Don Mouth Naturalization And
Port Lands Flood Protection Project

Appendix M

Criteria, Measures and Indicators for Effects Assessment

Toronto and Region Conservation for The Living City

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Appendix M. Criteria, Measures and Indicators for Effects Assessment

Table M-1 Construction Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Objective 1: Naturalization			
Changes to Aquatic Habitat	• Disruption, destruction, and alteration of aquatic habitat	• Estimate the amount and types / quality of existing aquatic habitat that will be disrupted, destroyed, or altered due to construction	• Aquatic Environment
Effects to Aquatic Species	• Nuisance effects on aquatic species from construction (noise, dust, vibration, sediment release, etc.)	• Qualitative assessment of changes to species behaviour resulting from nuisance effects	• Aquatic Environment
Changes to Naturalization (Terrestrial / Wetland) Habitat	• Removal or disturbance of naturalization habitat	• Estimate the amount and types / quality of existing naturalization habitat that will be removed or disturbed due to construction.	• Terrestrial / Wetland Environment
Effects to Terrestrial Species	• Nuisance effects on terrestrial species from construction (noise, dust, vibration, sediment release etc.)	• Qualitative assessment of changes to species behaviour resulting from nuisance effects	• Terrestrial / Wetland Environment
Objective 2: Flood Protection			
Management of Stormwater During Rainfall Storm Event	• Effects of erosion during rainfall and flood events within the construction area	• Qualitative assessment of effects of rainfall storm event	• Aquatic Environment
Potential to Impact Flooding Conditions On-site During Construction	• Extent of flooded areas within the construction area	• Qualitative assessment of effects of phasing on flooding conditions	• Flooding
Potential to Impact Flooding Conditions Elsewhere	• Extent of flooding that will continue to occur in developed areas or beyond the Project Study Area in Spill Zones 1 and 2	• Area outside of construction area flooded during storm events	• Flooding
Objective 3: Operational Management and Constructability			
Management of Stormwater Related to Precipitation Events	• Extent of areas inundated by stormwater runoff related to precipitation events	• Qualitative assessment of the potential effects related to stormwater quality and quantity including runoff and surface water ponding	• Lake / River Water Quality
Changes to Sediment and Debris Management During Construction	• Effects to habitat as a result of changes to management activities during construction	• Qualitative description of implications of phasing on sediment and debris management activities	• Aquatic Environment (sediment quality and quantity, aquatic biota, aquatic habitat)

Table M-1 Construction Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Effects from Construction on Lake and River Water Quality	• Effects of in-water and near shore works on water quality	• Qualitative assessment of the effects of in-water and near shore works on water quality	• Lake / River Water Quality
	• Ability to manage sediment and debris during construction activities	• Qualitative assessment of the sediment and debris management activities during construction	• Hydrology and Surface Water (lake / river water quality)
Implications of Phasing on Port Operations	• Loss of potential mooring revenue	• Estimate the length of dockwall modified or buried by reach	• Economic Base
Total Cost of Construction	• Total cost associated with constructing the DMNP	• Estimated cost of constructing the project	• Economic Base
Objective 4: Integration with Infrastructure			
Changes to Existing and Planned Roads and Bridges Solely Due to DMNP	• Nuisance effects as a result of modifications to Lake Shore Boulevard at the Don Roadway, Keating Channel bridge, Villiers Street, Polson Slip bridge, Commissioners Street, and Basin Street	• Compare predicted access during construction to existing conditions, and estimate their effects on existing and future businesses, residents and recreational users • Compare anticipated noise levels during construction to existing conditions, and estimate their effects on existing and future businesses, residents and recreational users • Compare anticipated air quality levels during construction to existing conditions, and estimate their effects on existing and future businesses, residents and recreational users	• Atmospheric Environment / Existing Land Use / Infrastructure and Utilities
Changes to Existing Rail Lines or Yards or Access Roads Leading to Rail Yards	• Nuisance effects as a result of modifications to rail lines, yards or access roads (e.g., Harbour Lead spur and yard, Keating Yard, GO Transit / Don Yard)	• Compare predicted access during construction to existing conditions, and estimate their effects on existing and future businesses, residents and recreational users • Compare anticipated noise levels during construction to existing conditions, and estimate their effects on existing and future businesses, residents and recreational users • Compare anticipated air quality levels during construction to existing conditions, and estimate their effects on existing and future businesses, residents and recreational users	• Atmospheric Environment / Existing Land Use

Table M-1 Construction Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)

Changes to Existing, Planned and Proposed Underground Utilities Due to Location of Floodplain and Low Flow Channel	• Disturbance and / or displacement of underground utilities due to locations of the floodplain and low flow channel, including:
	  • Enbridge gas pipeline
	  • Water and wastewater utilities
	  • Hydro One Networks Inc. (HONI) underground circuits
	  • Other underground utilities
		• Estimate the types of underground utilities that will be disrupted, removed or relocated due to construction	• Atmospheric Environment / Existing Land Use / Infrastructure and Utilities

	• Nuisance effects as a result of modifications to underground utilities due to location of the floodplain and low flow channel	• Compare predicted servicing during construction to existing conditions, and estimate their effects on existing businesses and recreational users • Compare anticipated noise levels during construction to existing conditions, and estimate their effects on existing businesses and recreational users • Compare anticipated air quality levels during construction to existing conditions, and estimate their effects on existing businesses and recreational users	• Atmospheric Environment / Existing Land Use / Infrastructure and Utilities

Changes to Existing Above Ground Utilities	• Disturbance and / or displacement of above ground utilities due to location of the floodplain and low flow channel, including:
	  • HONI overhead lines and towers, including the hydro bridge
	  • Other utilities (assuming bridge lengthened or buried underneath the river)
		• Estimate the types of above ground utilities that will be disrupted, removed or relocated due to construction	• Atmospheric Environment / Existing Land Use / Infrastructure and Utilities

	• Nuisance effects as a result of modifications to the hydro bridge, HONI overhead lines and towers and other utilities (assuming bridge lengthened or buried underneath the river)	• Compare predicted access during construction to existing conditions, and estimate their effects on existing businesses and recreational users • Compare anticipated noise levels during construction to existing conditions, and estimate their effects on existing businesses and recreational users • Compare anticipated air quality levels during construction to existing conditions, and estimate their effects on existing businesses and recreational users	• Atmospheric Environment / Existing Land Use / Infrastructure and Utilities

Table M-1 Construction Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Changes to Dockwalls	• Nuisance effects as a result of modifications to dockwalls	• Compare predicted access during construction to existing conditions, and estimate their effects on existing and future businesses and recreational users • Compare anticipated noise levels during construction to existing conditions, and estimate their effects on existing and future businesses and recreational users • Compare anticipated air quality levels during construction to existing conditions, and estimate their effects on existing and future businesses and recreational users	• Atmospheric Environment
Costs of Infrastructure Modification/Relocation Associated with DMNP	• Total cost of infrastructure modification / relocation	• Estimate cost of modification / relocation of infrastructure during construction	• Economic Base
Objective 5: Recreational and Cultural Opportunities			
Effects on Recreational Users from Construction	• Nuisance effects (noise, dust and combustion emissions) from construction activities in the vicinity of recreational uses	• Compare anticipated noise levels during construction to existing conditions, and estimate their effects on recreational users • Compare anticipated air quality levels during construction to existing conditions, and estimate their effects on recreational users	• Atmospheric Environment / Land-based and Marine Recreation
Effect from Construction on Archaeological Resources	• Significance of archaeological resources within floodplain and low flow channel	• Estimate predicted effects on archaeological resources given what is known about the area	• Archaeological Resources
Effect from Construction on Traditional Uses of Lands by Aboriginal Peoples	• Extent of traditional uses of lands within floodplain and low flow channel	• Compare predicted effects on traditional uses to existing conditions	• Aboriginal Interests
Changes to Use of River Mouth for Boating	• Effects of construction on recreational boating	• Compare predicted navigational constraints for recreational boating during construction to existing conditions	• Land-based and Marine Recreation
Changes to Existing Pedestrian / Cycling Trails	• Effects of construction on existing pedestrian / cycling trail access	• Compare predicted trail access during construction to existing conditions	• Land-based and Marine Recreation
Displacement of Built Heritage Resources as a Result of the DMNP	• Effects to cultural heritage value (changes to structures) of built heritage resources and cultural heritage landscapes within low flow channel or floodplain	• Compare predicted value of cultural heritage resources (and qualitative value of landscape resources) during construction to existing conditions	• Built Heritage and Cultural Landscape Resources

Table M-1 Construction Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Effects of Visual Landscape Due to Sediment and Debris Management / Construction Equipment (cranes, debris booms, hydraulic dredge, etc.)	• Changes to visual landscape due to construction and maintenance equipment	• Compare predicted visual impacts during construction and sediment and debris management to existing conditions	• Visual Effect
Objective 6: Co-ordination with Other Planning Initiatives			
Removal of, or Changes to, Existing Land Use	• Number and type of displaced and disrupted land uses	• Compare predicted changes in land use to existing conditions	• Existing Land Use
Employment Created from Construction Activities	• Changes in employment levels (direct and indirect)	• Compare predicted employment levels to existing conditions	• Economic Base
Effects from Construction Activities on Future Residential and Business Uses	• Nuisance effects from construction activities on future residential and business uses within the Project Study Area	• Compare predicted access during construction to future conditions, and estimate their effects on future businesses and residents • Compare anticipated noise levels during construction to future conditions, and estimate their effects on future businesses and residents • Compare anticipated air quality levels during construction to future conditions, and estimate their effects on future businesses and residents	• Atmospheric Environment
Objective 7: Consistency with Waterfront Toronto Sustainability Framework			
Effects of Transporting Soils Off-site	• Nuisance effects (traffic, noise, dust, combustion emissions) associated with transportation of soils off-site	• Qualitative assessment of nuisance effects based on the maximum truck volume loads per day used to transport soils off-site	• Atmospheric Environment
Environmental Implications of Soil Management Activities During Construction	• Nuisance effects (noise, dust, combustion emissions) associated with excavation, on-site movement, and stockpiling of contaminated materials	• Qualitative assessment of nuisance effects associated with excavation, on-site movement, and stockpiling of contaminated materials	• Atmospheric Environment / Existing Land Use / Infrastructure and Utilities
	• Effects on soils from excavation	• Qualitative assessment of effects on soils from excavation	• Geology and Soils

Table M-1 Construction Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Environmental Implications of Groundwater Management Activities During Construction	• Contaminated groundwater requiring treatment / management	• Qualitative assessment of the environmental implications of groundwater management activities during construction	• Groundwater Quality
Total Cost of Soil Management	• Total cost associated with managing soil associated with the DMNP	• Total cost related to the management of soil based on the volume of soil excavated from the site and the average cost per tonne for treatment and disposal	• Geology and Soils

Table M-2 Establishment / Post-Establishment Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
1. Naturalization Objective			
Area and Function of Wetland Habitat Types Created	• Area and type of wetland habitat created	• Measure increase in total area of wetland and description of habitat type created	• Wetland Environment
	• Largest single circular wetland patch size	• Measure the largest circle within the wetland patch	• Wetland Environment
Potential to Create Ecosystem Function for Wildlife Species and Communities	• Performance of wetland habitat	• Qualitative assessment of activities that will ensure performance of wetland habitat	• Wetland Environment
	• Area of terrestrial habitat created	• Measure total area	• Terrestrial Environment
	• Species that will use habitat for breeding purposes	• Qualitative assessment of the species that are anticipated to use habitat for breeding purposes	• Terrestrial Environment
Effects on Native Fish Habitat or Aquatic Communities	• Total area of aquatic habitat (including each type of aquatic habitat created)	• Measure total area	• Aquatic Environment
Effects of Hydraulics and Hydrology / Sedimentation on Sustainability of Vegetation Communities and Associated Fauna	• Management of full range of flows without adverse impact on vegetation communities (e.g., high erosional stress, sediment deposits)	• Frequency of inundation of lake-connected wetlands • Median water level in low flow channel. • Evaluation of hydraulic model output with respect to vegetation survivability • Potential for sediment deposition to affect vegetation survivability • Potential for sedimentation to affect channel form and associated vegetation • Qualitative assessment of ability of communities to adapt to climate change	Wetland Environment / Aquatic Environment
Effects on Wildlife Species or Communities *(i.e., minimizing disturbance and connecting habitat)*	• Enhancement for migratory bird habitat (internal linkages as well as links external to the DMNP to both existing and planned habitat)	• Compare predicted linkages to existing conditions	• Terrestrial Environment
	• Disturbance to communities as a result of fragmentation and nuisance behaviour from human activity	• Qualitative assessment of the potential effects of adjacent human activity on wetland survivability	• Wetland Environment
Effects of Water Quality on Wetland and Aquatic Habitat	• Response of vegetation communities to changes in water quality, including from sediment management activities	• Compare future to current water quality within the Keating Channel • Qualitative assessment of water quality within the low flow channel, and the lake-fed wetlands	• Wetland Environment / Aquatic Environment

Table M-2 Establishment / Post-Establishment Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
2. Flood Protection Objective			
Potential to Impact Flooding Conditions Elsewhere	• Extent of flooding that will continue to occur in developed areas or beyond the Project Study Area in Spill Zones 1 and 2	• Results of regulatory flood hydraulic modelling regarding water elevations at CN bridge.	• Flooding / Existing Land Use / Infrastructure and Utilities
	• Change in assessment values as a result of removal of flood risk	• Compare predicted future assessment values to baseline	• Existing Land Use / Planned Land Use
Resilience of stabilization Works for Valley, Low Flow Channel, and Levees	• Ability of stabilization works to maintain structural integrity of river valley, low flow channel, and levees	• Qualitative assessment of the potential effects of flood events on structural integrity of stabilization	• Flooding
3. Operational Management and Constructability Objective			
Potential Changes to Stormwater Quality and Quantity	• Change in amount of impervious cover	• Compare predicted changes in amount of impervious cover to existing conditions	• Stormwater Quality and Quantity
Effects of Operational Management on Water Quality	• Changes in water quality related to sediment management activities	• Qualitative assessment of the effects on water quality associated with future sediment management activities	• Lake / River Water Quality
Effects to Port Operations	• Changes to Toronto Port Authority works yard operations	• Compare predicted operations during post-establishment to existing conditions	• Existing Land Use
	• Changes to Port operations	• Compare predicted loss of dockwall post-establishment to existing conditions • Velocities in Ship Channel during spill events	• Existing Land Use
	• Changes to shipping activities	• Qualitative assessment comparing predicted effects on shipping activities during post-establishment to existing conditions	• Existing Land Use
Annual Operations and Maintenance Costs	• Annual cost of sediment and debris management activities	• Compare predicted costs to existing (if any)	• Economic Base
	• Annual cost of maintaining flood protection works, including weirs	• Compare predicted costs (if any) to existing costs (if any)	• Economic Base
4. Integration with Infrastructure Objective			
Roadway / Bridge Maintenance	• Long-term maintenance implications for Lake Shore Boulevard, Cherry Street, Don Roadway, Commissioners Street, Basin Street, and Gardiner Expressway substructures	• Qualitative assessment of implications of flood events on maintaining naturalized system	• Infrastructure and Utilities

Table M-2 Establishment / Post-Establishment Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Provision for Water-Based Emergency Services	• Ability of water-based emergency services to navigate new river valley system	• Qualitative assessment of the ability of water-based emergency services to navigate new river	• Infrastructure and Utilities
Effects on Maintaining Servicing	• Effects of maintaining servicing on the new river valley system and low flow channel	• Qualitative assessment of effects of maintaining servicing on the naturalized area once it is established	• Infrastructure and Utilities
5. Recreational and Cultural Opportunities Objective			
Changes to Use of River Mouth and Inner Harbour for Recreational Boating	• Compatibility of recreational boating activities with naturalization	• Compare predicted post-establishment areas for recreational boating to existing conditions	• Marine Recreation
Recreational Users' Enjoyment of Parkland and Trails	• Effects of increased parkland and trails on users' enjoyment	• Describe predicted effects on user enjoyment of parks and trails	• Land-based Recreation
Effects on Recreational Users from Operations Nuisances	• Nuisance effects (noise, dust, combustion emissions) from sediment and debris management equipment in the vicinity of recreation uses	• Compare current dust levels to those predicted during operations	• Atmospheric Environment / Land-based and Marine Recreation
Effects to Visual Landscape Due to Sediment and Debris Management Equipment (cranes, debris, booms, hydraulic, dredge, etc.)	• Changes to visual landscape due to equipment	• Compare predicted views of the equipment to existing conditions	• Visual Effect
6. Co-ordination with Other Planning Initiatives Objective			
Consistency with the Intent of the Central Waterfront Secondary Plan	• Consistency of DMNP with objectives of Central Waterfront Secondary Plan (cross referenced to other indicators as appropriate)	• Qualitative assessment as to whether the plans fall within the Plan	• Planned Land Use
Consistency with Planning Policies and Planning Studies (Currently Underway and Completed)	• Consistency of project with Lower Don Lands Master Plan, Keating North Precinct Plan, Gardiner Expressway Individual EA, and Official Plan Amendment for the Project Study Area, and other planning studies and projects in the vicinity of the Project Study Area	• Qualitative assessment of project's consistency with these plans	• Planned Land Use
	• Consistency with the Provincial Policy Statement (PPS), *Places to Grow Act* and the Growth Plan for the Greater Golden Horseshoe (Growth Plan)	• Qualitative assessment of project's consistency with the PPS, *Places to Grow Act* and the Growth Plan for the Greater Golden Horseshoe (Growth Plan)	• Planned Land Use

Table M-2 Establishment / Post-Establishment Criteria Table (by Objective)

Criteria	Indicator(s)	Measurement	Environmental Component(s)
Nuisance Effects on the Planned Surrounding Communities	• Nuisance effects from sediment and debris management equipment in the vicinity of residential uses	• Estimate post-establishment noise, dust and combustion emissions levels, and their effects on planned communities	• Atmospheric Environment / Planned Land Use
7. Consistency with Waterfront Toronto Sustainability Framework Objective			
Soil Quality as a Result of the DMNP	• Soils that meet O.Reg. 154/04	• Qualitative assessment of the soil quality within the new floodplain as a result of the project	• Geology and Soils
Reuse of Clean Sediment for Beneficial Purposes	• Ability to reuse clean sediment for beneficial purposes	• Qualitative assessment of opportunities to reuse clean sediment for beneficial purposes	• Geology and Soils