# Appendix C –
# Evaluation of Alternative Solutions

| Category / Criteria | Indicator(s) | Alternative 1:<br>Raising the North and East Docks | Alternative 2:<br>Reconstruction of the Wharf | Alternative 4:<br>Do Nothing |
|---|---|---|---|---|
| **Natural Environment** | | | | |
| Effect on Aquatic Habitat | Temporary effects on aquatic species (including species at risk) and habitat quality during construction | • Potential for timber, rock fill and other construction and demolition debris spikes to be spilled into water during wharf removal and construction, potentially covering existing habitat.<br>• During demolition and construction activities, potential for disturbed soil particles to be suspended in the water column, resulting in increased turbidity and relocation and deposition of soil particles that could impact fish and fish habitat.<br>• This could potentially be mitigated using a turbidity curtain to enclose the area during and immediately after work periods, and by ensuring all waste materials are contained, collected and removed off-site for disposal.<br>• The types of potential effects for Alternatives 1 and 2 are similar. While Alternative 1 will cover a slightly smaller area than Alternative 2, the difference in area coverage is not significant.<br>• The potential impacts to aquatic habitat during demolition and construction are anticipated to be minor and temporary. Long term impacts are anticipated to be negligible compared to existing conditions.<br>**Moderately Preferred** | • Potential for timber, rock fill and other construction and demolition debris spikes to be spilled into water during wharf removal and construction, potentially covering existing habitat.<br>• During demolition and construction activities, potential for disturbed soil particles to be suspended in the water column, resulting in increased turbidity and relocation and deposition of soil particles that could impact fish and fish habitat.<br>• This could potentially be mitigated using a turbidity curtain to enclose the area during and immediately after work periods, and by ensuring all waste materials are contained, collected and removed off-site for disposal.<br>• The types of potential effects for Alternatives 1 and 2 are similar. While Alternative 1 will cover a slightly smaller area than Alternative 2, the difference in area coverage is not significant.<br>• The potential impacts to aquatic habitat during demolition and construction are anticipated to be minor and temporary. Long term impacts are anticipated to be negligible compared to existing conditions.<br>**Moderately Preferred** | • There would be no construction impacts on the aquatic habitat in a “do nothing” scenario.<br>**Most Preferred** |
| | Permanent effects on aquatic species (including species at risk) and habitat quality | • No long-term impacts from construction activities are anticipated.<br>• The removal of the existing timber cribs and replacement with steel piles, steel sheet pile walls and floating docks will result in the net gain of available channel floor surface, providing additional aquatic habitat.<br>• No existing aquatic habitat vegetation will be covered by the proposed work.<br>**Most Preferred** | • No long-term impacts from construction activities are anticipated.<br>• The removal of the existing timber cribs and replacement with steel piles, steel sheet pile walls and floating docks will result in the net gain of available channel floor surface, providing additional aquatic habitat.<br>• No existing aquatic habitat vegetation will be covered by the proposed work.<br>**Most Preferred** | • There would be no change in aquatic habitat conditions in a “do nothing” scenario. Therefore, there would be no net gain of available channel floor surface to provide additional aquatic habitat.<br>**Moderately Preferred** |

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| Effect on Terrestrial Habitat | Temporary effects on terrestrial habitat quality and species (including species at risk) during construction | • The wharf area does not contain any natural terrestrial habitat.<br>• Barn swallows have been identified as nesting on the site in and around the wharf area. There is the potential for some disturbance of nesting sites during construction. However, these can be mitigated either through completing the construction outside of the nesting timing window (May to August 31st) or, if not, putting measures in place to protect nesting birds, such as making sure the birds do not nest and monitor existing nests if being used.<br>**Moderately Preferred** | • The wharf area does not contain any natural terrestrial habitat.<br>• Barn swallows have been identified as nesting on the site in and around the wharf area. There is the potential for some disturbance of nesting sites during construction. However, these can be mitigated either through completing the construction outside of the nesting timing window (May to August 31st) or, if not, putting measures in place to protect nesting birds, such as making sure the birds do not nest and monitor existing nests if being used.<br>**Moderately Preferred** | • There would be no temporary impacts on terrestrial habitat quality and species (including species at risk) in a “do nothing” scenario.<br>**Most Preferred** |
| | Permanent effects on terrestrial habitat quality and species (including species at risk) | • Nesting under the dock will no longer be available due to the steel sheet pile sea walls.<br>• Nesting will continue to be available under the new concrete wharf.<br>**Moderately Preferred** | • Nesting under the dock will no longer be available due to the steel sheet pile sea walls.<br>• Nesting will continue to be available under the new concrete wharf.<br>**Moderately Preferred** | • There would be no permanent impacts on terrestrial habitat quality and species (including species at risk) in a “do nothing” scenario.<br>**Most Preferred** |
| Source Water Protection | Impacts to drinking water supply from during or after construction | • Construction debris, spills, sediments or turbidity could potentially drift toward and be drawn into the community’s drinking water intake, depending on the direction of the currents, wind direction, and/or wave action.<br>**Least Preferred** | • Construction debris, spills, sediments or turbidity could potentially drift toward and be drawn into the community’s drinking water intake, depending on the direction of the currents, wind direction, and/or wave action.<br>**Least Preferred** | • No impacts to the drinking water supply are anticipated in a “do nothing” scenario.<br>**Most Preferred** |
| ***Natural Environment Summary*** | | • Given the nature of the permanent and temporary disturbances to aquatic and terrestrial/avian habitats by and near the wharf and potential risk to drinking water supply, the overall anticipated impact to the natural environment is low for both Alternatives 1 and 2.<br>**Moderately Preferred** | • Given the nature of the permanent and temporary disturbances to aquatic and terrestrial/avian habitats by and near the wharf and potential risk to drinking water supply, the overall anticipated impact to the natural environment is low for both Alternatives 1 and 2.<br>**Moderately Preferred** | • There would be no temporary or permanent impacts to aquatic and terrestrial/avian habitats or the drinking water supply in the Do-Nothing alternatives.<br>**Most Preferred** |

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| **Social Environment** | | | | |
| Effect on Area Users<br>(including both positive and negative effects) | Type and magnitude of effects during construction | • Construction of the wharf will result in its unavailability for use by the community for approximately 20-25 weeks.<br>• Noise would be expected from driving in the sheet pile wall. The duration of this noise would be less than Alternative 2.<br>• Noise and dust are anticipated from the construction activities. The duration of this disturbance would be less than Alternative 2.<br>**Moderately Preferred** | • Construction of the wharf will result in its unavailability for use by the community for approximately 35-40 weeks.<br>• Noise would be expected from driving in the sheet pile wall. The duration of this noise would be longer than Alternative 1.<br>• Noise and dust are anticipated from the construction activities. The duration of this disturbance would be longer than Alternative 1.<br>**Least Preferred** | • There would be no disturbance from construction activities.<br>**Most Preferred** |
| | Type and magnitude of effects after construction | • While this option would raise the wharf slightly above the highest recorded water level, it may still be susceptible to wave action, with water washing over the deck surface in high-wind conditions. This would cause temporary disruptions of wharf use.<br>• As the south docks would remain as is, their age makes it likely that repairs or replacement will be required on the existing wood and concrete structures in the next decade. These works would interrupt wharf use for another season.<br>**Moderately Preferred** | • Raising the entire dock above record high levels will best ensure the wharf is least impacted by water levels and wave action.<br>• This alternative will renew the service life of the wharf, avoiding the requirement for a second future closure to complete repairs or replacement of the south docks.<br>**Most Preferred** | • Superficial repairs to localized sink holes and erosion would not address the structural issues that relate to the crib's ability to retain fill. As such, fill will continue escaping, creating new sink holes. In addition, the future high-water levels would continue to impact the wharf's ability to function and increase structural damage. This would likely create disruptions to service and create potential safety hazards.<br>• High-water levels would increase the potential for the existing lightweight fill being pushed up to the wharf surface, causing excessive damages and requiring the continued use unsightly concrete barriers as counterweights.<br>• Postponing reconstruction would result in the continued degradation of the wharf's structural integrity, where it could become a risk to public safety.<br>**Least Preferred** |
| Recreational Boating | Ability to accommodate recreational boating | • Both alternatives 1 and 2 would have similar potential to accommodate recreational boating.<br>• Both alternatives 1 and 2 would have increased potential to accommodate recreational boating compared to the existing wharf.<br>**Most Preferred** | • Both alternatives 1 and 2 would have similar potential to accommodate recreational boating.<br>• Both alternatives 1 and 2 would have increased potential to accommodate recreational boating compared to the existing wharf.<br>**Most Preferred** | • The existing wharf would have less potential to accommodate recreational boating compared to the alternatives 1 and 2.<br>**Least Preferred** |
| ***Social Environment Summary*** | | • While the anticipated construction disruptions would be shorter than Alternative 2, there would still be the potential future disruptions due to high-water level closures and future repair/replacement works.<br>• Both alternatives 1 and 2 would have increased potential to accommodate recreational boating compared to the existing wharf.<br>**Moderately Preferred** | • While the anticipated construction disruptions would be longer than Alternative 1, it would lesson potential future disruptions due to high-water level closures and future repair/replacement works.<br>• Both alternatives 1 and 2 would have increased potential to accommodate recreational boating compared to the existing wharf.<br>**Most Preferred** | • The lack of structural repairs and wharf improvements increases the likelihood of service disruptions and closures at the wharf.<br>• The existing wharf would have less potential to accommodate recreational boating compared to the alternatives 1 and 2.<br>**Least Preferred** |

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| **Cultural Environment** | | | | |
| Effect on Archaeological Resources | Loss and/or disturbance of archaeological resources | • A Stage 1 Archaeological Assessment and a Marine archaeological screening indicated that the site does not have any archaeological potential. Therefore, no loss and/or disturbance of archaeological resources is expected.<br>**Most Preferred** | • A Stage 1 Archaeological Assessment and a Marine archaeological screening indicated that the site does not have any archaeological potential. Therefore, no loss and/or disturbance of archaeological resources is expected.<br>**Most Preferred** | • A Stage 1 Archaeological Assessment and a Marine archaeological screening indicated that the site does not have any archaeological potential. Therefore, no loss and/or disturbance of archaeological resources is expected.<br>**Most Preferred** |
| Effect on Cultural Heritage Resources | Loss and/or disturbance of cultural heritage resources | • No loss or disturbance of cultural heritage resources is anticipated.<br>**Most Preferred** | • No loss or disturbance of cultural heritage resources is anticipated.<br>**Most Preferred** | • No loss or disturbance of cultural heritage resources is anticipated.<br>**Most Preferred** |
| ***Cultural Environment Summary*** | | • All three alternatives are equally preferred.<br>**Most Preferred** | • All three alternatives are equally preferred.<br>**Most Preferred** | • All three alternatives are equally preferred.<br>**Most Preferred** |
| **Built Environment** | | | | |
| Effect on Wharf and Associated Facilities | Disturbance/improvements to the wharf, docking areas, landing and on-site amenities | • Alternatives 1 and 2 would similarly accommodate and provide flexibility to maximize docking areas, the landing and on-site amenities.<br>**Most Preferred** | • Alternatives 1 and 2 would similarly accommodate and provide flexibility to maximize docking areas, the landing and on-site amenities.<br>**Most Preferred** | • Deteriorating conditions would impact the wharf's ability to function as desired and safely.<br>**Least Preferred** |
| Alignment with Land-use Planning | Implications of alternative for current zoning and designated land uses | • Alternative aligns with existing and zoned land uses<br>**Most Preferred** | • Alternative aligns with existing and zoned land uses<br>**Most Preferred** | • Alternative aligns with existing and zoned land uses<br>**Most Preferred** |
| ***Built Environment Summary*** | | • Alternatives 1 and 2 would be better able to accommodate docking areas and on-site amenities compared to the Do Nothing alternative while aligning with the site's existing defined land uses.<br>**Most Preferred** | • Alternatives 1 and 2 would be better able to accommodate docking areas and on-site amenities compared to the Do Nothing alternative while aligning with the site's existing defined land uses.<br>**Most Preferred** | • The continued deteriorating conditions resulting from the Do Nothing alternative have a negative impact on wharf usage compared to Alternatives 1 and 2. .<br>**Least Preferred** |

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| **Economic Environment** | | | | |
| Effect on Economic Development | Potential benefits and impacts on local businesses and economic opportunities | • The concepts considered in alternatives 1 and 2 would provide similar economic benefits and potential economic opportunities arising from greater community use of the wharf.<br>• However, potential activities established at the wharf would be temporarily disrupted at some point in the future due to future repairs or replacement required on the existing wood and concrete structures.<br>**Moderately Preferred** | • The concepts considered in alternatives 1 and 2 would provide similar economic benefits and potential economic opportunities arising from greater community use of the wharf.<br>• Compared to alternative 1, no future disruptions would be required due to the repairs or replacement required on the existing wood and concrete structures.<br>**Most Preferred** | • Deteriorating conditions would impact the wharf's ability to function as desired and safely.<br>• This would create negative impacts on local businesses and curtail potential for economic opportunities.<br>**Least Preferred** |
| Effect on Municipal Leases | Ability of Municipality to meet terms of municipal wharf leases | • Alternatives 1 and 2 would similarly allow the Municipality to meet terms of municipal wharf leases<br>**Most Preferred** | • Alternatives 1 and 2 would similarly allow the Municipality to meet terms of municipal wharf leases<br>**Most Preferred** | • Deteriorating conditions would impact the wharf's ability to function as desired and safely.<br>• This could potentially impact the Municipality's ability to meet the terms its municipal wharf leases.<br>**Least Preferred** |
| ***Economic Environment Summary*** | | Alternative 1 provides similar economic benefits and opportunities compared to Alternative 2, but these would be disrupted in the future for a second round of repair or replacement works. It also allows the Municipality to meet the terms of the municipal wharf leases.<br>**Moderately Preferred** | Alternative 2 provides similar economic benefits and opportunities compared to Alternative 1, while avoiding the need for disruptions in the future for a second round of repair or replacement works. It also allows the Municipality to meet the terms of the municipal wharf leases.<br>**Most Preferred** | The deteriorating conditions resulting from the Do Nothing alternative degrade the potential for local business activities and economic opportunities. They could also potentially impact the Municipality's ability to meet the terms its municipal wharf leases.<br>**Least Preferred** |

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| **Technical** | | | | |
| Wharf Longevity | Anticipated longevity of alternative solution / anticipated timeline on future wharf upgrades and repairs | • While Alternative 1 will upgrade the wharf and improve the functionality of the north and east docks, the south docks would require repairs or replacement of the existing wood, timber cribs and concrete dock.<br>**Moderately Preferred** | • Alternative 2 will renew the service life of the wharf (approximately 50 to 60 years). This will allow the wharf to operate without significant structural upgrades or refits for the foreseeable future.<br>**Most Preferred** | • The Do Nothing alternative would allow the wharf's deteriorating conditions to continue, impacting the wharf's ability to function as desired and safely in the future.<br>**Least Preferred** |
| Climate Change Adaptation | Resilience of wharf to future climate change impacts, including increased lake levels and severe weather events | • The anchored sheet pile wall would provide greater resiliency to extreme weather events than the site's existing conditions.<br>• While Alternative 1 would raise the north and east docks slightly above the highest recorded water level, it may still be susceptible to wave action, with water washing over the deck surface in high-wind conditions.<br>• The south dock would remain at the same elevation and continue to be vulnerable to flooding during high-water levels.<br>**Moderately Preferred** | • The anchored sheet pile wall would provide greater resiliency to extreme weather events than the site's existing conditions.<br>• Alternative 2 would raise the entire dock above the record high levels to best ensure the wharf is least impacted by water levels and wave action.<br>**Most Preferred** | • The Do Nothing alternative would allow the wharf's continued exposure to and vulnerability against extreme weather events and high-water level conditions. This would allow the wharf's deteriorating conditions to continue, impacting the wharf's ability to function as desired and safely in the future.<br>**Least Preferred** |
| ***Technical Summary*** | | Alternative 1 would be a solution for the short to mid-term, but future wharf upgrades and repairs would be required for the south docks. The wharf under Alternative 1 would also be less resilient to extreme weather events compared to Alternative 2.<br>**Moderately Preferred** | Alternative 2 provides a long-term solution that provides the greatest resilience to future extreme weather events.<br>**Most Preferred** | The Do Nothing alternative negatively impacts the wharf's longevity and is vulnerable to extreme weather events.<br>**Least Preferred** |

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| **Financial** | | | | |
| Capital Costs | Anticipated net capital costs (considering federal grants) | • The anticipated capital cost for Alternative 1 is $943,000 (based on 2020 estimate).<br>• This cost does not include the additional design and mobilization costs for activities related to the anticipated future repairs or replacements required for the south docks, which would likely be more expensive if done separately at a future date. Further, it is not known how much - if any - of these future costs would be offset by provincial or federal grants.<br>**Least Preferred** | • The anticipated capital cost for Alternative 1 is $2,772,000 (based on 2020 estimate).<br>• While this capital cost is greater than Alternative 1, it would avoid the additional design and mobilization costs for activities related to the anticipated future repairs or replacements required for the south docks.<br>**Moderately Preferred** | • There are no capital costs associated with the Do Nothing alternative.<br>**Most Preferred** |
| Operating Costs | Anticipated annual operations and maintenance costs | • The annual operations and maintenance costs for Alternatives 1 and 2 are anticipated to be similar in magnitude.<br>**Most Preferred** | • The annual operations and maintenance costs for Alternatives 1 and 2 are anticipated to be similar in magnitude.<br>**Most Preferred** | • The annual operations and maintenance costs for the Do Nothing alternatives is anticipated to be greater than Alternatives 1 and 2, due to the need for on-going repairs.<br>• As the Do Nothing alternative would allow the wharf's deteriorating conditions to continue, public safety risks and hazards could lead to injuries, including those for which the Municipality may be held liable. This could result in financial implications for the Municipality.<br>**Least Preferred** |
| ***Financial Summary*** | | • Alternative 2 is moderately preferred as it likely will have higher long-term capital costs compared to Alternative 2, but lower operating costs compared to the do-nothing alternative. It also would have lower financial risk to the municipality compared to the do-nothing alternative.<br>**Moderately Preferred** | • Alternative 1 is most preferred as it likely will have lower long-term capital costs compared to Alternative 1 and lower operating costs compared to the do-nothing alternative. It also would have lower financial risk to the municipality compared to the do-nothing alternative.<br>**Most Preferred** | • The Do Nothing alternative is least preferred. While it has the lowest capital cost, the operating costs compared to alternatives 1 and 2 would be higher. It also would have higher financial risk to the municipality due to issues of liability.<br>**Least Preferred** |

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| **Overall Evaluation Summary** | | Alternative 1 is moderately preferred compared to Alternative 2. It is a short to mid-term that, like Alternative 2, will allow the Municipality to continue meeting its obligations under the wharf lease while providing opportunities for increased economic benefits arising from greater community use of the wharf. However, these activities would be disrupted due to the eventual needed repair or replacement of the south dock.<br><br>Alternative 1 also provides less resilience to potential future climate change impacts, including high-water levels and extreme weather events.<br><br>Any potential permanent and temporary disturbances to aquatic and terrestrial/avian habitats by and near the wharf are anticipated to be minor.<br><br>Alternative is likely to higher long-term capital costs compared to Alternative 1, but less financial risk compared to the Do Nothing alternative due to issues of liability. Operating costs for Alternatives 1 and 2 would be similar and less than the Do Nothing alternative.<br><br>**Moderately Preferred** | Alternative 2 is most preferred because it is a long-term solution that allows the Municipality to continue meeting its obligations under the wharf lease while providing opportunities for increased economic benefits arising from greater community use of the wharf. This alternative also avoids the potential future disruptions that would be caused by the eventual needed repair or replacement of the south dock.<br><br>Alternative 2 also provides the greatest resilience to potential future climate change impacts, including high-water levels and extreme weather events.<br><br>Any potential permanent and temporary disturbances to aquatic and terrestrial/avian habitats by and near the wharf are anticipated to be minor.<br><br>Alternative is likely to have the lowest long-term capital costs and less financial risk compared to the Do Nothing alternative due to issues of liability. Operating costs for Alternatives 1 and 2 would be similar and less than the Do Nothing alternative.<br><br>**Most Preferred** | The Do Nothing alternative is least preferred because it provides no extra economic opportunities and does nothing to avoid the continued degradation of the wharf, which could threaten public safety and the Municipality's ability to meet is obligations under the wharf lease.<br><br>The wharf under the Do Nothing alternative continues to be vulnerable to potential future climate change impacts, including high-water levels and extreme weather events.<br>Alternative is likely to have the lowest long-term capital costs and less financial risk compared to the Do Nothing alternative due to issues of liability. Operating costs for Alternatives 1 and 2 would be similar and less than the Do Nothing alternative.<br><br>**Least Preferred** |