APPENDIX H

Navigational Safety Assessment

Te Pūwaha – Whanganui Port Redevelopment

Navigation Safety Assessment

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Executive Summary

Te Pūwaha – Whanganui Port redevelopment includes rebuilding two wharves and constructing an area for a travel lift and associated hard stand area ashore. In addition, there will be other redevelopment and new buildings constructed ashore. A large area of reclamation is also proposed to create public open space along with the closure of the south-east access channel. Dredging work will also likely be part of the redevelopment.

Te Pūwaha improves navigation safety by providing 'fit for purpose' facilities in a planned and integrated format. In general, existing navigation safety rules should be sufficient to manage any navigation safety implications that could arise. There appears to be sufficient space for the type of vessels that currently use the Port Basin area to manoeuvre around any planned new structures and the planned increased depth of water in the area near the wharves will effectively provide more useable space than in the current situation. Marking the edge of the proposed travel lift will ensure good visibility. The closure of the access channel should be no more than a minor inconvenience for the small number of vessels wishing to launch at the boat ramp and travel upstream. Any navigation safety concerns regarding dredging can be managed by suitable communication with stakeholders and the public, and/or closure of areas for short periods.

Purpose

The purpose of this report is to provide high level information regarding potential navigation safety implications that could arise from Te Pūwaha – Whanganui Port redevelopment. The proposed redevelopment includes rebuilding two wharves and constructing an area for a travel lift and associated hard stand area ashore. In addition, there will be other redevelopment and new buildings constructed ashore (by Q West), including the removal of old piles. A large area of reclamation is also proposed to create public open space. Dredging work will also likely be required for the redevelopment. This report focuses on navigation safety in the Port Basin area as vessel traffic in areas further downstream or upstream is not expected to be appreciably affected by the redevelopment.

Overview

Navigation Safety

Navigation safety refers to the safety of a vessel or vessels interacting with: another vessel or vessels; the seabed; a structure; a natural object, such as rock or the foreshore; environmental conditions, such as currents, winds and waves or any combination of the above. As such, as soon as one vessel is operating in an area, there will be navigation safety issues. Navigation safety issues may be minimized or reduced to an acceptable level but cannot be completely resolved if vessels are operating in an area. Navigational Safety Management is the system of criteria, standards and competence that maintain the ability of a vessel or craft to navigate safely in confined waters such as are found in harbour areas.

Whanganui Port

Overview

The port at Whanganui is located at the mouth of the Whanganui River. Port facilities include berths for small coastal trading vessels, fishing/charter and recreational vessels. There is a recreational boat ramp and trailer park operating in the Port area.

Access to the port is over a bar, and the entrance to the river is delineated by moles to the north and south. Several aids to navigation (lights, buoys and beacons) are in place to aid safe navigation in the area. These aids include a main set of lit lead marks and a secondary unlit set of leads, a navigation light (checkerboard light) and some small navigation buoys upstream of the port area.

According to the latest chart, the charted depth in the channel and alongside the cargo wharf is currently 4.9–6.1 m (Figure 1). The controlling factor for the size of vessels able to visit the port is reported to be the bar at the entrance. Currently, vessels with a draught of up to 4.2 m may enter or depart near high water[1].

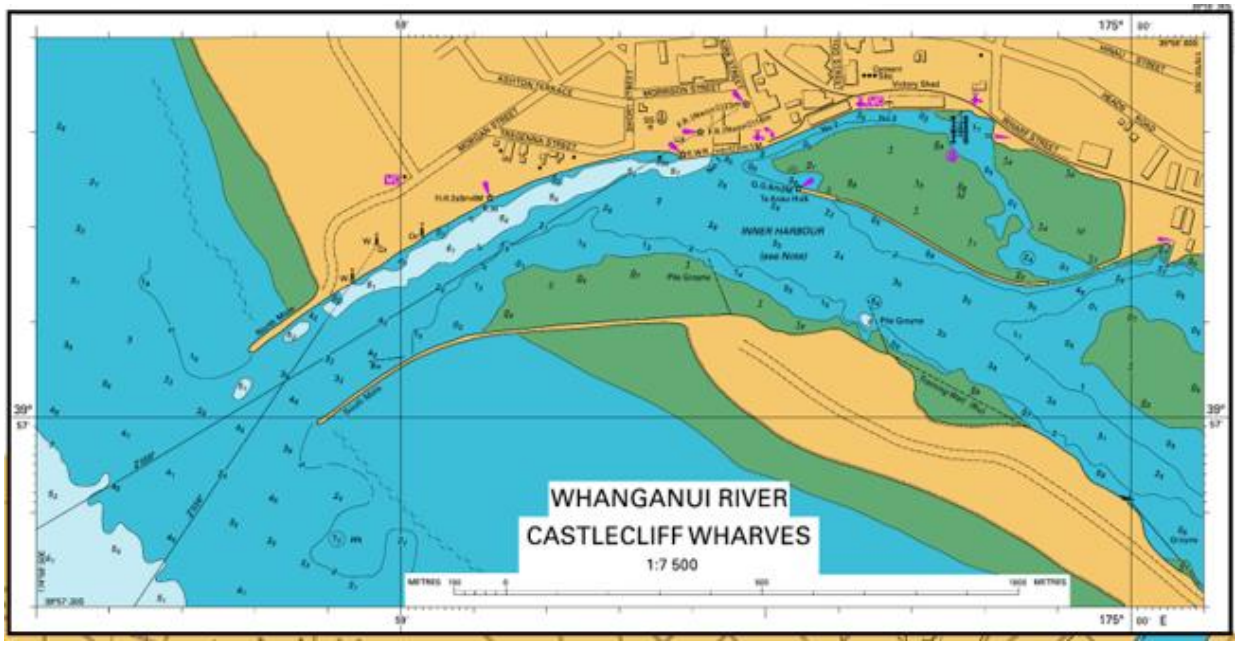

Figure 1. Excerpt from chart NZ 4541 Whanganui River Castlecliff Wharves.

[1]Draught of the 'Anatoki'.

Figure 2. Aerial view of Whanganui Port.

Shipping and vessel use

Local vessels navigate to and from the port regularly. These vessels tend to be fishing/charter and recreational vessels up to 20 m in length or less with a draught of up to 2.0 m. Q-West boat builders construct and refit vessels up to 40 m and these vessels may also navigate in the port area.

A boat launching ramp is situated in the eastern area of the port. This ramp provides launching facilities for trailer vessels. The launching ramp is reported to be regularly used during the summer months by vessels heading out fishing.

The only cargo vessel regularly visiting the port is the ‘Anatoki’. The ‘Anatoki’ is a general bulk cargo vessel: length overall 51 m; maximum laden draught 4.20 m; gross tonnage 561 t. The ‘Anatoki’ has used the port for shipping dolomite, logs, urea and barley.

Figure 3. M.V. Anatoki approaching Castlecliff Wharf.

Te Pūwaha – Whanganui Port redevelopment

The proposed redevelopment includes rebuilding two wharves (Wharves Nos. 2 and 3) and constructing an area for a travel lift and associated hard stand area ashore (see Figure 4). The main change to the existing footprint of the wharves will be the area associated with the travel lift (area 11 in Figure 4). In addition, there will be other redevelopment and new buildings constructed ashore. The old piles (see Figure 2) near the boat ramp will be removed.

Dredging work will likely also be required for the redevelopment, including dredging the Port Basin and at the entrance between the moles. An area of reclamation may be developed at the eastern end of the basin to create public open space. Currently there is an access channel (the wall opening channel in Figure 5) that is open between the river and the Port Basin. This gap will likely be closed in the proposed redevelopment.

Figure 4. Indication of proposed redevelopment showing area of reclamation and closure of old channel.

Figure 5. Whanganui Port showing wall opening channel.

Navigation Safety

Effect of the redevelopment on vessel traffic numbers

In general, the redevelopment is designed to revitalise the existing infrastructure to improve the available facilities. The area of wharf available to berth boats will not be increased and may even be slightly decreased because of the loss of space used to provide the travel lift. Thus, there will be a minimal effect of the redevelopment on the numbers and types of vessels berthing at the wharves.

The presence of the new travel lift may slightly increase the number of vessels using the Port Basin area. The main vessels using the travel lift will be boats associated with Q-West boat builders, either new builds or boats being hauled out for a refit. Q-West currently use a slipway located upstream of the Port Basin and it is likely that any boats travelling to or from this location currently by-pass the Port Basin. After the redevelopment, the Q-West facilities will be located in the Port Basin and vessels will navigate in the area of the basin to access the new travel lift. However, the number of these vessel movements is likely to be low.

The boat ramp used by recreational boat users will have some minor maintenance undertaken in the redevelopment. It is possible that the improved facilities will result in a slight increase in the volume of vessel traffic using the ramp. However, the overall effect of the redevelopment should improve useability and safety of the boat ramp and it is not expected that there will be an appreciable increase in vessel traffic.

Overall, the redevelopment will have a minimal effect on the types and numbers of vessels using the Whanganui River outside of the Port Basin area. In general, the vessel movements upstream and downstream of the wharves will be unaffected by the redevelopment of the port area and thus, navigation safety in the area of the bar and the entrance to the moles, and the river upstream, will be unchanged and will not be further discussed in this report.

Effect of the refurbished wharves and travel lift

The redevelopment of Wharves Nos. 2 and 3 (see Figure 6) will not appreciably alter the original footprint of the wharves, except at the junction where the travel lift will be positioned (see below). As described above, the numbers and types of vessels berthing at these wharves will not change appreciably. Therefore, the redevelopment of these wharves will not affect the navigation safety of vessels using the wharves.

The infrastructure for the bay for the travel lift is positioned within a dogleg of the wharf face and will project further out into the channel than the face of the current wharf (see Figure 6). The projection appears to extend approximately 14 m perpendicular from Wharf No. 2. An area of Wharf No. 2 will need to be kept clear to allow vessels to approach the travel lift bay, possibly by restricting the use of this area for vessels using the travel lift.

Vessels transiting to and from the boat ramp will normally transit the area directly between the ramp and port entrance and should remain clear of the slight obstruction caused by the travel lift bay (see Figure 6). Dredging will likely involve dredging out to 25–30 m from the wharves,[2] which leaves a deeper channel of >15 m in width near the wharves after the redevelopment. Thus, vessels using the boat ramp will also have a larger area of deep water available to manoeuvre in as these vessels pass the area of the travel lift.

In daylight this structure will be clearly visible and should be easy to avoid and will not present an appreciable navigational safety hazard as there should be sufficient room for most vessels

[2] Te Puwaha Dredging and Disposal Volumes (26 Aug 21).

to manoeuvre around the travel lift infrastructure. In addition, vessels will be travelling at speeds ≤ 5 knots so should have sufficient time to avoid other boats navigating in the vicinity.

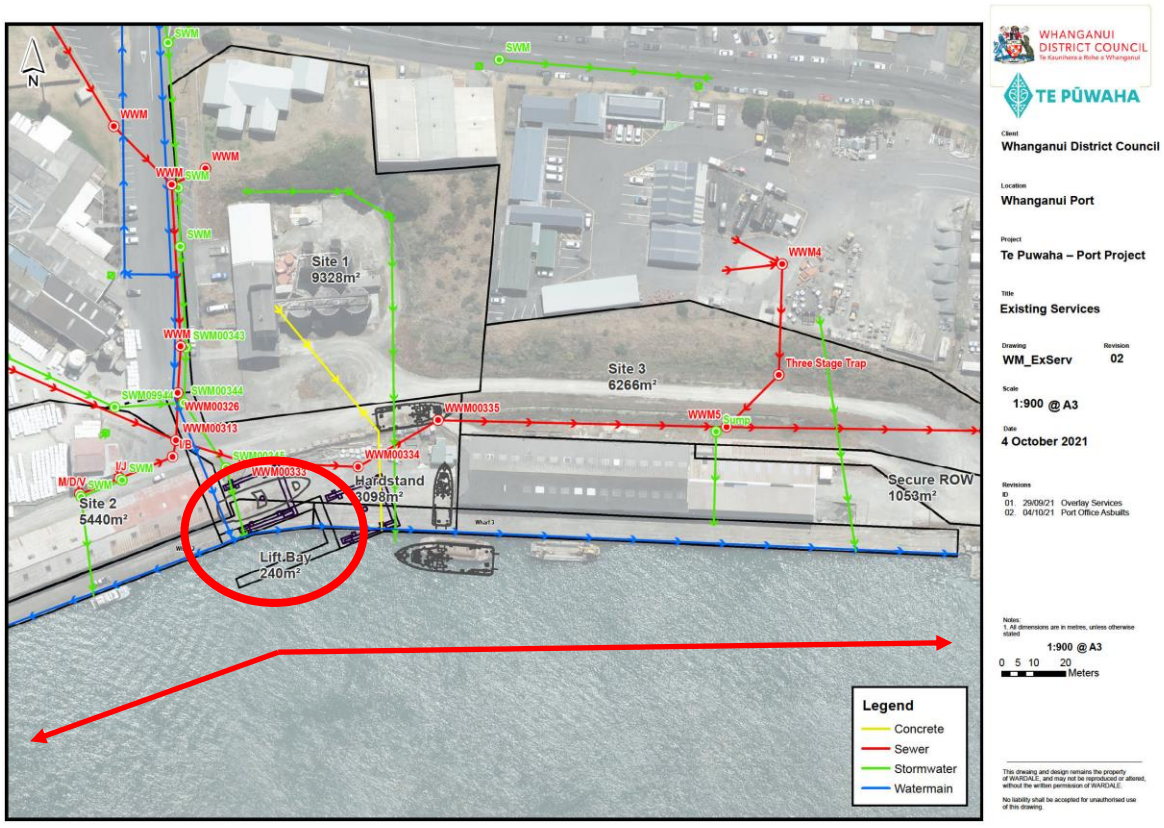

Figure 6. Proposed redevelopment of the wharves showing the location of the travel lift bay (red circle), the red line indicates the likely route of a vessel travelling to or from the boat ramp.

If two vessels that may use Wharf No. 3 were to wish to pass the point where the travel lift will be situated while going in opposite directions at the same time, there may in this situation be insufficient room for both vessels to safely manoeuvre past the travel lift. This situation would not be expected to occur often and can be managed by appropriate communication between the vessel masters and the Port Authority to ensure that two vessels do not arrive at this point at the same time (e.g., one vessel may delay entering the Harbour until the other has departed). Such communication should be occurring anyway as the manoeuvring space here is not appreciably less than at other points along the wharves, particularly if a ship was moored alongside Wharf No. 2.

Consideration should be given to marking the projecting corner of the travel lift so that it is easily visible. This marking may be achieved by painting the structure a colour that contrasts with the surrounding material (e.g., white on a concrete structure). Retroreflective material may be useful to increase the visibility at night. Such contrasting marking is likely to be sufficient to ensure the projecting corner is obvious to vessel traffic, as this traffic will be moving slowly (≤ 5 knots) and will already have to avoid vessels berthed alongside the wharves. The use of floodlighting from buildings ashore would further enhance the visibility of the structure if this was deemed necessary.

Overall, the changes to the wharves and the construction of the travel lift bay will not appreciably affect navigation safety in the area as there appears to be sufficient space for

vessels using the area to manoeuvre around the new structures. Promulgation of information regarding the construction of these new structures will assist in making users aware of the changes and the possible need to avoid the area close to the previous junction of Wharves Nos. 2 and 3. Such information can be made available through the usual methods, including Notices to Mariners, suitable signage at the boat ramp, and through user groups, such as the NZ Coastguard and fishing clubs.

Effect of closing the wall opening and the reclamation

Currently, the Port Basin is created by enclosing the area with a stretch of training wall with two entrances as shown in Figure 7. The upstream (SE) gap is reportedly to allow current to flow through the area adjacent to the wharves to prevent the deposition of silt from the river and to scour out deposited silt. This entrance may currently be used by shallow-draught vessels transiting to and from the wharves to areas upstream, although it appears unlikely that many vessels would be regularly using this route as most vessels using the wharves will transit between the wharves and the open sea. Similarly, most recreational craft using the boat ramp will be heading out to sea rather than upstream.

In the redevelopment as shown in Figure 4, the upstream entrance (SE) will be closed with reclamation of the space to create a recreational area. The gap will essentially be replaced by land so should present no navigation safety hazard to a prudent mariner. The total area of the Port Basin will be reduced after the reclamation, but if the proposed recreational dredging goes ahead, then the amount of usable water at all tides should be increased. In addition, the old piles near the boat ramp will be removed, which will also provide a clearer area for boats to manoeuvre in immediately after launching or prior to retrieval.

Vessels transiting between the wharves, or boat ramp, and areas upstream will have to travel an extra distance once upstream entrance is closed. This is likely to involve extra travel time at 5 knots of approximately 5 min[3] so should be no more than a minor inconvenience to the small number of vessels travelling this route.

Information regarding the changes should be made available through the usual methods, including Notices to Mariners, suitable signage at the boat ramp, and through user groups, such as the NZ Coastguard and fishing clubs. Noting that there are other boat ramps available for those vessels heading up stream.

[3] Calculated from speed over ground, the effect of currents and/or wind may affect this time.

Figure 7. Whanganui Port area showing the upstream (SE) entrance (circled).

Effect on currents

The closure of the gap will be likely to reduce water flow in the basin and thus, have an effect on the deposition of silt in the area and this is discussed under Dredging below. Note that this discussion is confined to matters affecting navigation safety.

Aids to navigation required

Currently, there are two aids to navigation in the Port Basin. A light is situated on a wharf pile at the eastern end of Wharf 1 [2 F WR(vert)] and another light on the Te Anau hulk (Q G), see Figure 1. Other aids are present that are used to transit the bar and downstream of the port but a discussion of these is outside the scope of this report.

Currently, the channel alongside the wharves is not marked by any aids to navigation (other than the wharves themselves on one side). This situation appears to be sufficient for the numbers and types of vessel traffic that use the Port Basin area at present. Should the operational patterns of the port change, e.g., if bigger vessels start regularly visiting the port, consideration may be given to marking this channel.

Consultation with local user groups, such as the commercial boat operators, Coastguard and fishing clubs should be undertaken to determine if the current aids are appropriate. Ongoing consultation with these groups should be undertaken to ensure the aids remain sufficient to ensure navigation safety as a result of any future changes in the use of the area.

Any new aids to navigation would require approval from Maritime New Zealand and the regional Harbourmaster.

Dredging

Current situation

Currently, the flow of water through the wall opening and channel is reported to scour silt from the port wharves area. However, silt does build up over time. Occasional silt build-up is reported to occur around the boat ramp area and at the knuckle of Wharves Nos.1 and 2 in

particular. Dredging in the port has been previously undertaken using a long reach excavator operating from a barge or from the wharf area (Figure 8). In this method, silt is dug from the seafloor and released into the river flow.

The depth maintained in the channel and alongside Wharf No. 1 is reported to be approximately 4.5–6.1 m at chart datum (CD). The ‘Anatoki’ is likely to be the vessel with the largest draught that regularly visits Whanganui. The ‘Anatoki’ has a maximum laden draught of 4.2 m. Thus, a depth of 4.5–6.1 m appears reasonable for the channel and alongside Wharf No. 1 in Whanganui. Alongside Wharves Nos. 2 and 3, the depth is charted as 0.2–3.0 m (at CD).

Figure 8. The depth to which an area is dredged has been previously gauged by a painted scale on the arm of an excavator operated from a barge or wharf.

Te Pūwaha – Whanganui Port redevelopment

The proposed redevelopment will likely involve some initial catch-up maintenance dredging and reclamation. Initially the dredge spoil will be used for the reclamation. Figure 9 shows three areas of potential dredging in the Port Basin: the Priority Dredged Area (immediately alongside the wharves); the Future Dredged Area (an extended area out from the wharves) and the Proposed Recreational Dredged Area (encompassing the entire basin post closure of the gap and reclamation of an area in the east of the basin). These three areas are discussed

below. In addition, consultation with local user groups, such as Q-West, the commercial boat operators, Coastguard and fishing clubs should be considered to determine what depths may be appropriate at each of the locations.

Priority Dredged Area

To provide adequate water for vessels to remain afloat at all states of tide, the wharf area will need to be dredged to at least the current minimum charted depth of 4.5 m at CD and will need to be maintained at this depth up to and alongside Wharf No. 1 to allow the safe use of vessels such as the 'Anatoki', which has a draught of 4.2 m. The planned minimum depth at Wharf No. 1 is 4.5 m and the maximum is 5.0 m (Figure 9),[2] which should be adequate for vessels up to the size of the "Anatoki".

The vessels reported to currently use Wharves Nos. 2 and 3, and the types of vessels likely to use the travel lift, have draughts ≤ 2 m, so it would appear sensible to dredge alongside these wharves to a depth of at least ≥ 2.2 m (CD) to provide a suitable under-keel clearance for vessels with draughts up to 2 m. The proposed minimum depth alongside Wharves Nos. 2 and 3 is 2.5 m (Figure 9), which appears adequate for the intended use of these wharves. The maximum planned depth is 4.5 m.[2]

Future Dredged Area

Currently, the area alongside the wharves between the dredged channel next to the wharves and a line between the Te Anau hulk and the boat ramp appears to mostly dry at CD, except for an area near the hulk and an area near to the boat ramp where old pile moorings are shown in Figure 2. If this area was dredged, it would provide greater manoeuvring room for vessels using Wharves Nos. 2 and 3 and the travel lift facility and for vessels transiting from the boat ramp and the open sea. For this area to be useful for vessels using the wharves and travel lift, dredging to a depth of ≥ 2.2 m would be desirable. The planned depth for this area is a minimum of 2.5 m and a maximum of 3.5 m.[2]

Recreational Dredged Area

If the operation of the port remains unchanged, i.e., the size of vessels visiting the port does not increase, there would appear to be no navigation safety reasons to further dredge any areas other than those discussed above. The remaining area of the basin is only used by small recreational craft, such as row boats, dinghies and kayaks, and possibly small recreational craft accessing the boat ramp at high tide. Currently, a large part of this area dries at CD. Dredging this area would provide extra space for recreational craft to use and could provide an asset for the community. However, if initially dredged, there may be an expectation that the new depth will be maintained. The planned depth for this area is a minimum of 1.5 m and a maximum of 2.5 m.[2]

[2] Te Puwaha Dredging and Disposal Volumes (26 Aug 21).

Figure 9. Possible proposed areas of dredging.

Methods of dredging

In the development or redevelopment of a marine area, such as a harbour or marina, dredging may be required to achieve the required depth of water for vessels to safely navigate in the area. Dredging has occurred historically in Whanganui and some catch-up maintenance dredging will be required during the redevelopment. Depending on the location, further maintenance of the depth may be required to remove sediment that has re-accumulated over time. This maintenance may be achieved by a dredging programme or re-mobilisation of the sediment.

Catch-up maintenance dredging

Catch-up maintenance dredging may be initially undertaken as part of the redevelopment with the spoil intended to be used for reclamation in the Port Basin and also used in other areas (see Figure 9). Additional spoil may be discharged into the river outside of the basin and/or disposed of out at sea. The type of dredging used here will depend on financial considerations and the time frame allocated for the completion of the dredging. I would assume that a commercial dredger will be brought in to undertake the initial dredging. Such dredgers in use in New Zealand include the 'New Era' a 58-m trailing suction hopper dredger (split hull) and the 'Kawatiri', a 55-m trailing suction and grab dredger. The spoil from the dredging may be transported by the dredger to sites at sea or by pipeline to sites ashore or for reclamation.

Navigation safety during the catch-up maintenance dredging

Any navigation safety concerns regarding the use of a vessel for dredging in the port area can be managed by suitable communication of the dredging operations, including direct communication with the larger vessels that visit the port, Notices to Mariners and signage at the boat ramp. If the operations are such that the navigation safety in the area will be significantly affected, such as the situation where the dredger is working in a restricted space alongside the wharf, the area may need to be closed to all vessels for a time. This situation can also be safely managed with appropriate signage and communications.

If the spoil is transported using a pipeline rather than directly by the dredger, then any navigation safety concerns regarding the presence of the pipeline will need to be addressed. The pipeline must not be placed so that it prevents vessels from being able to safely navigate (e.g., perpendicular to the channel alongside the wharves). If the pipeline is required to cross such areas then vessel movements would need to cease or it would need to be positioned on the seabed and a no anchoring zone established in the area if anchoring is not already prohibited. In some cases, a pipeline may be able to be led under the wharves, or along the breakwater, to prevent any navigation safety conflicts. In areas of low traffic volume, with suitable options for avoidance, it may be possible to position the pipeline on the surface of the water. In this case, the pipeline must be well marked so the obstruction is obvious to the masters of vessels in the area, and its presence promulgated by suitable communications and signage.

Overall dredging takes place in many ports and any navigation safety issues are managed by notifications, awareness and good practice during the operations.

Ongoing depth maintenance

After the catch-up maintenance dredging for the redevelopment, ongoing maintenance of the desired depths of water is likely to be needed. Over time the sediment from the river will build up again and require removal. The rate at which the sediment accumulates after the redevelopment should be monitored to determine the most suitable method to maintain the

depths required for navigation safety. The ongoing depth maintenance will likely be managed using a variety of techniques.

Sediment re-mobilisation at Whanganui has been previously undertaken using a long reach excavator operating from a barge or from the wharf area. In this method, sediment is dug from the seafloor and released into the river flow. This use of natural dispersion for the sediment at the site is unusual in New Zealand but appears to have been effective at Whanganui. This method has a considerable advantage in that there is no costly disposal of dredged material.

This system using a barge and excavator with release of sediment into the river may be all that is required for ongoing sediment re-mobilisation. The sediment that is being removed is material that has been swept downstream by the river so there may be no environmental concerns with this method.

Another option may be to periodically bring in a dredger to undertake sediment re-mobilisation. The sediment could either be dispersed into the river or if the amounts concerned made this impractical, then the sediment would need to be disposed of out at sea. Potentially a pipeline could be constructed to transfer the sediment from the harbour to a site within the river flow, on land or at sea.

Any navigation safety concerns with ongoing sediment re-mobilisation will depend on the type of method used and will in general be the same as discussed for the catch-up maintenance dredging. As such, navigation safety should be able to be managed by appropriate notifications, awareness and good practice during the operations.

Conclusions and recommendations

- Te Pūwaha –Port Project improves navigation safety by providing ‘fit for purpose’ facilities in a planned and integrated format.
- The proposal creates no boating activities that are not managed by current maritime rules.
- The projecting edge of the travel lift should be marked to ensure good visibility
- Depth maintenance may need to be undertaken and the appropriate method for this will depend on the new sediment deposition rate.
- Navigation safety during the dredging operations can be managed with appropriate standard methods, including promulgation of information and/or closure of the area for short periods
- The dredging plan has been consulted and should continue to be reviewed with user groups and partners to accommodate future vessel use of the area.