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## 10 FISHERIES IMPACT

### 10.1 Introduction

10.1.1 This section presents the baseline fisheries profile within the assessment area, and the assessment on the potential fisheries impacts associated with the construction and operation of the Project. The fisheries impact assessment has been conducted in accordance with the requirement in Annexes 9 and 17 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) and the requirements in Section 3.4.10 and Appendix I of the EIA Study Brief (ESB-363/2023).

### 10.2 Environmental Legislation, Standards and Assessment Criteria

10.2.1 This fisheries impact assessment has made reference to the following ordinances and guidelines to identify the importance of fisheries resources, and assess potential impacts arising from the Project:

- The Environmental Impact Assessment Ordinance (Cap. 499);
- Annexes 9 and 17 of the EIAO-TM; and
- Water Pollution Control Ordinance (Cap. 358).

### 10.3 Assessment Methodology

#### Assessment Area

10.3.1 In accordance with the EIA Study Brief, the assessment area for fisheries impact assessment includes areas within 500 metres distance from the boundary of the proposed development and the associated works of the Project (i.e. the Project Site), and other areas if they are found also being impacted by the construction or operation of the Project. Part of the areas within the Project Site are under other existing/planned projects, i.e. the existing temporary transitional housing development, Northern Link (NOL) Main Line and First Phase Development of the New Territories North – San Tin/Lok Ma Chau Development Node (**Figure 10.1** refers). Thus, these areas have been excluded from this assessment. Special attention has been given to the potential loss or disturbance of fishponds and pond fish culture activities as well as any watercourses which serve as water sources for fishpond areas.

#### Methodology

10.3.2 Literature review and desktop study were conducted to collate the latest baseline conditions regarding culture fisheries resources within the assessment area. A list of available literature is provided in **Table 10.1** below.

**Table 10.1 List of Relevant Literature**

No.	Relevant Literature
1.	Aquaculture Data from Agriculture, Fisheries and Conservation Department (AFCD) website (AFCD, 2024b <sup>[11]</sup> )
2.	Accredited Fish Farm Scheme – Registered Fish Farms (AFCD, 2024c <sup>[12]</sup> )
3.	AFCD Departmental Annual Reports 2013-2023 (AFCD, 2015 <sup>[1]</sup> , 2016 <sup>[2]</sup> , 2017 <sup>[3]</sup> , 2018 <sup>[4]</sup> , 2019 <sup>[5]</sup> , 2020 <sup>[6]</sup> , 2021 <sup>[7]</sup> , 2022 <sup>[8]</sup> , 2023 <sup>[9]</sup> , 2024a <sup>[10]</sup> )

No.	Relevant Literature
4.	EIA Report for Ngau Tam Mei Water Treatment Works Extension (Register No.: AEIAR-262/2024) (WSD, 2024 <sup>[18]</sup> )
5.	EIA Report for STL MC DN (Register No.: AEIAR-261/2024) (CEDD, 2024 <sup>[15]</sup> )
6.	EIA Report for Northern Link (Register No.: AEIAR-259/2024) (MTR Corporation Limited, 2023 <sup>[17]</sup> )
7.	EIA Report for Proposed Low-rise and Low-density Residential Development at Various Lots and their Adjoining Government Land in D.D. 104, East of Kam Pok Road, Mai Po, Yuen Long, New Territories (Register No.: AEIAR-205/2017) (Glory Queen Limited, 2016 <sup>[16]</sup> )
8.	EIA Report for Comprehensive Development and Wetland Protection near Yau Mei San Tsuen (Register No.: AEIAR-189/2015) (Asia King Development Limited, 2015 <sup>[13]</sup> )
9.	EIA Report for Proposed Residential Cum Passive Recreation Development within "Recreation" Zone and "Residential (Group C)" Zone at Various Lots in DD 104, Yuen Long, N.T. (Register No.: AEIAR-182/2014) (Capital Chance Ltd, 2013 <sup>[14]</sup> )
10.	Recent aerial photos

- 10.3.3 In addition to the literature review with recent aerial photographs, site visits were also undertaken between January 2022 and June 2024 for the verification of the fishponds and associated fisheries activities, with particular focus on those within the Project Site, where accessible. The conditions of the fishponds and the fisheries activities were observed and recorded. Drone photos were taken to facilitate the assessment for inaccessible fishponds within the assessment area. Observation was made on the presence of any aquaculture practice and activities (e.g. draining, liming, re-profiling, stocking, feeding and harvesting), evidence of any recently used devices/equipment and sign of vegetation management.

#### Assessment for Pond Culture Fisheries

- 10.3.4 Concreted ornamental ponds and ponds utilised for non-fisheries related activities (e.g. for wetland compensation or flood storage) were not considered as fishponds. Based on the findings of site visits, fishponds have been categorised as follows:
- Active: with evidence of operating commercial aquaculture activities, including commercial fishponds, fish fry ponds and indoor fish farms;
  - Inactive: with no evidence of operating commercial aquaculture activities, but no major physical constraints to the resumption of operation in the short-term, including ponds with fish present in non-commercial quantities and ponds for recreational fishing;
  - Abandoned: with physical evidence that aquaculture has not been taken place for many years (i.e. overgrown with vegetation) and/or where there are obvious physical constraints to the resumption of fisheries activity in short-term (e.g. ponds which are fenced off and thus inaccessible); and
  - Others: ponds that are unrelated to commercial aquaculture activities, including ponds created for wetland compensation, ecological enhancement or flood storage ponds, etc., and were scoped out from further assessment.

- 10.3.5 The status of fishpond management was investigated with reference made to the evidence of aquaculture activities, such as the presence of fishing operation (e.g. stocking, feeding, harvesting), management activities (e.g. pumping of water, draining, dredging, re-profiling and maintenance grass trimming), and the presence of any associated equipment (e.g. aerators, conditions of pond bund and fodder) and their conditions. Attention was also given to any watercourses which potentially serve as water sources for fishponds.

#### 10.4 Fisheries Baseline Condition

##### Description of the Environment and Baseline Condition

##### *Aquaculture (Pond Fish Culture)*

- 10.4.1 Fishponds were mainly identified at the east near the Ngau Tam Mei Water Treatment Works (NTMWTW) and southeast of the assessment area. Some scattered fishponds were recorded along both sides of Ngau Tam Mei Drainage Channel (NTMDC). Clusters of fishponds were also identified to the west of San Tin Highway, mainly near Yau Mei San Tsuen and southwest near Man Yuen Chuen. Pond fish culture of various statuses were identified, including active, inactive and abandoned fishponds (**Figures 10.1.1 to 10.1.4** refer).

##### *Other Fisheries Resources*

- 10.4.2 No other fisheries resources such as capture fisheries or other aquaculture (e.g. Fish Culture Zones or oyster culture) were recorded within the assessment area. Considering the absence of these other fisheries resources, potential impacts on these resources are not anticipated. Detailed information on these resources were scoped out from this chapter.

##### Pond Fish Culture Activities and Resources

##### *Desktop Study*

- 10.4.3 Pond fish culture has been centred in the northwest New Territories. About 92% of the fish farms are engaged in polyculture (including bighead carp, grass carp, common carp and silver carp in combination with tilapia or grey mullet). The remaining 8% practise monoculture of carnivorous species such as giant groupers, seabreams and spotted scat in brackish fishponds near to the coastline (AFCD, 2024b<sup>[11]</sup>).
- 10.4.4 According to the data from AFCD on aquaculture in Hong Kong, the production of pond fish was stabilised until 2021 but has declined significantly since 2022. Annual pond fish production and fishpond areas in the territory are listed in **Table 10.2** below. Local pond fish production only accounted for about 5% of total consumption of freshwater fish in 2022 (AFCD, 2024b<sup>[11]</sup>).

**Table 10.2 Annual Pond Fish Production and Fishpond Areas between 2013 and 2023**

Year	Pond Fish Production (tonne)	Fishpond Area (hectare)
2023	1,052	1,130
2022	2,100	1,130
2021	2,900	1,130

Year	Pond Fish Production (tonne)	Fishpond Area (hectare)
2020	2,500	1,130
2019	2,300	1,130
2018	2,500	1,130
2017	2,543	1,132
2016	2,543	1,135
2015	2,092	1,140
2014	2,001	1,140
2013	2,187	1,150

Source: AFCD, 2015<sup>[1]</sup>, 2016<sup>[2]</sup>, 2017<sup>[3]</sup>, 2018<sup>[4]</sup>, 2019<sup>[5]</sup>, 2020<sup>[6]</sup>, 2021<sup>[7]</sup>, 2022<sup>[8]</sup>, 2023<sup>[9]</sup>, 2024a<sup>[10]</sup>, 2024b<sup>[11]</sup>

### Fisheries Resources within the Assessment Area

#### *Recent Site Visit Findings*

- 10.4.5 The distribution and physical conditions of the fishponds are similar and comparable to the baseline conditions identified from literature review, which are considered relevant for assessment. According to the findings of site visits, scattered fishponds including active, inactive and abandoned fishponds were recorded across the assessment area. Within the assessment area, fishponds were mainly identified at the east near the NTMWTW and southeast of the assessment area. Some scattered fishponds were recorded along both sides of NTMDC. Clusters of fishponds were also identified to the west of San Tin Highway, mainly near Yau Mei San Tsuen and southwest near Man Yuen Chuen.
- 10.4.6 Among the fishponds recorded within the Project Site, over half of the fishponds were active. These active fishponds were mostly concentrated at the southeastern and eastern part of the Project Site, which were within less accessible village areas. Direct rainfall was the major water source of fishponds within the assessment area. Active fishponds identified within the Project Site were situated along the tributaries of NTMDC. These watercourses likely served as one of the supplementary water sources for fishponds at the eastern part of the Project Site. Other potential water sources for fishponds include wells and from adjacent fishponds where water was pumped and drained from one pond to another. Despite the higher portion of active fishponds recorded within the Project Site, these fishponds are scattered comparing with adjacent San Tin counterpart and are of smaller average pond size.
- 10.4.7 Apart from the recorded fishponds, three ponds were identified as “Other Ponds (non-fisheries related)”, including P#56 (i.e. a shallow, non-fisheries related pond to the southwest of Yau Mei San Tsuen), P#182 (i.e. Pok Wai Flood Water Pumping Station), and P#183 (i.e. Chuk Yuen Stormwater Pumping Station). The locations and statuses of the fishponds and other ponds within the assessment area are shown in **Figure 10.1.1 to 10.1.4**. Representative photos showing different types of fishponds are shown in **Appendix 10.1**.
- 10.4.8 A total of 183 number of ponds were identified within the assessment area. As a conservative approach, total loss of the fishponds was anticipated for fishponds which fall partially on the Project Site. As a result, among the 183 ponds, 110 number of fishponds (including 63 active fishponds, 19 inactive fishponds and 28 abandoned fishponds) fall wholly or partially within the Project Site. The average pond sizes within the assessment area and Project Site are 0.12 ha and 0.07 ha respectively. In terms of active fishponds, their total area accounts for 35.9% of the total ponds’ areas within assessment area and 55.5% within the Project Site. Details of the size and

number of ponds recorded within the assessment area and Project Site are presented in **Table 10.3** below.

**Table 10.3 Summary of Ponds Identified within the Assessment Area and Project Site**

Pond Status	Within Assessment Area		Within Project Site <sup>(1)</sup>	
	Size of pond (ha) (%) <sup>(2)</sup>	Number of pond	Size of pond (ha) (%) <sup>(2)</sup>	Number of pond
Active Fishponds	8.15 (35.9%)	90	4.08 (55.5%)	63
Inactive Fishponds	5.74 (25.3%)	38	0.86 (11.7%)	19
Abandoned Fishponds	6.79 (29.9%)	52	2.41 (32.8%)	28
Other Ponds (Non-fisheries related)	2.03 (8.9%)	3	-	-
<b>Total</b>	<b>22.71 (100%)</b>	<b>183</b>	<b>7.35 (100%)</b>	<b>110</b>

Notes:

- (1) Loss of whole fishpond has been assumed for partial encroachment of Project Site boundary onto fishpond.
- (2) The size and percentage included in this table have been subject to rounding adjustments. Any discrepancies between total and sums of individual numbers listed therein are due to rounding.

10.4.9 Quite a number of the active fishponds in the assessment area were found to be utilised for cultivation of non-edible ornamental fish, such as Koi (*Cyprinus carpio*), while some were utilised for edible fish species. The active fishponds along Ngau Tam Mei Road (i.e. P#27-31) were identified within the New Age Organic Farm which has been registered under the AFCD Accredited Fish Farm Scheme (AFCD, 2024c). Fishponds to the east of Yau Tam Mei Tsuen at the south of NTMDC (i.e. P#49-53) were under active management. At the southeastern part of the Project Site, several active fishponds (i.e. P#127-129, P#136-143, P#144-153, P#154 and P#157) were located within the village/private area and were inaccessible. Bird-scaring devices (e.g. nets) were installed at some of these active fishponds to prevent birds from preying on the edible/ornamental fish. A group of active fishponds were identified at the east of the Project Site near NTMWTW (i.e. P#59-64, P#75, P#77-80, P#82-97, P#101-114 and P#118-126; and indoor fishpond P#76). These active fishponds were mostly utilised for non-edible Koi culturing and practising intensive management. To the west of San Tin Highway, active fishpond (i.e. P#7, P#19, P#54, P#55, P#163 and P#165) were identified to the northwest of Yau Mei San Tsuen and to the southwest near Man Yuen Chuen, outside the Project Site.

10.4.10 Inactive fishponds were scattered across the assessment area, including those to the northwest near Ko Hang and Yau Mei San Tsuen (i.e. P#1-3, P#9, P#10, P#13-14 and P#18 and P#48), and to the southwest near Man Yuen Chuen (i.e. P#164, P#166 and P#175-180). A few were scattered along both sides of NTMDC (i.e. P#20-23, P#57, P#58, P#133-135 and P#158), while some were near NTMWTW (i.e. P#65-71, P#73, P#98-100 and P#115). These inactive fishponds were observed with no current utilisation for commercial aquaculture activities and lack of management for pond fish culture.

10.4.11 Numbers of abandoned fishponds were also recorded across the assessment area, including those to the northwest near Ko Hang and Yau Mei San Tsuen (i.e. P#4-6, P#8, P#11, P#12, P#15-17, P#47), and to the southwest near Man Yuen Chuen (i.e. P#159-162, P#167-174 and P#181). Wholly or partially within the Project Site, there were some abandoned fishponds identified along both sides of NTMDC and Yau Tam Mei Tsuen (i.e. P#24-26, P#32-46, P#116-117, P#130-132, P#155 and P#156), and at the west of the NTMWTW (i.e. P#72, P#74 and P#81). All of these abandoned fishponds were observed with no current utilisation for commercial aquaculture activities and with overgrown vegetations.

10.4.12 There are three “Other Ponds (non-fisheries related)” located at the west of San Tin Highway (i.e. P#56, P#182 and P#183). These three ponds were recorded to the southwest of Yau Mei San Tsuen, Chuk Yuen Stormwater Pumping Station and Pok Wai Flood Water Pumping Station respectively.

## 10.5 Identification and Evaluation of Potential Impacts

### Identification of Potential Impacts

10.5.1 Given that there are no capture fisheries or other aquaculture such as Fish Culture Zones, oyster culture, sites of fisheries importance within the assessment area, direct and indirect impacts to these resources are not anticipated. Potential impacts arising from the Project would be loss of fish culture area (i.e. fishponds), aquaculture activities and aquaculture potential within the Project Site. The loss of fishponds and other associated indirect impacts potentially occur during the construction and operational phases are listed in **Table 10.4** below.

**Table 10.4 Potential Impacts during the Construction and Operational Phase**

Phase	Direct Impact	Indirect Impact
Construction	<ul style="list-style-type: none"> <li>• Loss of active fishponds</li> <li>• Loss of inactive fishponds</li> <li>• Loss of abandoned fishponds</li> <li>• Loss of watercourses for aquaculture activities</li> </ul>	<ul style="list-style-type: none"> <li>• Deterioration of water quality and hydrological condition</li> <li>• Bund stability</li> <li>• Blockage of access</li> </ul>
Operational	Nil	<ul style="list-style-type: none"> <li>• Deterioration of water quality</li> <li>• Blockage of access</li> </ul>

10.5.2 Details of each identified potential impact on fisheries resources are further described and evaluated in the following sections, with reference made to the evaluation criteria denoted in the EIAO-TM. A summary of impacts on fisheries resources are provided in **Table 10.5** to **Table 10.7**.

### Construction Phase – Direct Impact

10.5.3 Under the Recommended Outline Development Plan (RODP) (**Figure 2.1** refers), fisheries resources within the Project Site would be subject to direct permanent impact due to the Project, resulting in direct loss of fishponds, associated fisheries production, aquaculture activities and aquaculture potential. As a conservative approach, loss of whole pond has been assumed for partial encroachment of Project Site boundary onto fishpond due to construction activities.

10.5.4 Key fisheries resources within the Project Site, including active fishponds, inactive fishponds and abandoned fishponds, were mainly located at the southeast and the eastern part of the Project Site near NTMWTW and in Yau Tam Mei Tsuen area.

*Loss of Active Fishponds*

- 10.5.5 Within the Project Site, quite a number of active fishponds were utilised by non-edible ornamental fish cultivation such as Koi. These active fishponds were mostly situated at southeastern and eastern Project Site near NTMWTW. A few active fishponds were situated near Yau Tam Mei Tsuen and along Ngau Tam Mei Road (**Figure 10.1** refers).
- 10.5.6 Direct permanent loss of fisheries production and aquaculture activities at active fishponds (about 4.08 ha) would be resulted from the Project (**Table 10.3** refers). The expected loss of 4.08 ha active fishponds accounts for about 55.5% of the total fishpond areas within the Project Site and only 0.4% of fishpond areas in Hong Kong in terms of aquaculture.
- 10.5.7 Considering the area of permanent loss of active fishponds does not account for a significant proportion of the total fishpond areas in Hong Kong, the impact on fisheries resources is considered to be low.

*Loss of Inactive Fishponds*

- 10.5.8 Similarly, the Project would result in direct loss of 0.86 ha inactive fishpond, mostly situated at the southeastern and the eastern Project Site near NTMWTW (**Table 10.3** and **Figure 10.1** refer). The expected direct loss of inactive fishponds accounts for about 11.7% of the total fishpond areas within the Project Site and makes up less than 0.1% of the fishpond areas in Hong Kong.
- 10.5.9 These inactive fishponds were observed without aquaculture activities and with overgrown pond bunds during recent site visits. These inactive fishponds are not anticipated to support significant fisheries production. Considering the loss of inactive fishponds does not account for a significant proportion of the total fishponds area in Hong Kong, the impact on fisheries recourse is considered low.

*Loss of Abandoned Fishponds*

- 10.5.10 The Project would result in direct loss of 2.41 ha abandoned fishpond, mostly located near Yau Tam Mei Tsuen and at the southeastern part of the Project Site (**Table 10.3** and **Figure 10.1** refer). The expected loss of 2.41 ha abandoned fishponds accounts for about 32.8% of the total fishpond areas within the Project Site and makes up 0.2% of the fishpond areas in Hong Kong.
- 10.5.11 No fisheries activities were observed at these abandoned fishponds. The conditions of these fishponds are no longer suitable for short-term resumption of fisheries activities given the physical constraints such as inaccessibility, deterioration of pond bund, etc., and therefore are not anticipated to support significant fisheries production. The loss of these abandoned fishpond areas is unlikely to result in significant impact on aquaculture activities.

*Loss of Watercourses for Aquaculture Activities*

- 10.5.12 Based on the RODP, watercourses within Project Site, except NTMDC, would be permanently lost. Nonetheless, watercourses/streams directing from hillside area at the east of the assessment area, outside the Project Site, would not be impacted by the Project, and the major water source for fishponds within the assessment area would be from direct rainfall. As a result, impact to aquaculture activities in terms of



loss of water sources for unaffected fishponds and aquaculture activities outside the Project Site, near NTMWTW and near Yau Mei San Tsuen, were not anticipated.

#### Construction Phase – Indirect Impact

##### *Deterioration of Water Quality and Hydrological Condition*

- 10.5.13 Active and inactive fishponds were identified directly adjacent to the east of the Project Site near NTMWTW. Considering the proximity of these fishponds to the Project Site, indirect impact on fisheries such as water quality impacts may arise from uncontrolled construction site run-off and accidental spillage, etc.
- 10.5.14 Uncontrolled site run-off, chemical waste and sediment generated from construction activities could potentially cause adverse water quality impacts to the adjoining watercourses and water bodies, including parameters such as pH value, dissolved oxygen (DO) and salinity. On the other hand, the use and storage of chemicals, such as engine oil and lubricants, during construction phase, may affect water quality if spillage occurs and enters the adjacent water bodies. Groundwater pollution may also arise from improper handling and storage of chemicals within the works sites, where groundwater infiltrates. Without mitigation measures, these potential water quality impacts may result in potentially low to moderate impacts on the remaining active and inactive fishponds adjacent to the Project Site.
- 10.5.15 Examples of relevant water quality control measures are provided in **Section 10.7**, while details of these mitigation measures are detailed in **Section 5**. Considering that the adjacent fishponds are located at the upstream of the nearby watercourses, and the major water source for fishponds within the assessment area would be from direct rainfall, with proper implementation of the proposed mitigation measures, unacceptable impacts on water quality are not expected, and thus no adverse impacts on cultured fish due to potential water quality deterioration is anticipated during the construction phase.

##### *Bund Stability*

- 10.5.16 Construction activities that occur adjacent or in close vicinity to the fishponds located to the east of the Project Site near NTMWTW may affect the integrity of the pond bunds, potentially resulting in instability of the pond structure, or water seepage.
- 10.5.17 In the absence of mitigation measures, this indirect impact could inhibit pond usage and result in potentially low to moderate impact on the remaining active and inactive fishponds adjacent to the eastern Project Site. With appropriate mitigation measures implemented to ensure the stability of the pond bund during construction phase (e.g. sheet pile wall and associated grouting, further described in **Section 10.7**), adverse impacts on aquaculture activities are not anticipated.

##### *Blockage of Access*

- 10.5.18 During construction phase, construction activities may affect the existing access to the remaining active fishponds at the eastern part of the assessment area near NTMWTW. Without mitigation measures, this may result in low to moderate impact to these fishpond areas. Mitigation measures (e.g. provision of alternative access road and access arrangement) should be in place to minimise the potential blockage and the associated impact on fishpond areas during construction phase.

Operational Phase – Direct Impact

- 10.5.19 Based on the proposed land uses under the RODP, no additional direct impacts on fisheries resources (e.g. loss of fishponds) are anticipated during the operational phase of the Project.

Operational Phase – Indirect Impact

*Deterioration of Water Quality*

- 10.5.20 As discussed above, active and inactive fishponds were identified directly adjacent to the east of the Project Site near NTMWTW. Potential indirect impacts may arise from uncontrolled surface run-off and subsequent deterioration in water quality. In the absence of mitigation measures, this could result in potentially low to moderate impacts on these remaining fishponds.

- 10.5.21 Mitigation measures would be implemented to minimise the potential water quality impact arising from the operational phase of the Project (**Section 5** refers). Given the drainage system of the Project Site would be properly designed and implemented, in addition to direct rainfall as the major water source for fishponds within the assessment area, adverse impacts on cultured fish due to potential water quality deterioration during the operational phase are not anticipated.

*Blockage of Access*

- 10.5.22 Considering that access road and access arrangement will remain upon completion of construction works, no further impact is anticipated to arise during the operational phase of the Project.

Summary of Fisheries Impact

- 10.5.23 Based on the above discussion, the potential impacts on fisheries resources arising from the construction, operation, and associated wetland enhancement of the Project, where present, are summarised in **Table 10.5** to **Table 10.7** below.

**Table 10.5 Summary of Impact on Fisheries Resources (Active Fishponds) within Assessment Area**

Criteria	Construction Phase	Operational Phase
Nature of impact	<u>Direct impact:</u> - Permanent loss of active fishponds within Project Site, quite a number were utilised for non-edible ornamental fish cultivation  <u>Indirect impact:</u> - Reversible indirect water quality impacts to fishponds directly adjacent to Project Site, due to potential construction site run-off, accidental spillage and potential contamination of	<u>Direct impact:</u> - Nil  <u>Indirect impact:</u> - Reversible indirect water quality impacts to fishponds directly adjacent to Project Site, due to potential uncontrolled surface run-off and subsequent deterioration in water quality

Criteria	Construction Phase	Operational Phase
	surface water and groundwater - Reversible indirect impact on bund stability to fishponds directly adjacent to Project Site - Reversible indirect impact on accessibility to fishponds adjacent to Project Site caused by construction activities	
Size of affected area	<u>Direct impact:</u> - Permanent loss of active fishponds within Project Site: 4.08 ha  <u>Indirect impact:</u> - Active fishponds directly adjacent to the east of Project Site: 1.65 ha	<u>Direct impact:</u> - Nil  <u>Indirect impact:</u> - Active fishponds adjacent to the east of the Project Site: 1.65 ha
Loss of fisheries resources / production	Direct loss of aquaculture activities and fisheries production within Project Site (quite a number were utilised for non-edible ornamental fish cultivation such as Koi)	Nil
Destruction and disturbance of nursery and spawning grounds	Not Applicable (Remark: No nursery and spawning ground within assessment area)	
Impacts on fishing activity	Not Applicable (Remark: No fishing activities within assessment area)	
Impact on aquaculture activity	Low direct and indirect impact affecting small area of active fishponds within Project Site in the absence of mitigation measures, given quite a number of the active fishponds were for non-edible ornamental fish cultivation	Low indirect impact affecting small area of active fishponds next to the Project Site
<b>Overall impact before mitigation</b>	<b>Low</b>	<b>Low</b>

**Table 10.6 Summary of Impact on Fisheries Resources (Inactive Fishponds) within Assessment Area**

Criteria	Construction Phase	Operational Phase
Nature of impact	<u>Direct impact:</u> - Permanent loss of inactive fishponds (which may also result in loss of aquaculture potential) <u>Indirect impact:</u> - Reversible indirect water quality impacts to fishponds directly adjacent to Project Site, due to potential construction site run-off, accidental spillage and potential contamination of surface water and groundwater during construction phase - Reversible indirect impact on bund stability during construction phase - Reversible indirect impact on accessibility to adjacent fishponds caused by construction activities	<u>Direct impact:</u> - Nil  <u>Indirect impact:</u> - Reversible indirect water quality impacts to fishponds directly adjacent to Project Site, due to uncontrolled surface run-off and subsequent deterioration in water quality
Size of affected area	<u>Direct impact:</u> - Permanent loss of inactive fishpond: 0.86 ha <u>Indirect impact:</u> - Inactive fishponds directly adjacent to the east of Project Site: 0.22 ha	<u>Direct impact:</u> - Nil  <u>Indirect impact:</u> - Inactive fishponds directly adjacent to the east of Project Site: 0.22 ha
Loss of fisheries resources / production	Considering no active aquaculture observed, no loss of fisheries production anticipated	Nil
Destruction and disturbance of nursery and spawning grounds	Not Applicable (Remark: No nursery and spawning ground within assessment area)	
Impacts on fishing activity	Not Applicable (Remark: No fishing activities within assessment area)	
Impact on aquaculture activity	No impact is anticipated on aquaculture activity	

Criteria	Construction Phase	Operational Phase
<b>Overall impact before mitigation</b>	<b>Low</b>	<b>Low</b>

**Table 10.7 Summary of Impact on Fisheries Resources (Abandoned Fishponds) within Assessment Area**

Criteria	Construction Phase	Operational Phase
Nature of impact	<u>Direct impact:</u> - Permanent loss of abandoned fishponds <u>Indirect impact:</u> - Nil	No adverse direct and indirect impacts are anticipated
Size of affected area	<u>Direct impact:</u> - Permanent loss of abandoned fishpond: 2.41 ha <u>Indirect impact:</u> - Nil	Not Applicable
Loss of fisheries resources / production	Considering no active aquaculture observed, no loss of fisheries production anticipated	Not Applicable
Destruction and disturbance of nursery and spawning grounds	Not Applicable (Remark: No nursery and spawning ground within assessment Area)	
Impacts on fishing activity	Not Applicable (Remark: No fishing activities within assessment Area)	
Impact on aquaculture activity	No impact is anticipated on aquaculture activity	
<b>Overall impact before mitigation</b>	<b>Low</b>	<b>Not Applicable</b>

## 10.6 Cumulative Impact

- 10.6.1 Cumulative impact may arise from the construction and operation of the Project, due to interaction with other developments in the area. The list of concurrent projects is stated in **Table 2.7**. Major concurrent projects that may impose cumulative impact on aquaculture activities and production include the NOL Main Line, NTMWTW Extension and STL MC DN. The direct loss of fishponds areas within the assessment area due to concurrent projects are listed below.

**Table 10.8 Identified Fishpond Areas under Concurrent Development Projects within the Assessment Area**

	<b>Northern Link Main Line</b>	<b>Ngau Tam Mei Water Treatment Works Extension</b>	<b>San Tin / Lok Ma Chau Development Node</b>
Size of fishponds	Active: 0.01 ha Inactive: 0.04 ha Abandoned: 0.20 ha	Nil	Active: 0.01 ha
<b>Total Area</b>			<b>0.25 ha</b>

Note:

(1) The size included in this table has been subject to rounding adjustments. Any discrepancies between total and sums of individual numbers listed therein are due to rounding.

- 10.6.2 The total direct loss area of fishponds due to concurrent projects is limited (i.e. 0.25 ha) and the total direct loss of fishpond areas due to the Project and concurrent projects within the assessment area accounts for a loss of 0.7% of the overall fishpond areas in Hong Kong. Cumulative impact on fisheries is therefore considered as low.

## **10.7 Mitigation Measures**

- 10.7.1 According to the general policy of mitigating fisheries impacts as discussed in Annex 17 of EIAO-TM, mitigation measures for minimisation of impacts to the fishponds in the vicinity of the Project Site are recommended below.

### Minimisation

#### *Maintaining Bund Stability*

- 10.7.2 During the construction stage, all the affected fishponds (including fishponds located partially within the Project Site) should be isolated and disconnected from any existing watercourses in order to minimise the potential water quality impact to the adjacent water bodies. The fishpond would be drained before filling up these areas or before commencement of any excavation or construction works. For affected fishponds located partially within the Project Site, a layer of shoring or sheet pile wall should be erected along the site boundary adjacent to the affected fishponds in order to maintain bund stability of the remaining bunds outside the Project Site and the adjacent fishponds. In addition, the shoring / sheet pile wall should have grouting or a grout curtain to avoid water seepage from the affected fishpond to the adjacent area. With the implementation of shoring / sheet pile, the stability of the remaining affected / adjacent fishpond bund should be preserved and the impacts on aquaculture activities should be minimised.

#### *Minimisation of Potential Water Quality Impacts*

- 10.7.3 In order to minimise the potential indirect fisheries impacts due to deterioration of water quality, including parameters such as pH value, dissolved oxygen (DO) and salinity, on the adjacent fishponds, mitigation measures and good site practices should be implemented during the construction phase, details refer to **Section 5**.

Examples of guidelines for control of construction site run-off and construction-related activities, as well as other good site practices, are described below. With proper implementation of the proposed mitigation measures, unacceptable impacts on water quality are not anticipated.

#### *Control of Construction Site Run-off*

- Implementation of Best Management Practices, following the guidelines for handling and disposal of construction site discharges detailed in ProPECC PN 2/24 *Construction Site Drainage* and ETWB TC (Works) No. 5/2005 *Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works*;
- Controlling surface run-off from construction site via adequately designed channels, earth bunds or sandbag barriers, and directing the run-off to sand / silt removal facilities such as sand traps, silt traps and sedimentation basins before discharging to storm drains;
- Minimising soil excavation in wet season (April to September) as far as practicable, and proper covering of temporarily exposed slope surfaces, while intercepting channels should be provided along the crest / edge of excavation; and
- Proper covering of open stockpiles of construction materials during rainstorms (e.g. with tarpaulin or similar fabric).

#### *Control of Construction-related Activities*

- All vehicles and plants should be cleaned before they leave the construction site to minimise the deposition of earth, mud and debris in surrounding areas;
- Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralised to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralised wastewater should be transported off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters; and
- The Waste Disposal Ordinance (Cap. 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for control of chemical wastes. The Contractor is also recommended to develop management procedures for chemicals used and prepare an emergency spillage handling procedure to deal with chemical spillage in case of accidents.

#### *Other Good Site Practices*

- Nomination of approved personnel, such as a site manager, to be responsible for implementation of good site practices, arrangements for waste collection and effective disposal to an appropriate facility;
- Training of site personnel in site cleanliness, concepts of waste reduction, reuse and recycling, proper waste management and chemical waste handling procedures;
- Provision of sufficient waste reception / disposal points, and regular collection of waste;

- Adoption of appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- Provision of regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- Adoption of a recording system for the amount of wastes generated, recycled and disposed (including the disposal sites); and
- Preparation of Waste Management Plan (WMP), as part of the Environmental Management Plan (EMP).

## **10.8 Evaluation of Residual Fisheries Impacts**

- 10.8.1 As described in **Section 10.5**, in the absence of mitigation measure, low to moderate indirect impacts, including bund stability, deterioration of water quality and blockage of access, may arise from the construction phase of the Project. However, with the implementation of the proposed mitigation measures and good site practices listed in **Section 10.7**, unacceptable adverse impacts on fisheries are not expected to arise during the construction phase. Hence, residual impact on water quality deterioration is not anticipated from the Project upon the implementation of the proposed mitigation measures.

## **10.9 Environmental Monitoring and Audit**

- 10.9.1 With the implementation of mitigation and precautionary measures proposed in **Section 5**, potential water quality impacts arising from the Project would be minimised. No specific EM&A programme is required for the potential water quality impact in association with fisheries impact. The monitoring and audit requirement have been covered by the EM&A programme for potential water quality impact recommended in **Section 5**.

## **10.10 Conclusion**

- 10.10.1 Fisheries impact assessment based on the existing available information and site inspections on pond culture fisheries resources and activities within the assessment area have been undertaken, following the criteria and guidelines as stated in Annexes 9 and 17 of the EIAO-TM, and the requirements in the EIA Study Brief (ESB-363/2023).
- 10.10.2 Key fisheries resources within the assessment area include active fishponds situated at the southeastern and eastern part of the assessment area near the NTMWTW. Quite a number of the active fishponds in the assessment area were found to be utilised by non-edible ornamental fish cultivation such as Koi. Some inactive and abandoned fishponds were identified along both sides of NTMDC and Yau Tam Mei Tsuen within the Project Site. On the other hand, clusters of fishponds, including inactive and abandoned fishponds, were recorded at the northwest of the assessment area near Yau Mei San Tsuen and at the southwest near Man Yuen Chuen.
- 10.10.3 Under the conservative approach, permanent loss of potential fisheries resources, including 4.08 ha active fishponds, 0.86 ha inactive fishponds and 2.41 ha abandoned fishponds, is anticipated under the Project. These active, inactive and abandoned fishponds comprising about 0.4%, less than 0.1% and 0.2% of fishponds areas in Hong Kong respectively. The area involved is considered as small in terms of the overall fishpond areas in Hong Kong (i.e. less than 1% in total) and quite a number



of the active fishponds were utilised for non-edible ornamental fish cultivation. The fisheries impact arising from the Project is therefore considered to be low.

- 10.10.4 Upon the implementation of recommended mitigation measures, no adverse impact on fisheries resources is anticipated from the construction and operational phase of the Project.

## 10.11 References

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