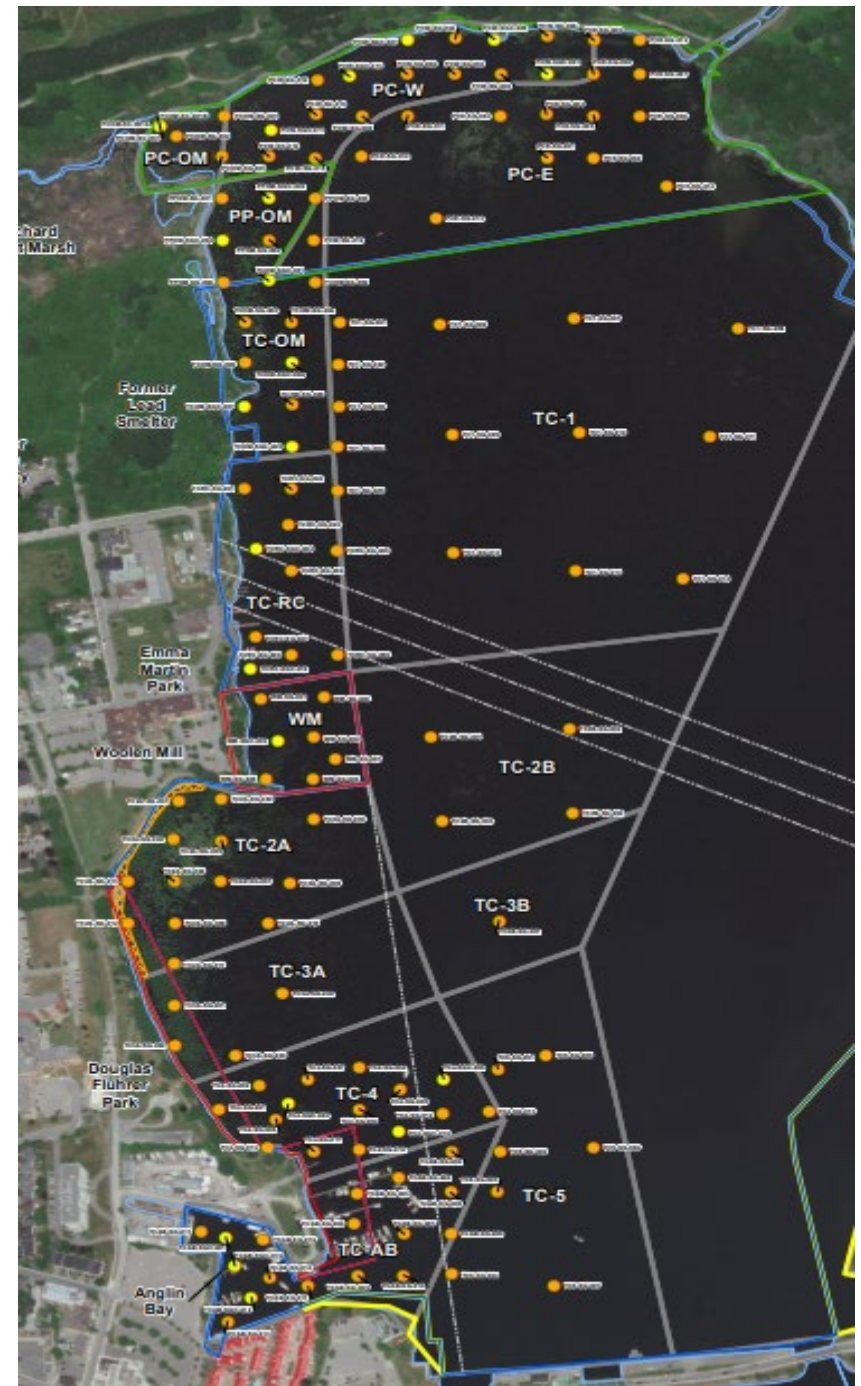
- Federal
 - Parks Canada
 - Transport Canada
 - Department of National Defence
- Municipal
 - City of Kingston



Environmental Studies and Results

EVALUATING NATURAL RECOVERY

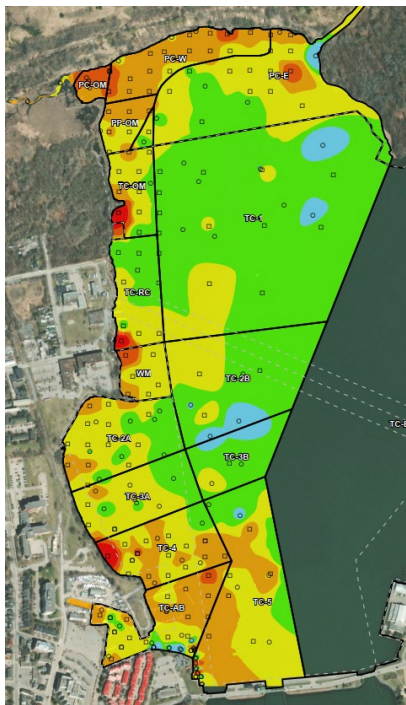
- A sediment sampling program (2021) was completed to update the areas of contamination and assess any changes in sediment chemistry over time.
- Overall, the results confirmed earlier patterns (2000-2013); no widespread evidence of significant natural recovery of sediment quality over the past decade.
- Concentrations of contaminants of concern remain above sediment quality guidelines, and at similar magnitude and spatial distribution to earlier characterizations.



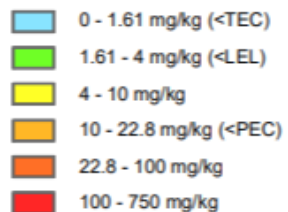
Environmental Studies and Results

SEDIMENT CHEMISTRY (2011-2021) AND ECOLOGICAL IMPAIRMENT

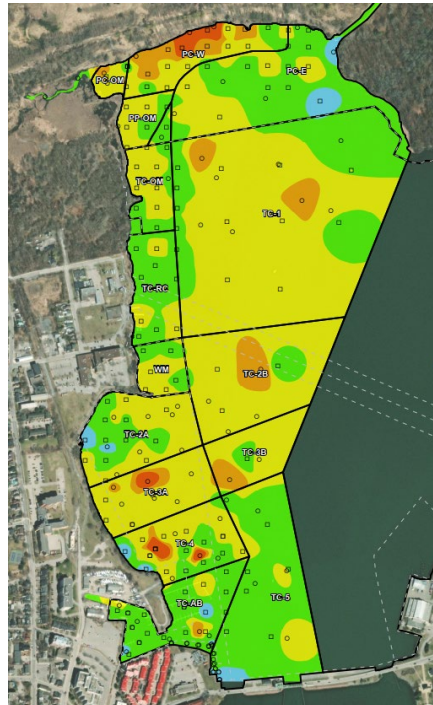
Polycyclic aromatic hydrocarbon (PAH)



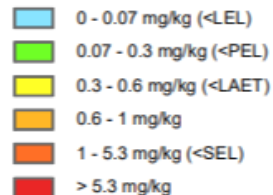
TOTAL PAH



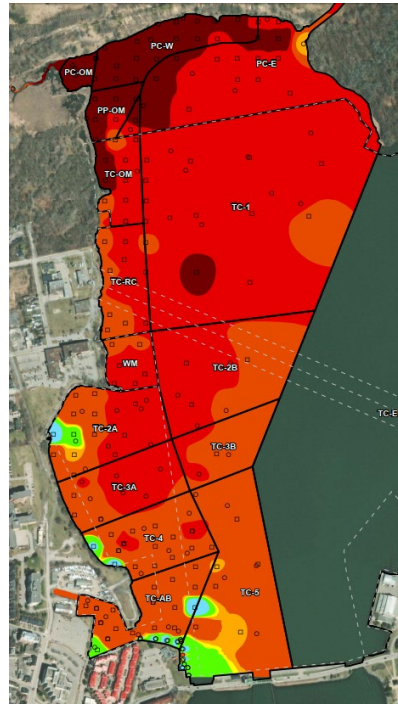
Polychlorinated biphenyl (PCB)



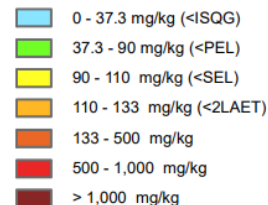
TOTAL PCB



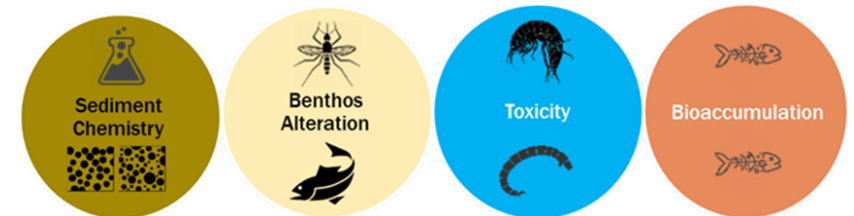
Chromium



CHROMIUM



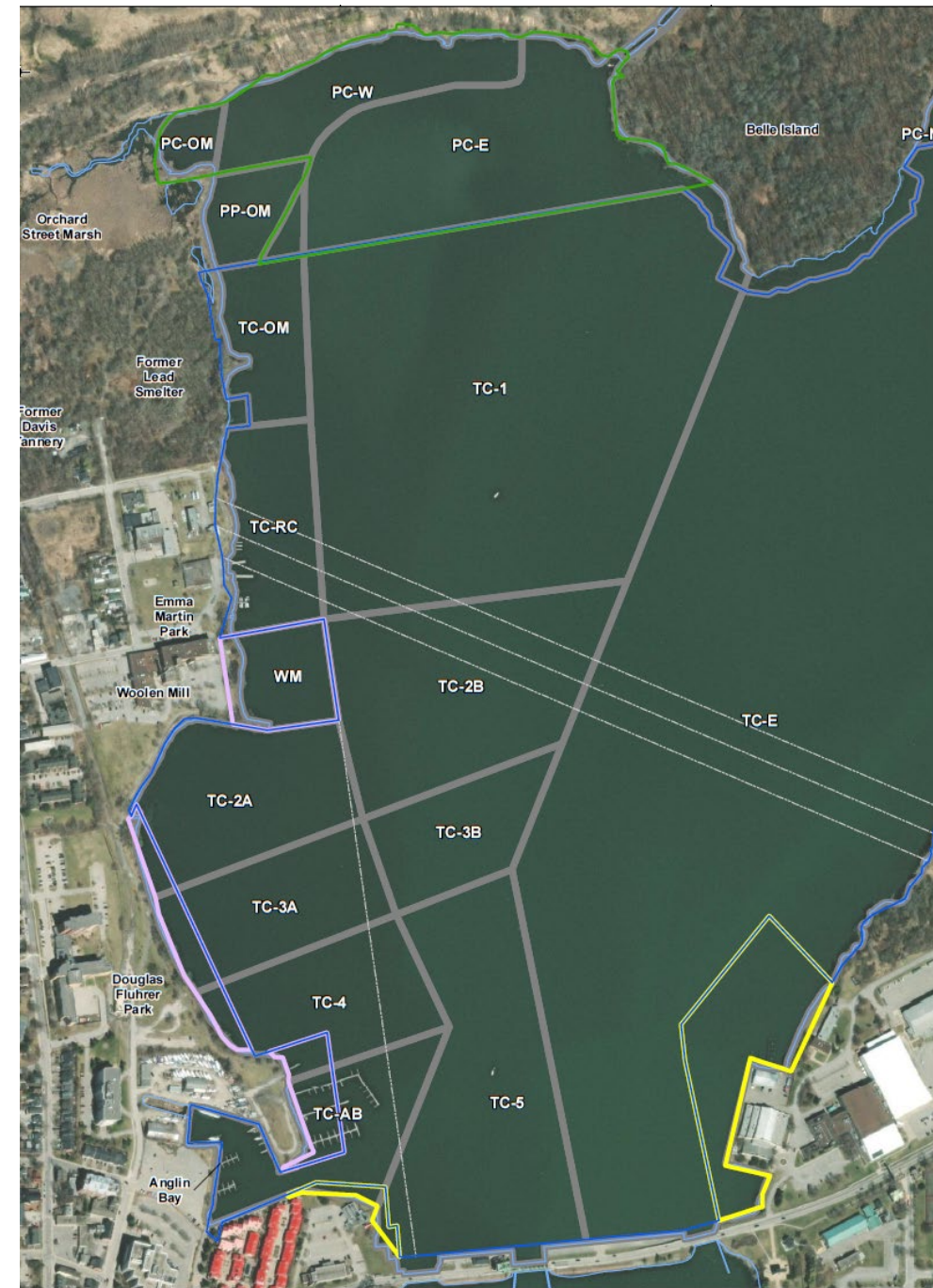
- **Eastern KIH** shows sediment quality similar to reference conditions north of Belle Island, with no consistent indications of ecological impairment
 - *no management action recommended*
- **Western KIH (see left)** shows sediment chemistry much higher than reference conditions, plus evidence of impairment, biological and toxicological effects, and other factors (bioaccumulation)
 - *need for management action*



Recommended Management Strategy

ORIGINAL SEDIMENT MANAGEMENT PLAN - 2021

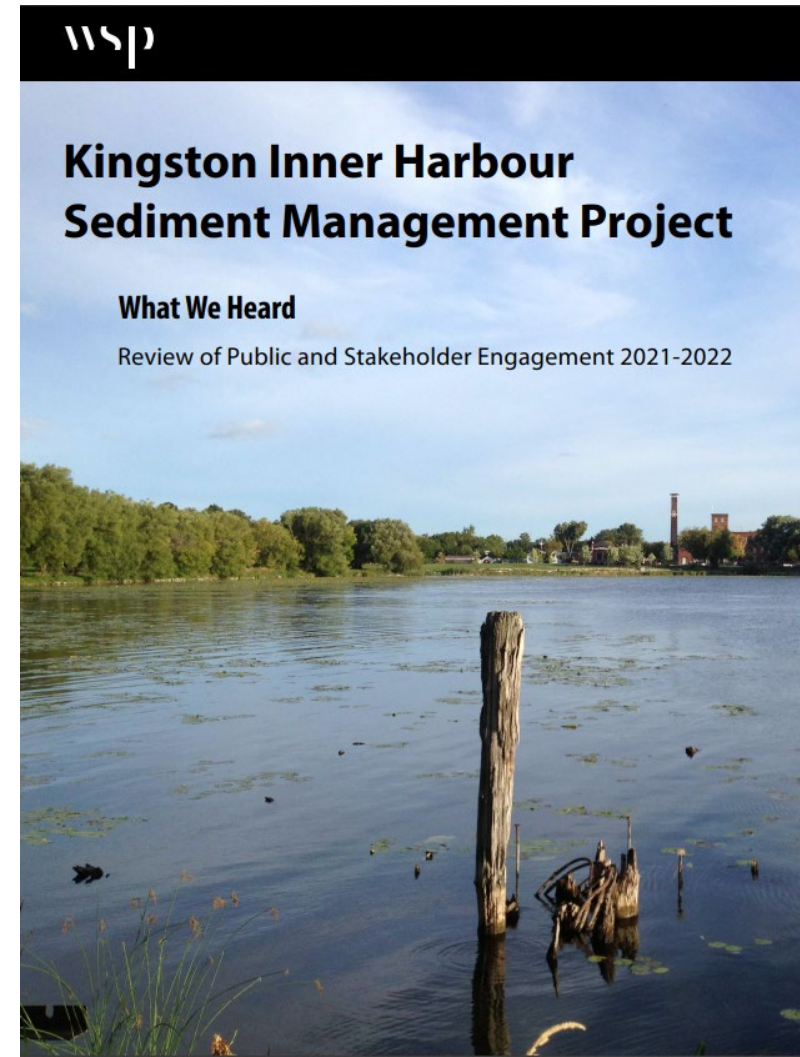
- Based on the potential ecological and human health risks from sediment contamination within KIH, a sediment management plan (SMP) including careful physical intervention has been recommended.
- An initial SMP in 2021 provided a conceptual approach for sediment management, and included dredging, capping, and shoreline revetments.
- The SMP is specific to individual “Management Units”
 - Allows for a customized approach based on localized conditions, habitat values, and property ownership.
 - Allows for physical intervention to be focused on areas of higher risk
 - Management Units remain the same in the updated (2023) conceptual SMP.



Recommended Management Strategy

ENGAGEMENT FEEDBACK TO DATE

- Recommendations for refinement to the 2021 SMP received from Indigenous and stakeholder engagement.
- Feedback from 2021-2022 stakeholder engagement has been summarized in the “What We Heard Report” available for download on the website [DocumentsEN - KIH Project \(kihproject-projetpik.ca\)](https://www.kihproject-projetpik.ca/DocumentsEN)
- Indigenous engagement and consultation is happening separately on a nation-to-nation basis and will be summarized in the Impact Assessment



Communication and Engagement

ENGAGEMENT FEEDBACK TO DATE

Summary of Participation

Visits to KIH Website	5,300+
Public Outreach Interactions	34 groups/individuals
Virtual Information Session Visitation	1,846 unique visitors over August, September and October of 2022
Comment Forms	24
Formal Meetings/Workshops	9
Online Advertisements:	167,000 + impressions



Communication and Engagement

ENGAGEMENT FEEDBACK TO DATE

Biophysical Environment



- Interest in research about existing wildlife, fish, and aquatic life (i.e., turtles, amphibians).
- Concerns related to vulnerable species.
- Questions on potential for contamination of drinking water and water bodies during remediation.
- Concerns related to sensitive wildlife habitats including bird nesting areas.
- Interest in how beaver activity might impact sediments and remediation efforts.

- Questions about historical contamination from past industrial activity.
- Questions about potential municipal chemical sources to harbour.
- Concerns related to the impacts to human health (i.e., existing contaminants as well as Project activities).
- Concerns related to consumption of fish caught in the harbour.
- Potential effects on infrastructure and operations in the harbour.
- Concerns on impacts to cultural, historical, and archaeological resources.

Human and Socio-Economic Environment



Project Logistics and Methodology



- Concerns related to dredging and effects to habitat or sediment disturbance.
- Interest in seeing additional studies on local hydrology, and current level of risk.
- Risks related to dewatering sediment and spreading of contaminants to new areas.
- Interest in green engineering methods (i.e., use of native species, shoreline habitat enhancement).
- Interest in Project costs and funding.
- Alignment with the City of Kingston's Master Plan.

Future Plans



- Protection for future generations.
- Interested in other developments that may also be planned in the area including along the waterfront.
- Environmental controls for preventing future contamination.

- Additional consultation and engagement activities about the Project with the community.
- Trouble navigating the Project website.
- Involvement of local businesses, clubs, and universities.
- Consultation with Indigenous communities.

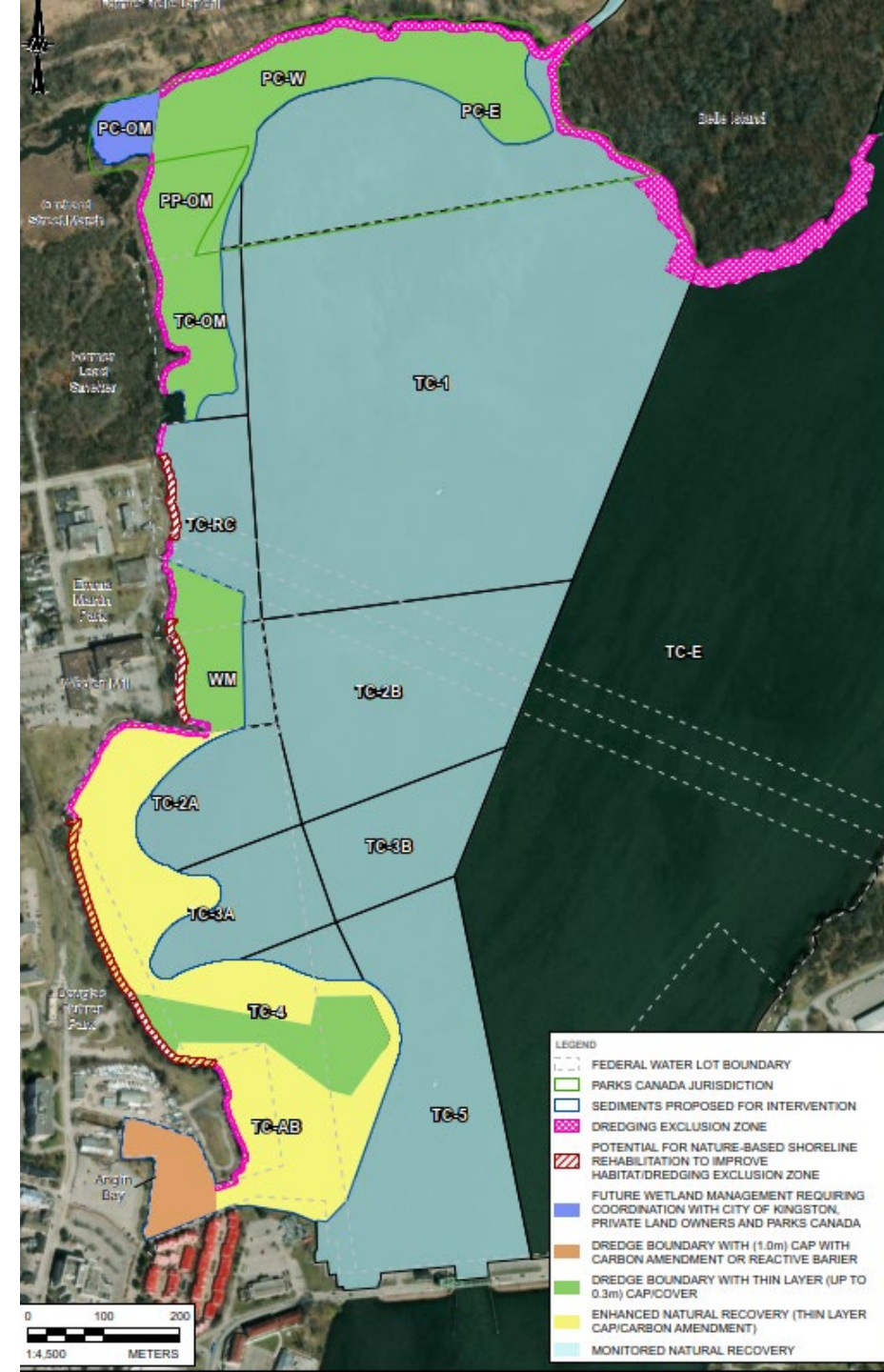
Engagement and Consultation



Recommended Management Strategy

UPDATED CONCEPTUAL SEDIMENT MANAGEMENT PLAN (SMP) - 2023

- The updated conceptual SMP incorporates the recommendations provided since Indigenous and stakeholder groups reviewed the initial conceptual SMP.
- Most of the updates reflect enhanced protection of shorelines and associated sensitive biological species, their habitats, and fluvial and lacustrine processes.
- The updated conceptual SMP is available for download on the Project website [DocumentsEN - KIH Project](https://kihproject-projetpik.ca/DocumentsEN) (kihproject-projetpik.ca)

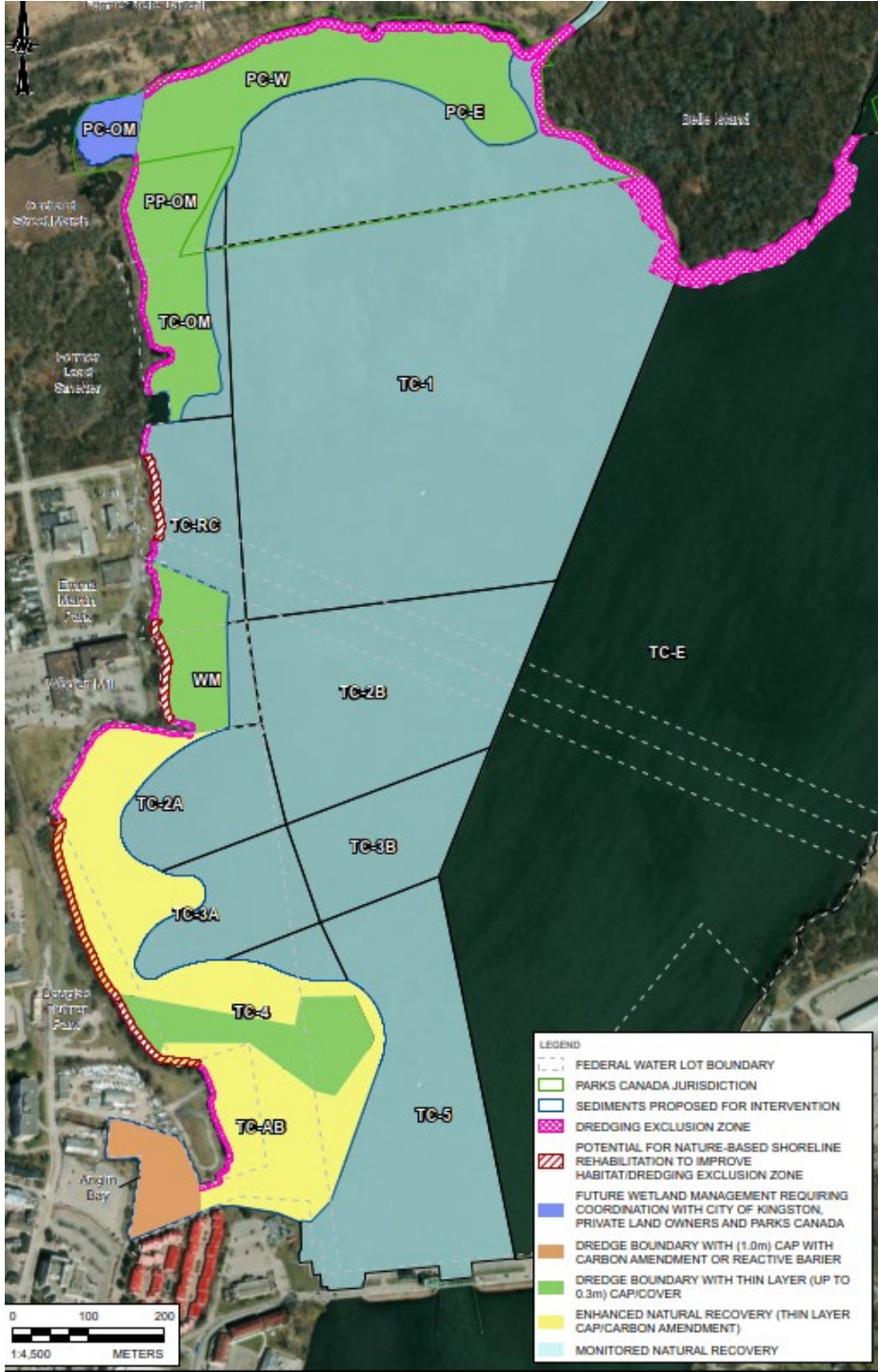


Recommended Management Strategy

UPDATED CONCEPTUAL SMP - 2023

Several key recommendations for refinements were incorporated into the updated SMP, including:

- The areas requiring physical intervention were generally reduced based on updated (2021) contaminant distribution and/or to protect sensitive species, habitats and valued features.
- Buffer zones (dredging exclusion zones) were added along all shorelines (except in Anglin Bay) to preserve the integrity of shorelines, protect sensitive habitats (e.g. turtle habitat), and archaeological features.
- A staged remediation plan was added where sediment management activities occur in wetland habitats and high-value turtle habitats to respect restricted timing windows or other sensitive periods.
- Nature-based shoreline rehabilitation rather than revetments were incorporated, and shoreline modifications considered the City's Waterfront Master Plan.
- Residual management covers (thin layer cap of clean sand, organic materials, activated carbon) were added to the plan for dredged areas to reduce bioavailability of any remaining contaminants and promote recolonization of benthic communities.



Recommended Management Strategy

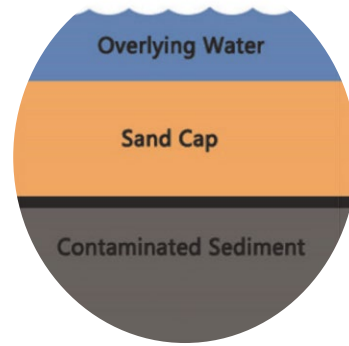
UPDATED CONCEPTUAL SMP - 2023

Management Units include one or a combination of these techniques that are safe and effective when applied carefully



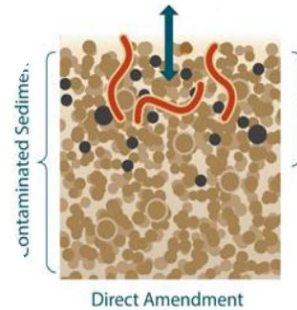
Dredging

Remove contamination where it cannot be effectively managed in place, limit to highest risk areas



Conventional capping

Isolation capping in Anglin Bay only



Enhanced Natural Recovery

Thin layer cover may include activated carbon to bind contaminants, and organic materials to promote rehabilitation of aquatic plants and benthic invertebrates



Nature-based Shoreline Rehabilitation

Enhances ecological habitat and prevents erosion













Monitored Natural Recovery

An important strategy for large areas of KIH; physical intervention is only recommended for higher risk areas where natural recovery is not effective

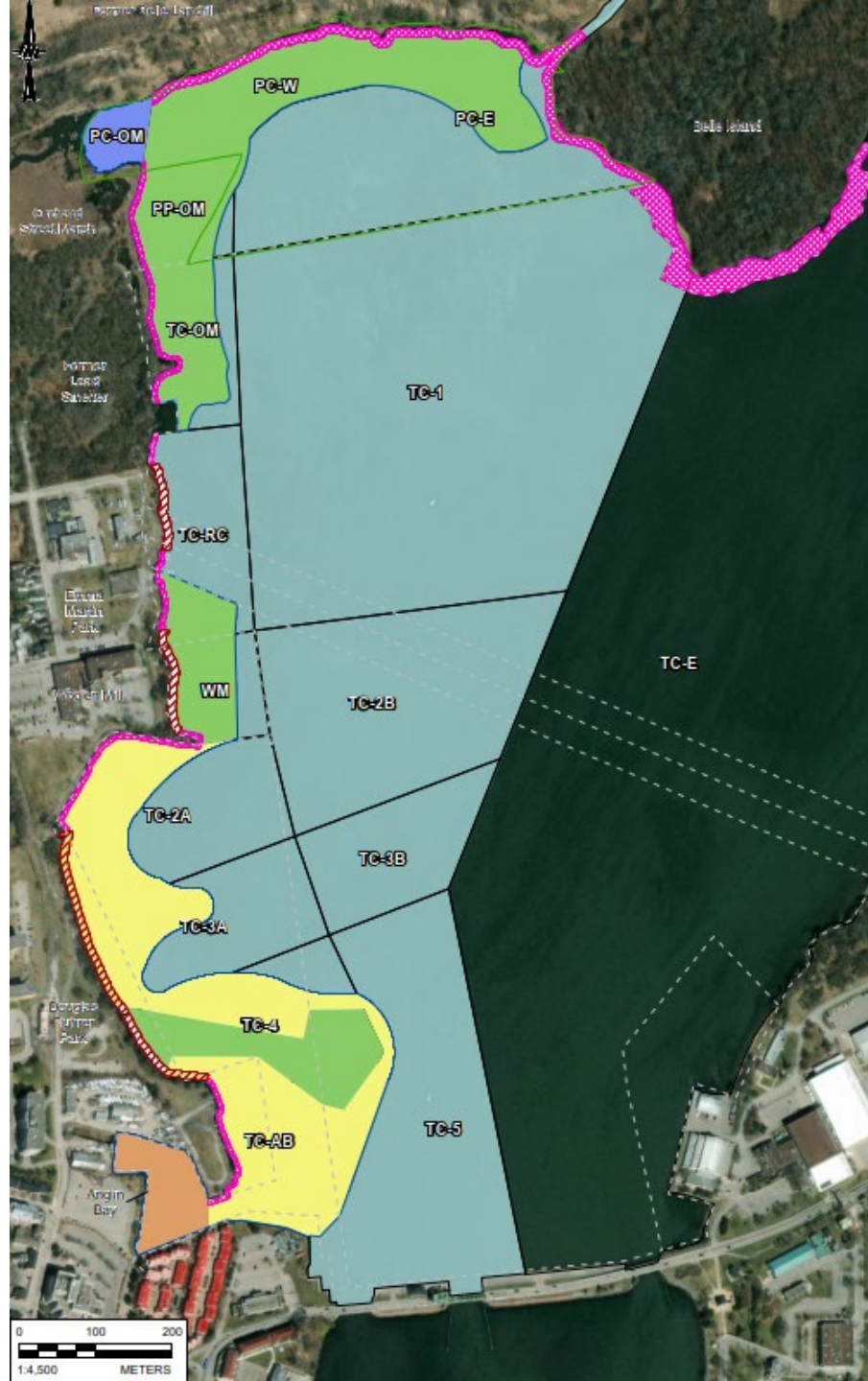
Recommended Management Strategy

Updated Conceptual SMP - 2023

LEGEND	
	FEDERAL WATER LOT BOUNDARY
	PARKS CANADA JURISDICTION
	SEDIMENTS PROPOSED FOR INTERVENTION
	DREDGING EXCLUSION ZONE
	POTENTIAL FOR NATURE-BASED SHORELINE REHABILITATION TO IMPROVE HABITAT/DREDGING EXCLUSION ZONE
	FUTURE WETLAND MANAGEMENT REQUIRING COORDINATION WITH CITY OF KINGSTON, PRIVATE LAND OWNERS AND PARKS CANADA
	DREDGE BOUNDARY WITH (1.0m) CAP WITH CARBON AMENDMENT OR REACTIVE BARRIER
	DREDGE BOUNDARY WITH THIN LAYER (UP TO 0.3m) CAP/COVER
	ENHANCED NATURAL RECOVERY (THIN LAYER CAP/CARBON AMENDMENT)
	MONITORED NATURAL RECOVERY

Provides both localized and harbour-wide reductions of contaminants of concern to reduce risks.

Provides high efficiency of chemical removals per unit of effort spent, such that the positives of chemical risk reduction outweigh short-term disruptions.



Relies on natural recovery processes in areas that currently have risks that are negligible to low.

Provides removal and/or isolation of contaminants compatible with potential redevelopment of the shoreline including recreational uses of the water lots.

Provides potential for recolonization and rehabilitation of affected areas; and where possible achieve conservation gains of improved habitat conditions.

Prevents or limits the degree of habitat disruption during project works, particularly for sensitive ecological components

Prevents unacceptable resuspension/ release of contaminants during project works, mitigating impairment of water quality.

Recommended Management Strategy

SOURCE CONTROL AND POTENTIAL FOR RECONTAMINATION

- Legacy sources of contamination have been controlled and on-going source control is being confirmed before implementing the SMP to prevent recontamination.
- In urban areas and working harbours, it is impossible to eliminate all diffuse chemical inputs, particularly from storm sewer outfalls.
- Requirements for the SMP to remain effective over the long term include:
 - Proper management and monitoring of current source controls (e.g. Belle Park Landfill leachate collection, Emma Martin Park barrier, Former Davis Tannery clay berm, CSO events).
 - Careful development of brownfield areas along the shoreline (e.g., Orchard Street Marsh)
 - Effective storm sewer management
- Water quality studies have begun since the original SMP to help inform whether current source controls are sufficient.



Current Status

ONGOING SITE CONDITION STUDIES

- Sediment quality study to further define vertical extent of contamination and provide an updated reference condition characterization.
- Surface water quality study to establish baseline conditions and confirm source controls are effectively minimizing inputs to KIH
- Additional baseline studies to help evaluate potential ecological effects, including aquatic vegetation, benthic invertebrates and aquatic wildlife. Work planned for 2024 includes additional turtle monitoring field studies to identify the extent of overwintering habitat present within KIH. If any other biological fieldwork is required an update will be posted to the KIH website.
- Results will be used to support the Detailed Impact Assessment in 2024 and the detailed design (2024-2025).

Current Status

IMPACT ASSESSMENT

- Detailed Impact Assessment (DIA) is being prepared, following requirements of the Canadian *Impact Assessment Act* and Parks Canada *Impact Assessment Directive*
 - The DIA process will continue to incorporate Indigenous and stakeholder feedback received during detailed design
- Conceptual Constraints and Impact Considerations (CCIC) document has been prepared that provides a preliminary, high-level consideration of Project impacts. It includes:
 - Identification of Valued Components (VCs)
 - Desired outcomes, thresholds, potential design considerations, potential constraints and information gaps for each VC
 - The CCIC is available for download on the Project website [DocumentsEN - KIH Project \(kihproject-projetpik.ca\)](https://www.kihproject-projetpik.ca/DocumentsEN)



Current Status

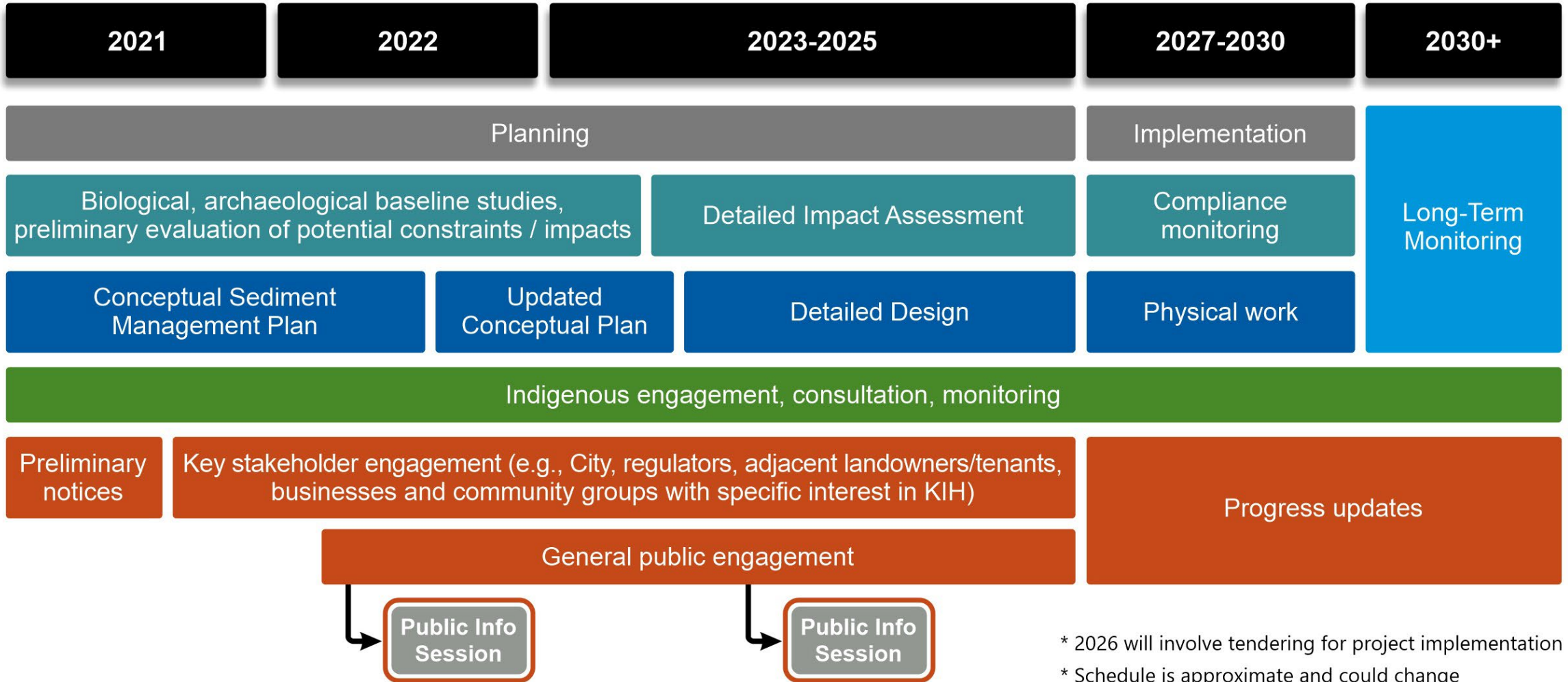
IMPACT ASSESSMENT

- The CCIC helped inform the updated SMP and will be integrated into the DIA
- The DIA will determine if the project may cause significant adverse environmental effects
- Mitigation measures to prevent or minimize adverse effects will be identified and implemented
- An environmental management plan will be developed, and the project will be monitored to ensure compliance with requirements
- The DIA will identify opportunities for improving habitat that is already impacted or not functioning properly for the wildlife that need to use it
- Indigenous and stakeholder engagement will continue throughout the DIA process



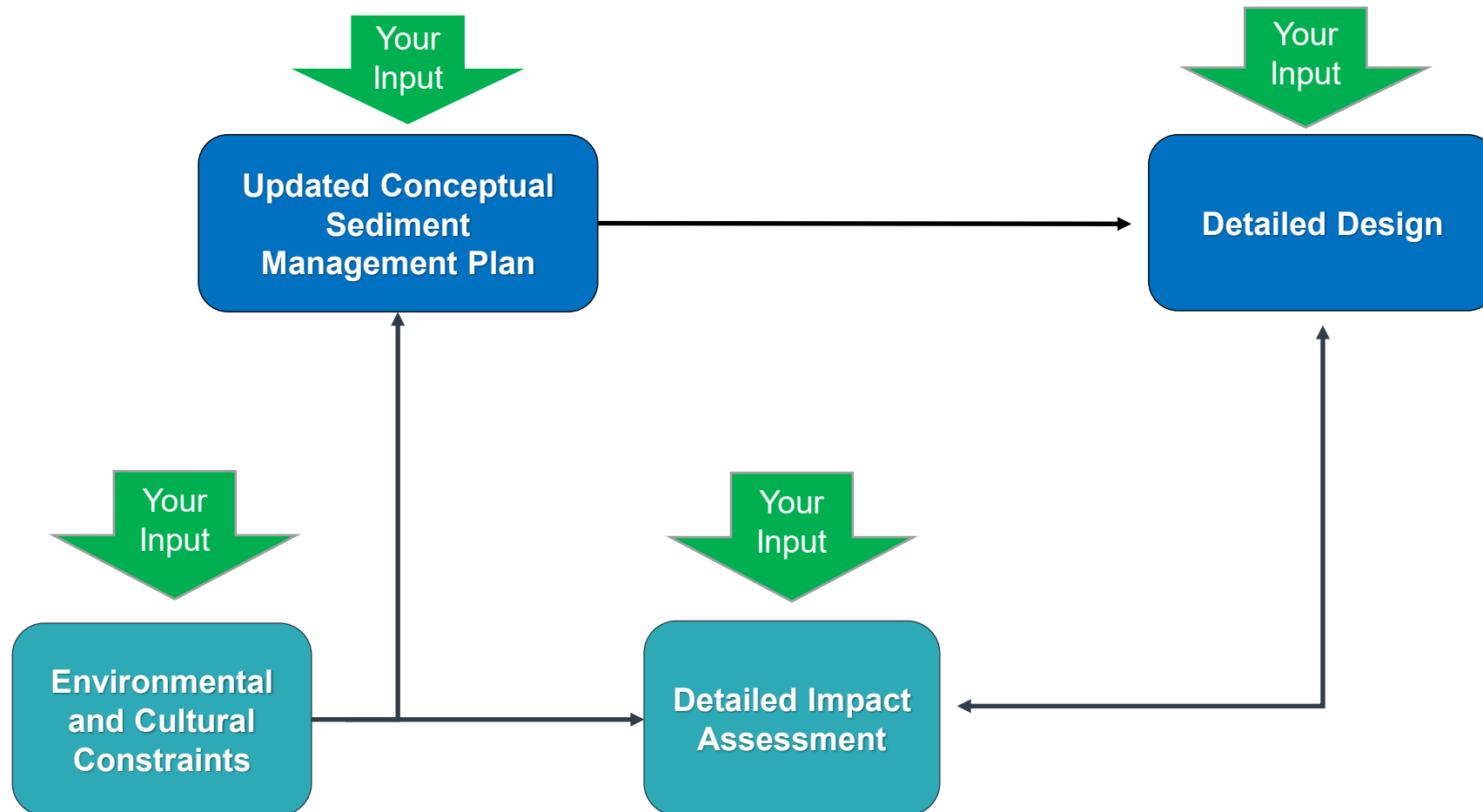
Next Steps

PROJECT SCHEDULE



Next Steps

OPPORTUNITIES FOR ENGAGEMENT



Check <http://www.kihproject-projetpik.ca> for updates