

## Memorandum

**To:** Marc Forrester- Northland Development Corporation  
**From:** Sam Morgan- Senior Coastal Consultant  
**Date:** 26 June 2020  
**Subject:** Ōruku Landing Dredging- Coastal Processes Impact Assessment

### Scope

4Sight Consulting Ltd (4Sight) has been commissioned by Northland Development Corporation (NDC) to provide a desktop analysis of potential changes to the local coastal processes regime that may arise from the proposed dredging associated with Ōruku Landing Development at Riverside Drive, Whāngārei.

It is understood that the dredging area is approximately 1.1Ha and requires on average an excavation depth in the order of 1.5m with the volume of dredging including overdredging required estimated approximately 25,000m<sup>3</sup>.

### Site and Physical Processes Description

The subject site is situated on the true left bank of the Hātea River within the upper reaches of Whangārei Harbour (**Figure 1**). The Hātea sub catchment of the Whangārei Harbour catchment covers 4,470 hectares (15%) of the greater harbour catchment.

Physical processes at the site are thought to be dominated by tidal exchange and river flows. The tidal range in Whangārei Harbour is approximately 3m and **Table 1** below provide the major tidal variables from Whangārei Harbour. Anecdotal, peak current flows in the subject area are in the order 0.75-1m/s (*pers. comm.* Andrew Johnson, Total Marine).

Wave energy at the site is not considered to be a substantive contributor to the coastal processes regime due to the limited fetch available for the generation of wind waves. The potential for boat wake to be generated is also considered to be limited due to the 5knt navigation speed limit operating in the area.

The site itself sits within a relatively straight section of the river, suggesting reasonably linear current flows through the proposed dredging area. The majority of the adjacent shoreline is characterized by a vertical concrete seawall which transitions into a varying modified/naturalistic bank. The opposing side of the river is characterized by a mooring area and coastal protection structures of varying forms.

Sediment collected from the dredging area for the ecological investigations was characterized as silts (or smaller) with only minor fractions of fine sand detected. Photographs of the material indicate the material to be relatively loosely bound estuarine muds, indicating either recent deposition or regular resuspension. Based upon the amount of maintenance dredging required from adjoining areas it is assumed there are reasonably high sediment inputs to the system.

Table 1: Whangārei Harbour Tidal Variables

Tidal Variable	Chart Datum (m)
Mean High Water Springs (MHWS)	3
Mean High Water Neaps (MHWN)	2.6
Mean Sea Level (MSL)	1.8
Mean Low Water Neaps (MLWN)	1.1
Mean Low Water Springs (MLWS)	0.50

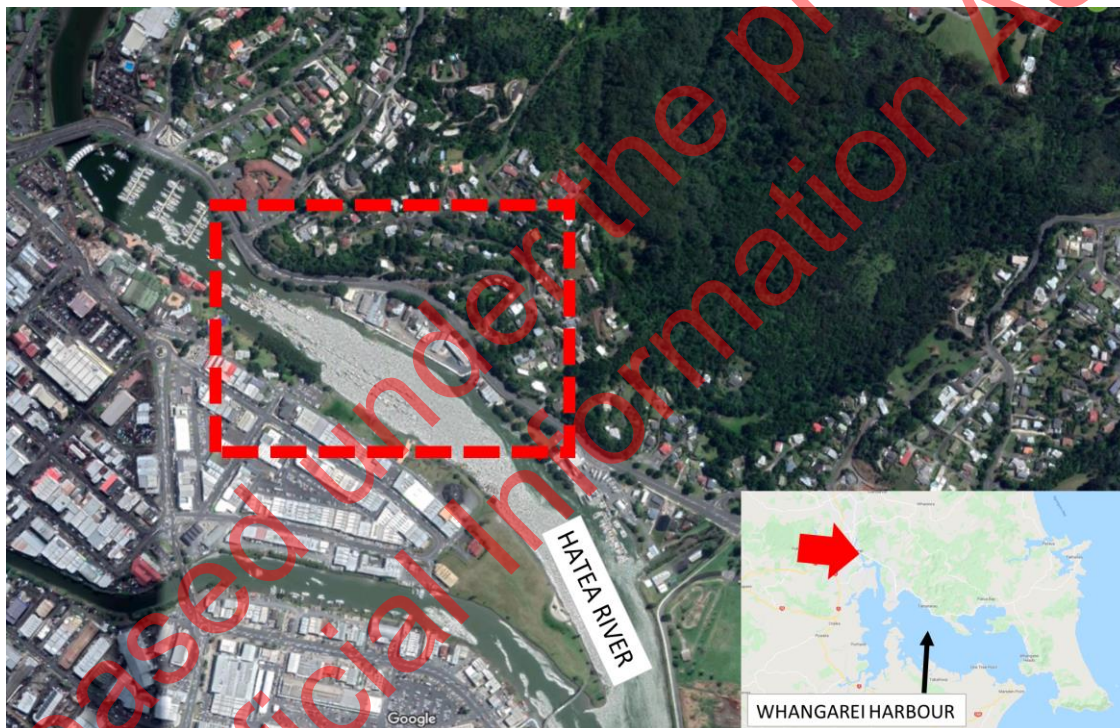


Figure 1: Location of proposed development area

**Adjacent Dredging Works**

As noted above, significant dredging works occur both up and downstream from the site (Figure 2). The total dredge area is approximately 17Ha with capital dredging volumes in excess of 120,000m<sup>3</sup> and annual maintenance dredging in the order of 30,000m<sup>3</sup>.



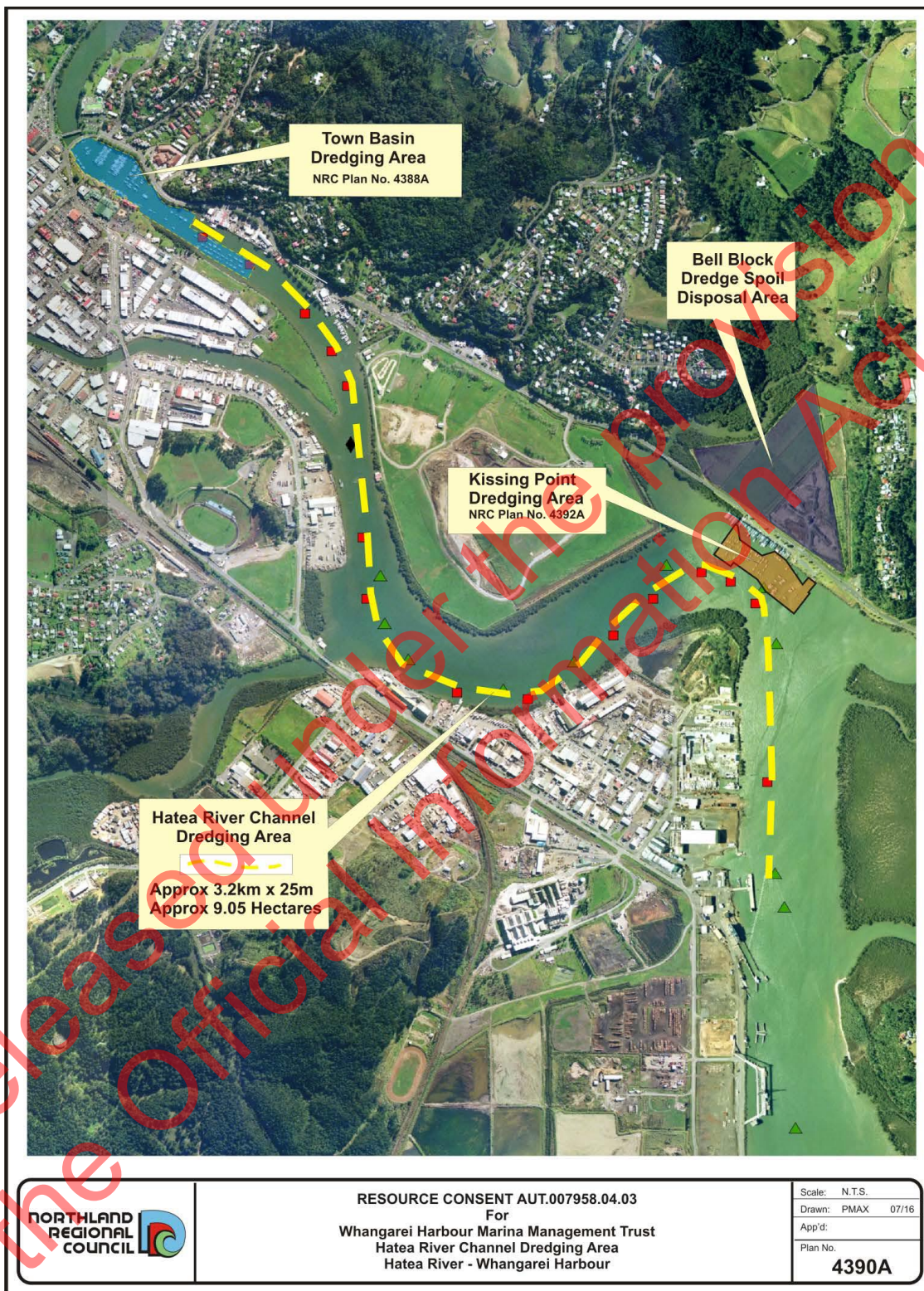


Figure 2: Map of current dredging works up and downstream of the subject site (Source: NRC)



**Coastal Processes Impact Assessment**

As noted above the proposed dredging works are in the order of 25,000m<sup>3</sup> over an approximate area of 1.1Ha. As per the proposed dredging plan the below (**Figure 3**) the primary dredging area is approximately 1.4Ha with the remaining area composed of a 1:6 batter to the adjacent shoreline. The Town Basin dredging area immediately abuts the proposed dredging area.

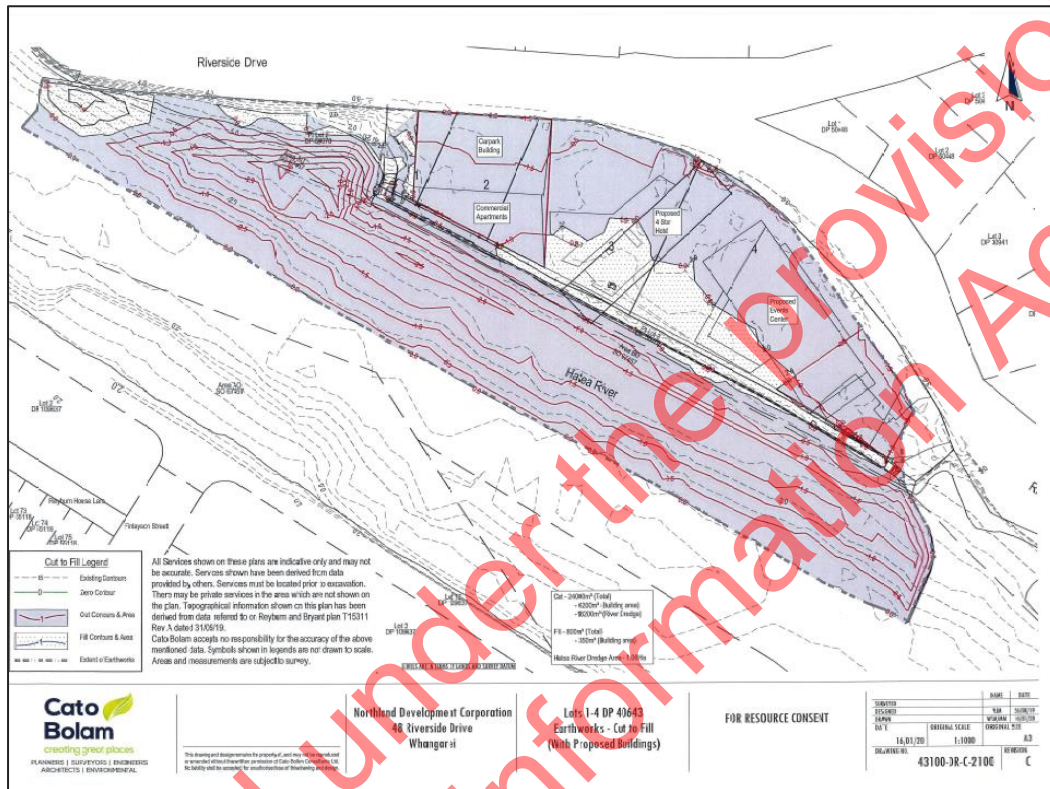


Figure 3: Plan view of proposed dredging works

Capital works dredging will result in the creation of a sediment sink for which is expected to result in increased sedimentation rates in the subject area (Note: the sediment supply regime will not be affected by the proposed) The exact change in sedimentation rate is difficult to determine due to the lack of existing information, however this is expected to be managed by a maintenance dredging regime of up to 10,000m<sup>3</sup> per year (*pers. comm.* Andrew Johnson, Total Marine).

As mentioned above the subject dredging area sits within a relatively straight section of the river which suggests reasonably linear current flows. For this reason and considering the degree of modification in the adjoining areas no substantive change in the existing current/hydrodynamic regime is likely.

Deepening water can result in increased translation of wave energy to adjoining shorelines. In this instance the likelihood of increased wave activity is considered to be negligible due to the low wave energy setting. Further, the adjoining shorelines are armed which will prevent erosion issues from increased wave activity.

Overall, the proposed dredging regime represents a 10-12% increase in the spatial extent of dredging in the general lower Hātea River. Further, the area is considered to be significantly modified with numerous coastal protection structures and mooring areas (and associated structures) presenting physical impediments to the natural coastal processes regime. For these reasons and those noted above the potential effects to arise from the proposed dredging works are expected to be less than minor.