

Drainage Services Department
Agreement No. 1/2015 (DS) North
East New Territories Sewerage
System Upgrade and North
District Sewerage - Investigation,
Design and Construction
Project Profile for Sewage Pumping
Stations at North East New
Territories

244960-REP-115-04e

Final | December 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 244960

Ove Arup & Partners Hong Kong Ltd
Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong
www.arup.com

ARUP

Contents

	Page
1 Basic Information	1
1.1 Project Title	1
1.2 Background and Scope of the Project	1
1.3 Purpose and Nature of the Project	1
1.4 Name of Project Proponent	2
1.5 Location and Scale of the Project	2
1.6 Number and Types of Designated Projects to be Covered by the Project Profile	3
1.7 Name and Telephone Number of Contact Persons	3
1.8 Public Consultation/ Engagement	4
2 Outline of Planning and Implementation Programme	5
2.1 Project Implementation	5
2.2 Project Programme	5
2.3 Potential Interface with Other Projects	5
3 Major Elements of the Surrounding Environment	7
3.1 Air Quality	7
3.2 Noise	9
3.3 Water Quality	12
3.4 Landscape and Visual	15
3.5 Ecology	15
3.6 Cultural Heritage	16
3.7 Land Contamination	17
4 Possible Impacts on the Environment	20
4.1 Air Quality	20
4.2 Noise	22
4.3 Water Quality	25
4.4 Waste	27
4.5 Landscape and Visual	29
4.6 Ecology	31
4.7 Cultural Heritage	32
4.8 Land Contamination	32
5 Environmental Mitigation Measures to be Incorporated in the Design and Any Further Environmental Implications	33
5.1 Air Quality	33
5.2 Noise	34
5.3 Water Quality	35

5.4	Waste	37
5.5	Landscape and Visual	38
5.6	Ecology	40
5.7	Cultural Heritage	40
5.8	Land Contamination	41
5.9	Environmental Monitoring & Audit	41
5.10	Severity, Distribution and Duration of Environmental Effects and Further Implications	41
5.11	History of Similar Projects	41
6	Use of Approved EIA Reports / Direct EP Applications	43
7	Conclusion	44

Figures

Appendices

Appendix 1.1

Section Drawings of the Proposed SPSs

Appendix 2.1

Locations of Concurrent Projects

Appendix 3.1

Photos of Representative Existing NSRs

Appendix 3.2

Historical Aerial Photos

Appendix 3.3

Correspondence with FSD

Appendix 3.4

Correspondence with EPD

Appendix 3.5

Site Walkover Checklist

Appendix 4.1

Plant Inventory

Appendix 4.2

Cumulative Construction Noise Calculation

Appendix 4.3

Calculation of Maximum Permissible SWLs of the Upgraded/ New Pumping Stations

1 Basic Information

1.1 Project Title

1.1.1 Sewage Pumping Stations at North East New Territories (NENT) (the Project).

1.2 Background and Scope of the Project

1.2.1 Ove Arup & Partners Hong Kong Limited (Arup) has been commissioned by the Drainage Services Department (DSD) of Hong Kong Special Administrative Region (HKSAR) Government under Agreement No. CE 1/2015 (DS) on 6 August 2015 to provide consultancy services for the investigation, design and construction of North East New Territories Sewerage System Upgrade and North District Sewerage - Investigation, Design and Construction (the Study). The Study consists of 2 parts: Part 1 – NENT Sewerage System Upgrade; and Part 2 – North District Sewerage at Nam Chung (NC) and Luk Keng (LK). The Project is under Part 1 works which are discussed below.

1.2.2 The Project involves reconstruction of the existing Ping Che Road Tong Fong Sewage Pumping Station (SPS), construction of the new Man Kam To Road Sha Ling SPS, and minor upgrading of the existing Ping Che Road Kat Tin SPS.

1.2.3 The leachate and sewage flow within the catchment of the NENT sewerage system is expected to increase which is associated with the following, and hence the Project is required to cope with the projected sewage flow.

- The progressive implementation of the following village sewerage programme;
- The existing Agriculture, Fisheries and Conservation Department (AFCD)'s Ta Kwu Ling Operation Centre;
- The proposed Police training facilities;
- NENT Landfill extension;
- Organic Waste Treatment Facilities; and
- Sha Ling Columbarium and Crematorium Development.

1.2.4 To achieve environmental enhancements of the Project, several measures are taken in the design of new Ping Che Road Tong Fong SPS and Man Kam To Sha Ling SPS. For the new Man Kam To Sha Ling SPS, solar panels will be installed on the roof to enhance the use of renewable energy and reduce energy consumption of the SPS. Sustainable drainages (SUDs) are also promoted in the proposed SPSs with the use of rain garden in the new Man Kam To Sha Ling SPS and green roof in the new Ping Che Road Tong Fong SPS. To minimize the energy consumption in SPSs, high energy efficiency electrical appliances such as lamps and air-conditioners will be used.

1.3 Purpose and Nature of the Project

1.3.1 The Project is a sewerage system improvement project. The purpose of the Project is to reconstruct and operate the existing Ping Che Road Tong Fong SPS, to construct

and operate the new Man Kam To Road Sha Ling SPS as well as to have minor upgrade and operate the existing Ping Che Road Kat Tin SPS with sufficient capacity to cope with the projected sewage flow increase.

1.3.2 This Project Profile is prepared to establish the environmental acceptability of the Project, and to seek permission from the Director of Environmental Protection (DEP) to apply directly for an Environmental Permit (EP) under Section 5(11) of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). The Project is applying directly for EP as the predicted environmental impacts from the Project are unlikely to be adverse and the mitigation measures described in this Project Profile meet the requirements of the Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO) as demonstrated in the below sections.

1.4 Name of Project Proponent

1.4.1 The Project Proponent is Drainage Service Department (DSD).

1.5 Location and Scale of the Project

1.5.1 The SPSs are located at areas to the west of Ping Che Kat Tin, north west of Ping Che Tong Fong and south of Man Kam To Sha Ling. The upgraded Ping Che Road Kat Tin SPS is located within the footprint of the existing Ping Che Road Kat Tin SPS. The new Ping Che Road Tong Fong SPS is located at the channelized tributary of Ping Yuen River covering the footprint of the existing Ping Che Road Tong Fong SPS. The new Man Kam To Sha Ling SPS is located at the existing DSD site office adjacent to the intersection of Man Kam To Road and Kong Nga Po Road. The locations of the Project are shown in **Figure 1.1**.

1.5.2 The key dimensions and installed capacities of the existing and proposed pumping stations at Ping Che Kat Tin, Ping Che Tong Fong and Man Kam To Sha Ling are summarized in **Table 1.1**. Section drawings of the proposed SPSs are shown in **Appendix 1.1**.

Table 1.1: Dimension and Installed Capacity of the Existing and Proposed Pumping Stations

Existing Pumping Station			Proposed Pumping Station		
Pumping Station	Dimension (Plan Area)	Installed Capacity (m ³ /day) ^[1]	Pumping Station	Dimension (Plan Area)	Installed Capacity (m ³ /day) ^[1]
Ping Che Road Kat Tin SPS ^[2]	8.4m x 4.3m	756	Ping Che Road Kat Tin SPS ^[2]	8.4m x 4.3m	2,139
Ping Che Road Tong Fong SPS ^[3]	8.4m x 4.3m	540	Ping Che Road Tong Fong SPS ^[3]	Approx. 27.5m x 9.0m	6,092
Man Kam To Road Sha Ling Leachate Pumping Station (LPS) ^[4]	8.4m x 4.3m	972	Man Kam To Sha Ling SPS ^[4]	Approx. 36.0m x 13.0m	11,032 (Sewage) 4,000 (Leachate)

Note:

[1] Installed Capacity = Average Dry Weather Flow (ADWF) in m³/day

[2] Minor upgrading works only

[3] Existing SPS to be demolished and replaced by a new SPS at the same site

[4] Existing LPS to be demolished and a new SPS to be constructed at another site

1.5.3 The major works of the Project involve the following activities:

- Reconstruction of the existing Ping Che Road Tong Fong SPS¹ including (i) demolition of existing Ping Che Road Tong Fong SPS, (ii) a 20m long 3.5m(W) x 3m(H) drainage box culvert to replace the existing engineered concrete low-flow channel, with the same flow direction and alignment to the existing channel, and (iii) construction of new Ping Che Road Tong Fong SPS to deck over the box culvert;
- Construction of the new Man Kam To Road Sha Ling SPS²;
- Minor upgrading of the existing Ping Che Road Kat Tin SPS. Works include replacement of pumps, replacement of internal pipeworks within dry well/valve chamber and associated civil works, provision of at least one duty and one standby pump, provision of dual-feed electricity power supply system if required, provision of sewage emergency overflow system if required, and SCADA system, control and instrumentation; and
- Associated earth works, trench support and ground compaction works, concrete building works, backfilling works and surfacing works.

1.6 Number and Types of Designated Projects to be Covered by the Project Profile

1.6.1 The proposed upgraded Ping Che Road Kat Tin SPS, new Ping Che Road Tong Fong SPS and new Man Kam To Road Sha Ling SPS would have installed capacity of more than 2000m³ per day and boundary of less than 150m from an existing or planned residential area. The Project is therefore classified as Designated Project (DP) under Item F.3(b) of Part I, Schedule 2 of the EIAO.

1.6.2 In addition, the new Ping Che Road Tong Fong SPS would encroach into the channelized tributary of Ping Yuen River. As stated in **Section 1.5.3**, a new 20m long 3.5m(W) x 3m(H) drainage box culvert is proposed to replace the existing engineered concrete low-flow channel, with the same flow direction and alignment to the existing channel. Since the channelized tributary of Ping Yuen River is a drainage channel that discharges into Deep Bay within 300m from environmental sensitive receivers including the Mai Po Marshes Site of Special Scientific Interest (SSSI) and conservation area at Mai Po, the Project is classified as a DP under Item I.1(b) of Part I, Schedule 2 of the EIAO.

1.7 Name and Telephone Number of Contact Persons

1.7.1 All queries regarding the Project can be addressed to:

Mr. CHENG Po Yuen (Sr Engr/Consultants Mgt 2)

Drainage Services Department
Sewage Services Branch

¹ The existing Ping Che Road Tong Fong SPS is encroached in the Project site for the new Ping Che Road Tong Fong SPS. Therefore, the demolition of the existing Ping Che Road Tong Fong SPS is included in the scope of the Project.

² The existing Man Kam To Road Sha Ling LPS is located at ~85m away to the north of the Project site for the new Man Kam To Road Sha Ling SPS. The demolition of the existing Man Kam To Sha Ling LPS will be independent from the construction and operation of the new Man Kam To Sha Ling SPS. Therefore, the demolition of the existing Man Kam To Sha Ling SPS is excluded in the scope of the Project.

Consultants Management Division
Group 2

42/F, Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong

Tel.: 2594 7255

1.8 Public Consultation/ Engagement

1.8.1 Public Consultation/ Engagement had been conducted and general support was gained. District Minor Works and Environmental Improvement Committee under North District Council was consulted on 21 May 2018 regarding the proposed sewerage works in Northeast New Territories District. Members of the Committee supported the implementation of the proposed works.

2 Outline of Planning and Implementation Programme

2.1 Project Implementation

2.1.1 The Project will be implemented by engaging relevant professionals throughout the planning, design, construction and implementation stages. DSD will be responsible for operating and maintaining the Project throughout the operation phase.

2.2 Project Programme

2.2.1 The construction of the Project will tentatively commence in 2021 Q4 for completion in 2027 Q2.

2.3 Potential Interface with Other Projects

2.3.1 Major committed projects in NENT that may have potential interface with the Project have been identified as listed below in **Table 2.1**. **Drawing 244960/C/GLP/P1/002** in **Appendix 2.1** illustrates the locations of these concurrent projects. The concurrent projects listed below and in **Appendix 2.1** are within 500m of the assessment area of three SPSs. Potential cumulative impacts with these concurrent projects are addressed in relevant sections below.

Table 2.1: List of Concurrent Projects

Department	Project Title	Construction Programme
CEDD	Agreement No. CE 1/2013(CE) – Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium & Related Facilities at Sandy Ridge Cemetery – Design and Construction	Contract 1: early 2018 to end 2023 Contract 2: mid 2018 to early 2024 Contract 3: Tentatively 2021 Q1 to 2024 Q4
CEDD	Agreement No. CE13/2014(CE) – Development of Kwu Tung North and Fanling North – New Development Areas, Phase 1 – Design and Construction	Advance Work (including proposed SPS): 2017 to 2022 Main Work: 2019 to 2023
CEDD	Agreement No. CE60/2016(CE) – Site Formation and Infrastructure Works for Police Facilities in Kong Nga Po	2019 to 2023 Q1
EPD	North East New Territories (NENT) Landfill Extension	2020 to 2023
EPD	Agreement No. CE34/2011(EP) – Organic Waste Treatment Facilities, Phase 2 – Feasibility Study	2019 Q1 to 2021 Q3
HyD	PWP Item No. 6863H – Widening of Western Section and Eastern Section of LMH Road	2020 Q3 to 2025 Q3
HyD Lighting Division	On-going public lighting works to improve the public lighting system	Keep in view
WSD	9355WF - Water Supply to New Housing Developments in Sheung Shui and Fanling – Investigation, Design and Construction	Sep 2018 to 2024 Q1

Department	Project Title	Construction Programme
WSD	Mainlaying along LMH Road and Ping Che Road and Uprating of LMH Pump House and Pak Fu Shan Header Tank	Mainlaying along Ping Che Road and construction of pump house and header tank: end 2021 to mid 2026 Mainlaying along LMH Road: To tally with the implementation of HyD LMH Road Widening Project.
WSD	CE67/2017(WS) - Reclaimed Water Supply to Sheung Shui and Fanling – Investigation, Design and Construction	2021 to 2027
DSD	4165CD - Drainage Improvement Works at North District	2021 to 2027
DSD	PWP No. 4173CD Drainage Improvement Works in Ta Kwu Ling	2023

3 Major Elements of the Surrounding Environment

3.1 Air Quality

Air Sensitive Receivers

3.1.1 Air Sensitive Receiver (ASR) is defined in Annex 12 of the Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO) as “domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, education institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre”.

3.1.2 Representative ASRs within a distance of 500m from the Project boundary of each SPS have been identified and summarized in **Table 3.1** and shown in **Figure 3.1**.

Table 3.1: Selected Representative ASRs

ASR ID	Description	Use ^[1]	Nearest Upgraded/ New Pumping Station (m)	Distance from the Pumping Station (m)
Existing ASRs				
A1	House 6C, Tong Fong	R	Ping Che Road Tong Fong SPS	~85
A2	House 13, Kan Tau Wai	R	Ping Che Road Tong Fong SPS	~105
A3	Kan Tau Wai Playground	Rec	Ping Che Road Tong Fong SPS	~110
A4	House 1C, Lei Uk	R	Ping Che Road Tong Fong SPS	~210
A5	Fung Wong Wu Playground	Rec	Ping Che Road Tong Fong SPS	~230
A6	House 11-12, Ta Kwu Ling Village	R	Ping Che Road Tong Fong SPS	~330
A7	House 190, Sha Ling	R	Man Kam To Road Sha Ling SPS	~120
A8	House 183, Sha Ling	R	Man Kam To Road Sha Ling SPS	~140
A9	House 16C, Hung Kiu San Tsuen	R	Man Kam To Road Sha Ling SPS	~420
A10	Ping Che Children’s Playground	Rec	Ping Che Road Kat Tin SPS	~35
A11	Ping Che Village Office	G/IC	Ping Che Road Kat Tin SPS	~45
A12	House 93, Ping Che Kat Tin	R	Ping Che Road Kat Tin SPS	~25
A13	Yuen Chen Hall, Wun Chuen Sin Koon	P	Ping Che Road Kat Tin SPS	~330
A14	Ping Yeung Public School	E	Ping Che Road Kat Tin SPS	~230

ASR ID	Description	Use ^[1]	Nearest Upgraded/ New Pumping Station (m)	Distance from the Pumping Station (m)
A15	House 121, Ping Che Yuen Ha	R	Ping Che Road Kat Tin SPS	~115
A16	Ping Che New Village Sitting-out Area	Rec	Ping Che Road Kat Tin SPS	~400
A17	Ping Che Mini-Soccer Pitch	Rec	Ping Che Road Kat Tin SPS	~350
A18	Temporary House at Sha Ling	R	Ping Che Road Sha Ling SPS	~35
A19	Village House at Sha Ling	R	Ping Che Road Sha Ling SPS	~130
Planned ASR				
PA1	Planned Village House at Tong Fong	R	Ping Che Road Tong Fong SPS	~25

Note:

[1] R – Residential premises; Rec – Recreational; G/IC – Government, Institution or Community

3.1.3 Potential air quality impacts during construction phase include fugitive dust generated by construction activities as well as exhaust emissions from construction plants. Potential air impacts during operational phase include odour generated by the upgraded/ new pumping stations.

Existing Ambient Air Quality Conditions

3.1.4 The existing ambient air quality could refer to the air quality monitoring station at Tai Po which is the station nearest to the Project. Air quality at the Tai Po Station is representative of existing air quality at the Project. **Table 3.2** summarises the air quality monitoring data between 2015 and 2019.

Table 3.2: Air Quality Monitoring Data (Tai Po Station, 2015 – 2019)

Pollutant	Parameter	Concentrations ($\mu\text{g}/\text{m}^3$)						5-year mean	AQOs ($\mu\text{g}/\text{m}^3$)
		2015	2016	2017	2018	2019			
SO ₂	4 th highest 10-minute	56	37	39	24	20	35 [7%]	500 (3)	
	4 th highest 24-hour	13	10	9	8	10	10 [8%]	125 (3)	
NO ₂	19 th highest 1-hour	136	112	127	125	142	128 [64%]	200 (18)	
	Annual	37	33	39	36	36	36 [91%]	40	
CO	Max. 1-hour	N/M	N/M	N/M	N/M	N/M	N/M	30,000	
	Max. 8-hour	N/M	N/M	N/M	N/M	N/M	N/M	10,000	
O ₃	10 th highest 8-hour	157	147	181	167	197	170 [106%]	160 (9)	

Pollutant	Parameter	Concentrations ($\mu\text{g}/\text{m}^3$)						AQOs ($\mu\text{g}/\text{m}^3$)
		2015	2016	2017	2018	2019	5-year mean	
RSP	10 th highest 24-hour	77	74	82	69	65	73 [73%]	100 (9)
	Annual	36	29	32	31	31	32 [64%]	50
FSP	10 th highest 24-hour	57	55	55	47	47	52 [70%]	75 (9)
	Annual	23	20	22	19	20	21 [59%]	35

Note:

[1] N/M - Not Measured.

[2] Number of exceedance allowed under the Air Quality Objective (AQO) is shown in (), % of the AQO is shown in []. The 5-year mean is the average of the yearly maximum.

[3] Monitoring results exceeding the AQO are bolded and underlined.

3.1.5 The 4th highest 10-minute and the 4th highest daily SO₂ levels are well within the corresponding Air Quality Objectives (AQOs).

3.1.6 The 19th highest 1-hour NO₂ levels are ranged from 112 to 142 $\mu\text{g}/\text{m}^3$, which are within the AQO of 200 $\mu\text{g}/\text{m}^3$. The annual NO₂ levels are ranged from 33 to 39 $\mu\text{g}/\text{m}^3$, which are within the AQO of 40 $\mu\text{g}/\text{m}^3$.

3.1.7 CO level was not measured at Tai Po Station.

3.1.8 The 10th highest 8-hour O₃ levels are ranged from 147 to 197 $\mu\text{g}/\text{m}^3$, with an average level of 170 $\mu\text{g}/\text{m}^3$ which exceeds AQOs.

3.1.9 The 10th highest daily RSP levels are observed to decrease from 77 $\mu\text{g}/\text{m}^3$ in 2015 to 65 $\mu\text{g}/\text{m}^3$ in 2019, as compared with the AQO of 100 $\mu\text{g}/\text{m}^3$. The annual RSP levels are also observed to decrease from 36 $\mu\text{g}/\text{m}^3$ in 2015 to 29 $\mu\text{g}/\text{m}^3$ in 2016 and then rise back to 32 $\mu\text{g}/\text{m}^3$ in 2017 and 31 $\mu\text{g}/\text{m}^3$ in 2018 and 2019, which were all within the AQO of 50 $\mu\text{g}/\text{m}^3$.

3.1.10 The 10th highest daily FSP levels are observed to decrease from 57 $\mu\text{g}/\text{m}^3$ in 2015 to 47 $\mu\text{g}/\text{m}^3$ in 2019, as compared with the AQO of 75 $\mu\text{g}/\text{m}^3$. The annual FSP levels are also observed to decrease from 23 $\mu\text{g}/\text{m}^3$ in 2014 to 19 $\mu\text{g}/\text{m}^3$ in 2018 and rise back to 20 $\mu\text{g}/\text{m}^3$ in 2019, which were all within the AQO of 35 $\mu\text{g}/\text{m}^3$.

3.2 Noise

Noise Sensitive Receivers

3.2.1 Noise Sensitive Receiver (NSR) is defined in Annex 13 of the TM-EIAO as “domestic premises, education institution, hospital, medical clinic, homes for the aged, convalescent homes, place of public worship, library, court of law, performing arts centre, auditoria, amphitheatre, hostel and country park”.

3.2.2 Representative NSRs within a distance of 300m from the Project boundary of each SPS have been identified and summarized in **Table 3.3**. They are the first layer of NSRs which include both existing and planned NSRs. Site inspections have been carried out to identify the representative existing NSRs. **Figure 3.2** shows the

locations of these NSRs. Photos of the existing representative NSRs are provided in **Appendix 3.1**.

Table 3.3: Selected Representative NSRs

NSR ID	Description	Use ^[1]	Nearest Upgraded/ New Pumping Station (m)	Distance from the Pumping Station (m)	Figure No.	Selected for Construction Noise Assessment	Selected for Fixed Noise Assessment
Existing NSRs							
N1	House 6C, Tong Fong	R	Ping Che Road Tong Fong SPS	~85	Fig. 3.2a	√	√
N2	House 13, Kan Tau Wai	R	Ping Che Road Tong Fong SPS	~105	Fig. 3.2a	√	√
N3	House 1, Kan Tau Wai	R	Ping Che Road Tong Fong SPS	~155	Fig. 3.2a	√	√
N4	House 190, Sha Ling	R	Man Kam To Road Sha Ling SPS	~120	Fig. 3.2b	√	√
N5	Ping Che Village Office	G/IC	Ping Che Road Kat Tin SPS	~45	Fig. 3.2c	√	√
N6	House 93, Ping Che Kat Tin	R	Ping Che Road Kat Tin SPS	~25	Fig. 3.2c	√	√
N7	Temporary House at Sha Ling	R	Ping Che Road Sha Ling SPS	~35	Fig. 3.2b	√	√
N8	Village House at Sha Ling	R	Ping Che Road Sha Ling SPS	~130	Fig. 3.2b	√	√
Planned NSR							
PN1	Planned Village House at Tong Fong	R	Ping Che Road Tong Fong SPS	~25	Fig. 3.2a	√	√

Note:

[1] R – Residential premises; G/IC – Government, Institution or Community

- 3.2.3** Potential noise impacts during construction phase include noise generated by the demolition/ upgrading/ construction works of the pumping stations. Potential noise impacts during operational phase include fixed noise generated by the upgraded/ new pumping stations.
- 3.2.4** All the above NSRs will be affected by the noise generated by the demolition/ upgrading/ construction works of the pumping stations and other concurrent construction works in the vicinity and have been selected for construction noise assessment.
- 3.2.5** All the above NSRs will be affected by the fixed noise generated by the upgraded/ new pumping stations and other fixed noise sources in the vicinity and have been selected for fixed noise assessment.

Existing Ambient Noise Conditions

- 3.2.6** According to the Ping Che and Ta Kwu Ling OZP (No. S/NE-TKL/14), the existing Ping Che Road Kat Tin SPS is located within an “Agriculture” (“AGR”) zone to the west of Ping Che Kat Tin. The major land use zonings within 300m from the pumping station are “Industrial (Group D)” (“I (D)”), “Village Type Development” (“V”), “Green Belt” (“GB”), “AGR” and “Government, Institution or Community” (“G/IC”). Based on site observation, the noise climate in the vicinity of the site was dominated by road traffic noise along Ping Che Road.
- 3.2.7** According to the Ta Kwu Ling North OZP (No. S/NE-TKLN/2), the existing and new Ping Che Road Tong Fong SPS is located within a “Recreation” (“REC”) zoned area to the north west of village houses at Tong Fong. The major land use zonings within 300m from the existing/ new pumping stations are “REC”, “V”, “GB” and “AGR”. Based on site observation, the noise climate in the vicinity of the site was dominated by road traffic along Ping Che Road.
- 3.2.8** According to the Fu Tei Au & Sha Ling OZP (No. S/NE-FTA/16), the new Man Kam To Road Sha Ling SPS is proposed to be located within a “G/IC” zoned area also to the south west of Border District Police Headquarters. The major land use zonings within 300m from the existing/ new pumping stations are “GB”, “AGR”, “Open Storage” (“OS”) and “G/IC”. Based on site observation, the noise climate in the vicinity of the site was dominated by road traffic along Man Kam To Road.
- 3.2.9** The areas in the vicinity of the SPSs are identified as rural area with village type developments. Neither industrial area nor major road with annual average daily traffic flow of more than 30,000 vehicles is identified in the vicinity of the SPSs. The NSRs are therefore considered to be not affected by the Influencing Factor (IF) and Area Sensitivity Rating of “A” are assigned.
- 3.2.10** Noise measurements were conducted in May and June 2020 in free field condition at locations where it was safe, accessible and as close to the representative NSRs as practicable to establish the prevailing background noise condition of the surrounding environment. The prevailing background noise measurement results are summarized in **Table 3.4** below. Locations, photos and details of the prevailing background noise measurements are shown in **Figure 3.2**.

Table 3.4: Prevailing Background Noise Measurement Results

Measurement Location	Concerned Upgraded/ New Pumping Station	Measured Prevailing Background Noise Level, L ₉₀ (1 hour) dB(A) ^{[1][2]}		
		Daytime	Evening time	Night time
NM1	Ping Che Road Kat Tin SPS	63-66	56	47-57
NM2	Ping Che Road Tong Fong SPS	58-61	56-61	52-60
NM3	Man Kam To Road Sha Ling SPS	71-73	65-66	57-66

Note:

[1] Noise measurements were conducted in free field condition at locations where it was safe, accessible and as close to the representative NSRs as practicable to establish the prevailing background noise condition of the surrounding environment. A +3dB(A) façade correction has been included.

[2] Based on the site survey results, it was determined that noise measurements conducted in May and June 2020 at time periods from 10am to 4pm and 10pm to 4am for 2 days covering weekday and weekend could obtain noise levels which are sufficient to represent the prevailing background noise environment at the concerned areas.

3.3 Water Quality

Water Sensitive Receivers

3.3.1 Water Sensitive Receiver (WSR) is defined in Annex 14 of the TM-EIAO as “areas of ecological or conservation values, areas for abstraction of water for potable water supply, water abstraction for irrigation and aquaculture, fish spawning grounds, beaches and other recreational areas, water abstraction for cooling, flushing and other industrial purposes and areas for navigation/shipping”.

3.3.2 Representative WSRs within a distance of 500m from the Project boundary of each SPS have been identified and summarized in **Table 3.5** and shown in **Figure 3.3**.

Table 3.5: Key Water Sensitive Receivers

WSR	Description	Nearest Upgraded/ New Pumping Station with Emergency Discharge Pipe	Distance from the Nearest Emergency Discharge Locations of Upgraded/ New Pumping Station (m)
WSR 1	Upstream watercourse of Ping Yuen River near Ping Che	Upgraded Ping Che Road Kat Tin SPS ^[1]	~200 ^[1]
WSR 2	Pond near Wun Chuen Sin Kwoon	Upgraded Ping Che Road Kat Tin SPS ^[1]	~290 ^[1]
WSR 3	Upstream watercourse of Ping Yuen River near Sing Ping Village	New Ping Che Road Tong Fong SPS	~340
WSR 4	Ping Yuen River	New Ping Che Road Tong Fong SPS	Emergency discharge location would be at Ping Yuen River
WSR 5	Shenzhen River	New Ping Che Road Tong Fong SPS	~450
WSR 6	Watercourse at Sha Ling	New Man Kam To Road Sha Ling SPS	Emergency discharge location would be at a channelized section of WSR 6
WSR 7	Ponds at the North of Sheung Shui Water Treatment Works	New Man Kam To Road Sha Ling SPS	~180
WSR 8	Watercourse at Table Hill	New Man Kam To Road Sha Ling SPS	~430

Note:

[1] No emergency discharge overflow pipe for Ping Che Road Kat Tin SPS. Distances are measured from the SPS location to the WSRs.

Existing Ambient Water Quality Conditions

3.3.3 Ping Yuen River is the major watercourse within 500m assessment area. It will discharge into Shenzhen River and eventually to Inner Deep Bay, where 3 EPD’s marine water quality monitoring stations are in place (**Figure 3.4**). There is also a river water quality monitoring station at Ping Yuen River.

3.3.4 EPD’s River Water Quality Monitoring Station GR1 is the monitoring station representing the water quality for Ping Yuen River (River Ganges). According to the EPD Report “River Water Quality in Hong Kong” in 2018, the WQO compliance rate for the rivers was 84%.

3.3.5 The latest river water quality monitoring data for the Ping Yuen River (River Ganges) are presented in **Table 3.6** and the location of the monitoring station GR1 is presented in **Figure 3.4**.

Table 3.6: Summary of River Water Quality Monitoring Data for the Ping Yuen River (River Ganges) at station GR1 (2014-2018)

Parameter	Monitoring Station	Concentration ^[1]					Key Water Quality Objectives for watercourses at Deep Bay Water Control Zone
		2014	2015	2016	2017	2018	
DO (mg/L)	GR1	6.9	8.0	7.9	7.4	8.4	Minimum 4
pH	GR1	7.4	7.5	7.3	7.4	7.4	6.5 – 8.5
Suspended Solid (SS) (mg/L)	GR1	7	14	12	8.4	11.0	Maximum 20
BOD ₅ (mg/L)	GR1	6	13	4	3.4	6.6	Maximum 3
COD (mg/L)	GR1	16	21	11	12	16	Maximum 15

Note:

[1] Data presented are in annual medians of monthly samples.

3.3.6 The Project sites are located within the catchment of Deep Bay WCZ and EPD has been operating 3 monitoring stations (Stations DM1 to DM3) within the Inner Deep Bay area.

3.3.7 According to EPD Reports ‘Marine Water Quality in Hong Kong’ in 2018, the compliance level of WQOs at Deep Bay was 53% compared with a ten-year average of 46% in 2008-2017. The total inorganic nitrogen at three Stations DM1, DM2 and DM3 were 2.59, 2.20 and 1.28mg/L respectively and exceeded the WQOs of 0.7 mg/L in Deep Bay WCZ. The inner bay was mostly affected by the discharges from Shenzhen River as well as Kam Tin River, Yuen Long Creek and Tin Shui Wai Nullah from the Hong Kong side. Details of EPD’s marine water quality monitoring at Inner Deep Bay are presented in **Table 3.7** and the locations of monitoring stations are presented in **Figure 3.4**.

Table 3.7: Summary of Marine Water Quality of Deep Bay WCZ (2014-2018)

Parameter	Monitoring Station	Concentration					WQO for Deep Bay WCZ (Inner)
		2014	2015	2016	2017	2018	
Dissolved Oxygen (mg/L)	DM1	3.7	4.5	4.5	4.8	4.5	Not less than 4
	DM2	4.6	5.1	4.9	5.3	5.1	
	DM3	5.5	5.5	5.8	6.4	5.5	
Ammonia Nitrogen (mg/L)	DM1	2.080	1.340	1.961	1.680	0.679	-
	DM2	1.410	0.913	1.324	1.102	0.475	
	DM3	0.536	0.256	0.431	0.200	0.121	
Unionised Ammonia, mg/L (Annual mean)	DM1	0.026	0.016	0.013	0.018	0.007	Not to exceed 0.021
	DM2	0.025	0.019	0.012	0.016	0.005	
	DM3	0.014	0.006	0.006	0.004	0.002	
Nitrite Nitrogen, mg/L	DM1	0.367	0.432	0.388	0.413	0.400	-
	DM2	0.291	0.366	0.300	0.342	0.347	
	DM3	0.184	0.211	0.168	0.166	0.192	
	DM1	1.030	1.069	0.750	0.909	1.513	-

Parameter	Monitoring Station	Concentration					WQO for Deep Bay WCZ (Inner)
		2014	2015	2016	2017	2018	
Nitrate Nitrogen (mg/L)	DM2	0.918	0.940	0.711	0.836	1.378	
	DM3	0.759	0.943	0.831	0.873	0.965	
Total Inorganic Nitrogen, mg/L (Annual mean)	DM1	3.48	2.84	3.10	3.00	2.59	≤0.7
	DM2	2.61	2.22	2.34	2.28	2.20	
	DM3	1.48	1.41	1.43	1.24	1.28	
Total Kjeldahl Nitrogen (mg/L)	DM1	2.78	2.38	3.57	2.80	1.48	-
	DM2	1.94	1.67	2.51	1.78	0.91	
	DM3	0.85	0.61	0.75	0.47	0.37	
Total Nitrogen, mg/L	DM1	4.17	3.88	4.70	4.12	3.39	-
	DM2	3.15	2.98	3.52	2.96	2.64	
	DM3	1.79	1.76	1.75	1.51	1.53	
Orthophosphate Phosphorus (mg/L)	DM1	0.213	0.236	0.244	0.234	0.174	-
	DM2	0.183	0.200	0.212	0.197	0.144	
	DM3	0.093	0.086	0.115	0.085	0.076	
Total Phosphorous (mg/L)	DM1	0.31	0.37	0.40	0.38	0.26	-
	DM2	0.27	0.30	0.36	0.29	0.23	
	DM3	0.13	0.16	0.18	0.13	0.11	
<i>E.coli</i> (cfu/100ml) (Annual geometric mean)	DM1	1300	1800	14000	3300	990	Not to exceed 610
	DM2	380	340	4500	570	380	
	DM3	37	23	140	14	11	
pH	DM1	7.4	7.2	7.1	7.2	7.2	6.5 - 8.5
	DM2	7.5	7.5	7.2	7.4	7.3	
	DM3	7.7	7.7	7.5	7.6	7.4	
Suspended Solids (mg/L)	DM1	46.2	44.1	49.2	43.7	39.9	Waste discharge not to raise the natural ambient level by 30% nor cause the accumulation of suspended solids which may adversely affect aquatic communities
	DM2	23.0	33.3	47.6	28.7	38.7	
	DM3	15.5	11.6	12.2	12.5	16.5	
Salinity (psu)	DM1	15.5	15.2	10.8	12.9	14.5	Change due to waste discharge not to exceed 10% of natural ambient level
	DM2	17.5	16.6	12.1	15.2	16.7	
	DM3	21.2	20.2	17.7	19.9	21.3	

3.4 Landscape and Visual

3.4.1 The new Tong Fong SPS site is located in area adjacent to the Ping Che Road. Its vicinity is characterized by grassland and hillside vegetation cover. Tree cover is scattered and relatively thin, typically common species. The age of the planting ranges from saplings to mature and is generally in fair condition.

3.4.2 The visual envelope is the area from which any part of the proposed works can be seen and fully visible. Given the low rise nature of the proposed SPSs (refer to **Table 3.8a**), key VSR are mapped out in **Figure 3.5, 3.6 and Figure 3.6a**. There would be some potential visual impact on the adjacent Visual Sensitive Receivers (VSRs) in the vicinity of above SPSs. VSRs within the visual envelope are identified and summarized in **Table 3.8**. (refer to **Figures 3.5, 3.6 and Figure 3.6a**). There will be minor upgrading works of existing Ping Che Road Kat Tin SPS. Works include replacement of pumps and internal pipeworks, etc. There will be no demolition nor excavation works in existing Ping Che Road Kat Tin SPS. Impacts arising from the Ping Che Road Tong Fong SPS and Man Kam To Road Sha Ling SPS have been reviewed and it is concluded that the magnitude of impact would be small due to its small scale and localized nature.

Table 3.8a: locations and Development Details of Proposed SPSs.

Locations	Approximate Height and level (mPD) of the Proposed SPSs	Approximate footprint (m ²)
Ping Che Tong Fong	+15.1mPD at top level, 6.5 m above ground	765 sq.m.
Man Kam To Sha Ling	+16.7 mPD at top level, 6.5 m above ground	1,430 sq.m.
Ping Che Kat Tin	Only minor internal upgrading works of existing Ping Che Kat Tin SPS. No external works, no excavation works, no demolition works.	90 sq.m.

Table 3.8: Representative VSRs

VSR ID	Description	Type of VSRs
VSR1	Travelers along Ping Che Road	Travelers
VSR2	Tong Fong Village	Residential
VSR11	Users located in open storage	Workers
VSR12	Travelers along Man Kam To Road	Transportation
VSR21	Travelers along Ping Che Road	Transportation
VSR22	Ping Che Kat Tin	Residential

3.5 Ecology

3.5.1 All of the Project sites have largely been developed and are mostly occupied by some villages and open storages with little ecological value. The wider 500m Study Areas, in general, are dominated by rural environs, including villages, orchards, plantations, woodlands, agricultural areas, as well as grassland and open country habitats

presumably evolved from abandoned farmland. Habitat maps within the boundary of the 500m Study Areas of the SPSs are shown in **Figure 3.12**.

- 3.5.2** Recognized sites of conservation importance within or near the 500m Study Area include the proposed Long Valley Nature Park (LVNP), Man Kam To Road Egretty, Ping Che Egretty and fung shui woodland at Kan Tau Wai. None of the Project Sites encroached into these sites.
- 3.5.3** The immediate environ of the existing Ping Che Road Kat Tin SPS is largely developed and occupied by villages. To the southwest of it is a mosaic of grassland and farmland, with a semi-natural watercourse which drains into the channelized Ping Yuen River. Small patches of woodland are located to the northeast of the existing Ping Che Road Kat Tin SPS, while the Ping Che Egretty is located to the southeast in approximately 360m.
- 3.5.4** The new Ping Che Road Tong Fong SPS is located next to Ping Che Road, between two upper stretches of Ping Yuen River in the east and the south, and its lower, major channelised section in the west. The Project Site overlaps with the existing Ping Che Road Tong Fong SPS and sits on top of a channelised section of Ping Yuen River. The vicinity is mainly covered by grassland habitat, with a stand of orchard and secondary woodland to the southeast. The Kan Tau Wai fung shui woodland is located approximately 150m to the northeast of Ping Che Road Tong Fong SPS.
- 3.5.5** The new Man Kam To Road Sha Ling SPS is located next to Kong Nga Po Road and Man Kam To Road. Whilst the area immediately next to the Project Site has been developed and occupied by open storages, the eastern side is largely covered by hillside grassland and plantation or secondary woodland. A large agricultural area with active farmland and fishponds is located to the east across the Man Kam To Road. The Man Kam To Road Egretty is located to the southeast near Ng Tung River, approximately 700m away from the proposed Man Kam To Road Sha Ling SPS. The proposed LVNP is located roughly 1,300m southwest to the proposed SPS.

3.6 Cultural Heritage

- 3.6.1** A study area comprising the works area and 200m from the works boundary was adopted for this study. The project works include upgrading and construction of SPS which are relatively discrete within a single area.
- 3.6.2** The majority of the works will occur in area without archaeological potential or areas with major existing impacts. The works are at sufficient distance, i.e. Ping Che Road Kat Tin SPS works are located at ~400m from Ping Che Site of Archaeological Interest (SAI) and new Ping Che Road Tong Fong SPS works at ~80m from an area of known archaeological potential at Tong Fong, and will not affect the SAI or similar deposits of possible archaeological potential nearby. The Ping Che SAI and the area of known archaeological potential at Ping Che Road Tong Fong are shown in **Figure 3.13**. Furthermore, the location, geology, and topography of find location of a single ceramic jar (recorded during the archaeological monitoring works for Northeast New Territories Village Sewerage in 2005 (AAL 2005)) near Tong Fong is very different from the SPS relocation site which is located on Holocene alluvium close to a perennial stream. The Man Kam To Road Sha Ling SPS is proposed in an area previously disturbed by site formation and has no archaeological potential.

3.6.3 The proposed works are located within 200m from the following identified built heritage site, Wing Kit Study Hall in Tong Fong (Grade 3) which is located at 120m from new Ping Che Road Tong Fong SPS works (shown in **Figure 3.13a**). There are no built heritage sites within the study area of Ping Che Road Kat Tin SPS (shown in **Figure 3.13b**) and Man Kam To Road Sha Ling SPS (shown in **Figure 3.13c**).

3.7 Land Contamination

3.7.1 A site appraisal, comprising desktop review and site walkover, has been carried out to identify the current and historical land uses which may have potential for causing land contamination at the Project sites.

Review of Aerial Photographs and Historical Land Use

3.7.2 Historical aerial photos are shown in **Appendix 3.2** and a summary of findings in the historical aerial photos are tabulated in **Table 3.10** below.

Table 3.10: Summary of Historical Land Uses

Year	Land Use at the New Ping Che Road Tong Fong SPS	Land Use at the New Man Kam To Road Sha Ling SPS	Land Use at the Upgraded Ping Che Road Kat Tin SPS
1973	The natural Ping Yuen River and vegetation were observed.	Vacant land was observed.	Grassland with trees was observed.
1982	A portion of the site was occupied by vacant land. No other significant change in historical land use was observed as compared with Year 1973.	Agriculture land was observed to be the dominant land use in the surrounding. Road and temporary structures used for storage of agriculture-related materials and equipment were observed. No apparent contaminating land uses were identified.	Grassland was observed.
1993	The existing Ping Che Road Tong Fong SPS was under construction. The natural Ping Yuen River and vegetation were still observed.	Land for open carpark and material storage was observed to be the dominant land use in the surrounding. Temporary structures used for construction material storage were observed. No apparent contaminating land uses were identified.	The existing Ping Che Road Kat Tin SPS was under construction.
2004	The existing Ping Che Road Tong Fong SPS was under operation. The natural Ping Yuen River and vegetation were still observed.	Temporary structures (i.e. DSD site office) with vehicle parking area were observed.	The existing Ping Che Road Kat Tin SPS was under operation.
2015	The existing Ping Che Road Tong Fong SPS was under operation. The tributary of Ping Yuen River was channelized with trees removed along sides.	No significant change in historical land use was observed as compared with Year 2004.	No significant change in historical land use was observed as compared with Year 2004.
2018	No significant change in historical land use was observed as compared with	No significant change in historical land use was observed as compared with	No significant change in historical land use was observed as

Year	Land Use at the New Ping Che Road Tong Fong SPS	Land Use at the New Man Kam To Road Sha Ling SPS	Land Use at the Upgraded Ping Che Road Kat Tin SPS
	Year 2015.	Year 2004.	compared with Year 2004.

3.7.3 Historical aerial photos show that the Project site for the new Ping Che Road Tong Fong SPS was mainly occupied by the tributary of Ping Yuen River and vegetation from Year 1973 to Year 1993. The existing Ping Che Road Tong Fong SPS have been observed at the Project site since Year 1993. Historical aerial photos also indicate that the previous land use at the Project site for the upgraded Ping Che Road Kat Tin SPS prior to the occupation of the existing Ping Che Road Kat Tin SPS was mainly grassland. It can be seen from the historical aerial photos that temporary structures have been observed at the Project site for the new Man Kam To Road Sha Ling SPS since Year 1982.

Information from Relevant Government Departments

3.7.4 Information request letters were sent to EPD and Fire Services Department (FSD) on 6 February 2020 to identify the past and present records of chemical spillage/leakage accident as well as dangerous goods (DG) and incidents records within the whole study area of Part 1 – NENT Sewerage System Update, which includes the Project sites.

3.7.5 Reply from FSD was received on 23 June 2020 and 20 October 2020 which advised that above ground DG storages were found at the Shek Wu Hui Effluent Polishing Plant/ Shek Wu Hui Sewage Treatment Works (i.e. Category 2 DG – 36 Cylinders, Category 4 DG – 4,000L and Category 5 – 1,500L). No DG storage and incident record were found within the Project sites. Correspondence with FSD is shown in **Appendix 3.3**.

3.7.6 Reply from EPD was received on 3 March 2020 which advised that no chemical spillage / leakage accident report was recorded in the area within the Project Boundary. Correspondence with EPD is shown in **Appendix 3.4**. The records of chemical waste producer (CWP) registration were reviewed at EPD office on 23 October 2020. No record of CWP registration was found within the Project sites.

Site Inspection Records

3.7.7 Site surveys were conducted in October to December 2015, March 2018, March 2019, and May to June 2020 to ground truth the findings of the desktop review and to identify any other land uses at the Project sites which may have potential to cause land contamination. Possible contaminants, if any, would be identified in accordance with EPD's Practice Guide for Investigation and Remediation of Contaminated Land. Photo records of the site surveys and the site walkover checklist are provided in **Figure 3.14** and **Appendix 3.5** respectively.

3.7.8 It was revealed through the site inspections that the Project site for the new Ping Che Road Tong Fong SPS was mainly occupied by the tributary of Ping Yuen River, vegetation and the existing Ping Che Road Tong Fong SPS. The Project site for the upgraded Ping Che Road Kat Tin SPS was occupied by the existing Ping Che Road Kat Tin SPS. The Project site for the new Man Kam To Sha Ling SPS was occupied by DSD site office.

Potential Contamination Issues

- 3.7.9** No potentially contaminated land uses were identified at the Project sites for the new Ping Che Road Tong Fong SPS and the upgraded Ping Che Road Kat Tin SPS prior to the construction and operation of the existing Ping Che Road Tong Fong SPS and Ping Che Road Kat Tin SPS based on the historical aerial photos.
- 3.7.10** During site surveys, chemical storages/ transformers were not observed within the works area at the existing Ping Che Road Tong Fong SPS and Ping Che Road Kat Tin SPS. Control panel, wet well, dry well and valve chamber were observed at the SPSs during the site surveys which have no land contaminating potential. Emergency generators were also observed at the SPSs during the site surveys. The emergency generators would only be used during emergency situation, and all of them were located on concrete-paved ground with no observable cracks. In addition, maintenance activities would be conducted at the SPSs which might use chemical (mainly lubricant oil and paints). Nevertheless, negligible amount of chemical might be used only during the maintenance activities, and the SPS areas were paved with concrete with no observable cracks. Therefore, potential land contamination issue at the Project sites for the new Ping Che Road Tong Fong SPS and the upgraded Ping Che Road Kat Tin SPS are not anticipated.
- 3.7.11** Temporary structures were observed at the Project site for the new Man Kam To Road Sha Ling SPS since Year 1982. As agriculture land was observed to be the dominant land use in the surrounding of the Project site for the new Man Kam To Road Sha Ling SPS from the Year 1982 aerial photo, it was likely that the temporary structures were used for storage of agriculture-related materials and equipment. No apparent land contaminating land use was identified from the Year 1982 aerial photo. As land for open carpark and construction material storage was observed to be the dominant land use in the surrounding of the Project site for the new Man Kam To Road Sha Ling SPS from the Year 1993 aerial photo, it was likely that the temporary structures were used for construction material storage. No apparent contaminating land uses were identified from the Year 1993 aerial photo.
- 3.7.12** Based on the information provided by the Lands Department (LandsD), the Project site for the new Man Kam To Road Sha Ling SPS was occupied by the Highways Department (HyD) as works area (i.e. site office/ construction material storage) for the project “Reconstruction of Man Kam To Road near San Uk Ling” from Year 1996 till Year 2000. As requested by LandsD, HyD had reinstated the site appropriately in a condition to the satisfaction of LandsD prior to the handover of the site to LandsD. DSD has occupied the Project site for the new Man Kam To Road Sha Ling SPS right after the return of the site from HyD to LandsD. Based on the findings from the historical aerial photos and site surveys, DSD site office was observed to be located within the proposed site since 2004. The site, which consisted of a 2-storey temporary office structure and an open carpark, was observed to be in good condition with the whole area paved with concrete. Therefore, potential land contamination issue at the Project site for the new Man Kam To Road Sha Ling SPS is not anticipated.

4 Possible Impacts on the Environment

4.1 Air Quality

Construction Phase

- 4.1.1** Dust generated from demolition of the pumping station as well as construction activities such as earth works, trench support and ground compaction, concrete building works, backfilling and surfacing works could affect ASRs in the vicinity. The nearest ASR to the Project site for the new Ping Che Road Tong Fong SPS (covering the footprint of the existing Ping Che Road Tong Fong SPS in which demolition works will take place) is PA1, which is ~25m away from the SPS. The nearest ASR to the Project site for the new Man Kam To Road Sha Ling SPS is A18, which is ~35m away from the SPS. The nearest ASR to the Project site for the upgraded Ping Che Road Kat Tin SPS is A12, which is ~25m away from the SPS. However, the potential impact would be short-term and limited and could be well controlled through dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation of the Air Pollution Control Ordinance (APCO) and good site practices (see **Section 5.1**). Potential impact on surrounding ASRs will be controlled and minimized by implementing suitable good site practice and statutory mitigation measures. Therefore, adverse construction dust impacts are not anticipated.
- 4.1.2** Best practices would be implemented to minimize and properly control dust emissions from the concurrent projects in close vicinity of the Project sites. In addition, the upgraded/ new pumping stations would have relatively small and localized works areas. Therefore, with the implementation of proper dust control measures, cumulative dust impacts with other concurrent projects are expected to be limited.
- 4.1.3** Fuel combustion from the use of Powered Mechanical Equipment (PME) during construction works could be a source of Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂) and Carbon Monoxide (CO). To improve air quality and protect public health, EPD has introduced the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, which came in effect on 1 June 2015, to regulate emissions from machines and non-road vehicles. Starting from 1 December 2015, only approved or exempted non-road mobile machinery are allowed to be used in construction sites. Hence, with the effect of the Regulation, the emissions from PMEs are considered relatively small as compared with the tailpipe emissions from vehicles and adverse cumulative impacts would be considered unlikely. SO₂ emission is not controlled under the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation. To minimize SO₂ emission from construction plants and equipment, requirements stipulated in the Air Pollution Control (Fuel Restriction) Regulation (using liquid fuel with a sulphur content of less than 0.005% by weight) would be fulfilled. Moreover, to further minimise the emission from construction plants, the construction should consider using electricity instead of fuel powered generators, where practicable.

Operational Phase

- 4.1.4** According to the current infrastructure design, the upgraded/ new pumping stations would have design Average Dry Weather Flow (ADWF) of up to 11,032m³/day and the shortest separation distance between the pumping stations and ASRs would be ~25m. The septic sewage, sewer vents, air release valves and wet wells of the upgraded/ new pumping stations as well as the screening waste generated from the

operation of the upgraded/ new pumping stations would be the odour sources to the nearby ASRs during operational phase. The following mitigation measures would be provided such that potential odour impact to surrounding ASRs can be controlled:

- enclosure of odourous facilities;
- storage of screening waste in enclosed containers;
- maintaining negative pressure to prevent foul air from flowing out; and
- provision of deodourising units of at least 99.5% odour removal efficiency at the exhaust vent.

4.1.5

A desktop review has been conducted to compare against other committed SPSs which have similar or greater designed capacities and have shorter separation distances with their respective identified ASRs than that of the upgraded/ new pumping stations proposed under this Project. 3 committed SPSs have been selected (including Tung Chung East (TCE) West SPS, Cherry Street Box Culvert SPS and the upgraded Ting Kok Road No.5 SPS) for comparison. The existing Man Kam To Sha Ling LPS has also been selected for comparison as it shares the same surrounding environment with the upgraded/ new pumping stations under this Project and could serve as good reference. Summary of the comparison is shown in **Table 4.1**.

Table 4.1: Summary Table of Committed SPSs and Existing LPS

Feature	Tung Chung East (TCE) West SPS (EP-519/2016)	Cherry Street Box Culvert SPS (EP-523/2016)	Upgraded Ting Kok Road No. 5 SPS (EP-554/2018)	Existing Man Kam To Sha Ling LPS	Upgraded/ New Pumping Stations under this Project
ADWF	12,891m ³ /day	43,200m ³ /day	21,200m ³ /day	4,500 m ³ /day	11,032 m ³ /day ^[1]
Shortest separation distance with nearest ASR	10m	10m	13m	30m	25m ^[2]
Enclosure of odourous facilities	Yes	Yes	Yes	No	Yes
Odour removal efficiency of deodourising units	At least 95%	At least 99.5%	At least 99.5%	No deodourising unit is identified	At least 99.5%

Note:

[1] The maximum design ADWF among the 3 upgraded/ new pumping stations is presented.

[2] The shortest separation distance with nearest ASR for the 3 upgraded/ new pumping stations is presented.

4.1.6

It can be seen from the above table that all 3 committed SPSs are equipped with similar or higher capacities and having even shorter separation distances with their identified ASRs than that of the upgraded/ new pumping stations proposed under this Project. Notwithstanding the above, all 3 committed SPSs are installed with equivalent odour removal efficiencies (i.e. at least 95%) at their deodourising units and implemented with similar mitigation measures as stated in **Sections 5.1.3 - 5.1.5**. All related studies

of these SPSs indicate that potential odour impacts generated could be properly controlled and no adverse odour impacts would be anticipated. Hence, with regards to the committed SPSs as listed above, adverse odour impacts would also not be anticipated at the upgraded/ new pumping stations proposed under this Project with the implementation of mitigation measures as stated in **Sections 5.1.3 - 5.1.5**.

4.1.7 In addition, it can be seen from **Table 4.1** that although the existing Man Kam To Sha Ling LPS has a smaller ADWF than that of the upgraded/ new pumping stations under this Project, it has similar shortest separation distance from nearest ASR and limited odour control installations (i.e. no enclosure for odourous facilities and no deodourising unit) as compared with that of the upgraded/ new pumping stations. Nevertheless, as advised by DSD, no complaint/ non-compliance record has been received/ revealed for the existing Man Kam To Sha Ling LPS in the recently 3 years (i.e. 2018 to 2020). Therefore, this further supports that adverse odour impacts would also not be anticipated at the upgraded/ new pumping stations proposed under this Project with the implementation of mitigation measures as stated in **Sections 5.1.3 - 5.1.5**.

4.2 Noise

Construction Phase

4.2.1 Construction noise generated from the use of powered mechanical equipment (PME) during demolition of the pumping station as well as construction activities such as earth works, trench support & ground compaction, concrete building works, backfilling and surfacing works could affect NSRs in the vicinity. However, the potential impact would be short-term and limited and could be well controlled to within relevant standards by implementing suitable good site practice and mitigation measures (see **Section 5.2**). No construction activity is expected during restricted hours (i.e. the time between 1900 and 0700 hours on all days, and any time on general holidays, including Sundays). A Construction Noise Permit is required under the Noise Control Ordinance (NCO) in case the construction works are to be carried out during restricted hours.

4.2.2 Annex 5 of the TM-EIAO stipulates the noise standards for daytime construction activities as shown in **Table 4.2** below.

Table 4.2: Noise Standards for Daytime Construction Activities

Uses	Noise Standards ^{[1][2]} , L_{eq} (30 mins) dB(A)
	0700 to 1900 hours on any day not being a Sunday or general holiday
All domestic premises including temporary housing accommodation	75
Hotels and hostels	75
Educational institutions including kindergartens, nurseries and all others where unaided voice communication is required	70 65 (During examinations)

Notes:

[1] The above standards apply to uses that rely on opened windows for ventilation.

[2] The standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

4.2.3 Typical types, numbers, % on time and Sound Power Levels (SWLs) of PME needed for various construction activities have been assigned as shown in **Appendix 4.1**. They

have been reviewed and concluded by project engineer to be practical for the purpose of this Project Profile. PME that will likely be used concurrently have been grouped within the same works stage. Construction noise levels at the representative NSRs were calculated following the methodology outlined in the Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM) issued under the NCO (Cap. 400).

4.2.4 Construction noise impacts from the installation works for sewer and the upgrading works for pumping stations which are not DP (e.g. the upgrading works for the existing Lin Ma Hang Road LPS to Lin Ma Hang Road SPS) have also been taken into account in the calculation of cumulative construction noise impact at representative NSRs as shown in **Appendix 4.2**.

4.2.5 As confirmed with project engineer, the construction/ upgrading works for the pumping stations and installation works for sewer would be carried out concurrently, while the demolitions works for existing pumping station would not be carried out concurrently with either the construction/ upgrading works for the pumping stations or installation works for sewer. As such, potential noise impacts from the overlapping of the construction/ upgrading works for the pumping stations and installation works for sewer were reviewed. Although the construction/ upgrading works for pumping stations and installation works for sewer would be conducted concurrently, the work stages of the construction/ upgrading works for pumping stations and installation works for sewer would not necessarily be conducted concurrently.

4.2.6 The cumulative construction noise impacts have been reviewed. The predicted cumulative construction noise levels under both unmitigated and mitigated scenarios are summarized in **Table 4.3**. Details of the cumulative unmitigated and mitigated construction noise calculation are presented in **Appendix 4.2**.

Table 4.3: Summary of Cumulative Construction Noise Levels at Representative NSRs

NSR ID	Description	EIAO-TM Noise Criteria, L_{eq} (30 mins), dB(A)	Predicted Maximum Unmitigated CNLs, dB(A)	Predicted Maximum Mitigated CNLs, dB(A)
Existing NSRs				
N1	House 6C, Tong Fong	75	79	65
N2	House 13, Kan Tau Wai	75	79	64
N3	House 1, Kan Tau Wai	75	82	65
N4	House 190, Sha Ling	75	84	70
N5	Ping Che Village Office	75	86	69
N6	House 93, Ping Che Kat Tin	75	88	72
N7	Temporary House at Sha Ling	75	86	74
N8	Village House at Sha Ling	75	78	63
Planned NSR				
PN1	Planned Village House at Tong Fong	75	90	75

4.2.7 Results reveal that the predicted cumulative mitigated construction noise levels at all representative NSRs would comply with the EIAO-TM noise criteria with the implementation of mitigation measures mentioned in **Section 5.2**.

Operational Phase

4.2.8 The operation of the upgraded/ new pumping stations (e.g. operation of the electrical and mechanical equipment including sewage pumps and exhaust fans of deodourising

unit) would constitute potential fixed noise sources on nearby NSRs, and hence the potential fixed noise impacts have been addressed.

4.2.9 Operational noise from fixed noise sources is controlled under the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM). To plan for a better environment, the EIAO-TM has specified the following requirements, whichever is more stringent:

- 5dB(A) below the appropriate ANLs in the IND-TM; or
- The prevailing background noise levels.

4.2.10 As mentioned in **Section 3.2.9**, Area Sensitivity Rating of “A” are assigned for the representative NSRs. The appropriate Acceptable Noise Levels (ANLs) for NSRs with Area Sensitivity Rating of “A” at different time periods are summarized in **Table 4.4** below:

Table 4.4: ANLs during Operational Period

Time Period	ANLs, dB(A)
Day (0700 to 1900 hours)	60
Evening (1900 to 2300 hours)	
Night (2300 to 0700 hours)	50

4.2.11 As mentioned in **Section 4.2.9**, the fixed noise standard for the pumping stations will be either ANL-5 dB(A) or the prevailing background noise level, whichever is lower.

4.2.12 Since the pumping stations are assumed to operate at the same loading throughout the day, it is obvious that the daytime and evening time noise standards will be met if the night time standard is met. For the upgraded Ping Che Road Kat Tin SPS, new Ping Che Road Tong Fong SPS and Man Kam To Sha Ling SPS, since the night time ANL-5 dB(A) (i.e. 45 dB(A)) is lower than the lowest measured prevailing background noise level (i.e. 47 dB(A), 52 dB(A) and 57 dB(A) respectively) as shown in **Table 4.5**, the noise criterion of 45 dB(A) will be adopted.

Table 4.5: Determination of Noise Criteria for Fixed Noise Assessment

Nearest Upgraded/ New Pumping Station (m)	Lowest Measured Prevailing Background Noise Level, dB(A)	ASR Rating	Night time ANL-5, dB(A) ^[2]	Noise Criteria, dB(A)
Ping Che Road Kat Tin SPS	47	A ^[1]	45	45
Ping Che Road Tong Fong SPS	52	A ^[1]	45	45
Man Kam To Road Sha Ling SPS	57	A ^[1]	45	45

Note:

[1] Rural area not affected by Influencing Factors (IFs).

[2] Night time ANL-5 dB(A) is adopted for conservative comparison.

4.2.13 In order to meet the noise criteria, the maximum permissible SWL at source (i.e. pumping station) is calculated based on the shortest measured distances to the NSRs and has facade effect taken into account.

4.2.14 **Table 4.6** summarizes the maximum permissible SWLs calculated at the pumping stations. The maximum permissible SWLs are calculated by the noise criteria plus distance correction between NSR to the notional noise source of the pumping station minus the facade correction, tonal correction and correction for cumulative impacts with other pumping stations if applicable. Details of the calculation of maximum permissible SWLs are presented in **Appendix 4.3**.

Table 4.6: Maximum Permissible SWLs of the Pumping Stations during the Operational Phase

Upgraded/ New Pumping Station	Maximum Permissible SWL, dB(A)
Ping Che Road Kat Tin SPS	72
Ping Che Road Tong Fong SPS	72
Man Kam To Road Sha Ling SPS	75

4.2.15 With the adoption of the calculated maximum permissible SWL at source through implementation of proposed mitigation measures in **Section 5.2**, compliance of the noise criteria will be achieved at the NSRs, and adverse noise impact is not anticipated during the operational phase. Upon review of the approved Kai Tak Development EIA report (AEIAR-130/2009), it is practical for SPS to have maximum permissible SWL of as low as 61dB(A) with the provision of silencers or acoustics treatment for all ventilation fans in the SPSs. Therefore, the proposed maximum permissible SWLs (i.e. 72dB(A) to 75dB(A)) of the upgraded/ new pumping stations in this Project are all practical to achieve with the provision of suitable noise mitigation measures.

4.2.16 The contractor should review and implement the maximum permissible SWLs as appropriate to ensure compliances with the noise standards stipulated in the EIAO-TM and NCO for the fixed plant operations. The contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project to ensure compliance of the stipulated noise levels.

4.3 Water Quality

Construction Phase

4.3.1 Potential impacts would arise from surface runoff and erosion soil, earthworks and stockpiles during storm events. Surface runoff may also be generated from construction activities such as dust suppression sprays, dewatering during excavation and washing of construction equipment. Wastewater and site runoff generated from construction activities will be properly pre-treated prior to discharge to stormwater drains.

4.3.2 The construction works at Ping Che Road Kat Tin SPS would only involve minor upgrading works, which include replacement of pumps or provision of dual power supply, etc. No major excavation works / earthworks / civil works would be anticipated for this pumping station. Hence, adverse water quality impact is considered not likely during the upgrading works for this pumping station.

- 4.3.3 However, the demolition of the existing Ping Che Road Tong Fong SPS and the construction of new Ping Che Road Tong Fong SPS and new Man Kam To Road Sha Ling SPS would require site clearance, site formation works and other infrastructural works. Construction of two new pumping stations will be carried out by typical bottom up method.
- 4.3.4 In particular, the site formation works of the new Ping Che Road Tong Fong SPS would require the filling of a low-flow channel at Ping Yuen River (i.e. WSR4). The existing flow would be diverted to the counter high-flow channel, hence the downstream water flow of Ping Yuen River would not be affected. The existing water flow at the low-flow channel would be diverted prior to the commencement of site formation works in order to avoid site runoff discharging into Ping Yuen River as a consequent. The scale of the diversion works is minor and water quality impact during the diversion works will be minimized.
- 4.3.5 The proposed works affecting Ping Yuen River will be confined to its existing low flow channel only, while the main drainage channel will remain in full operation throughout the construction period. The reprovisioned box culvert with the higher hydraulic capacity will be constructed before the any disturbance to existing low flow channel. While the relevant construction works is anticipated to be carried out during dry season only which the low flow channel would be utilized, this arrangement would ensure the conveyance of low drainage flow in Ping Yuen River is maintained at all time.
- 4.3.6 For the new Man Kam To Road Sha Ling SPS, the site formation works would be land based and of limited site area (i.e. Around 1,000m²), only very limited amount of surface runoff would be generated during the construction period.
- 4.3.7 Mitigation measures would also be implemented at the construction of these two SPSs to minimise the site runoff to nearby WSRs. Excavation with cofferdam will be constructed for foundation and the superstructure. No adverse water quality impact upon watercourses, including Deep Bay which Ping Yuen River would eventually discharge to, is anticipated from construction of the Project given the implementations of mitigation measures.
- 4.3.8 Several interfacing projects, which include upgrading works for pumping stations which are not DP as well as the installation of sewer, would be carried out within 500m assessment area from the Project sites. However, given that the scale of the interfacing projects (i.e. upgrading works for the existing Lin Ma Hang LPS to convert it to SPS as well as installation of sewer) is small and the proposed sewers would be conducted by trenchless method as far as possible, cumulative impacts during construction phase of the Project would be minimal. Furthermore, best practices stipulated in ProPECC PN 1/94 and ETWB TC5/2005 as shown in **Section 5.3.1** would be strictly followed, adverse cumulative impacts are considered unlikely.

Operational Phase

- 4.3.9 The upgraded/ new pumping stations are designed to collect sewage generated from nearby village areas / committed developments. The collected wastewater would then be pumped to Shek Wu Hui Sewage Treatment Works (SWHSTW) for treatment. Hence no adverse water quality impact is anticipated during normal operations.
- 4.3.10 Consideration will be given to possible types of emergency situations such as pump and prolonged power supply failure. As a result of such occurrences, the sewage may

flow uncontrolled to the villages, ponds, and watercourses including Ping Yuen River, and watercourses along Ping Che Road, Man Kam To Road and pollute the area. Nevertheless, with the incorporation of adequate precautionary measures / mitigation measures into the design of the pumping station (see **Section 5.3.3**), it is expected the likelihood of emergency sewage bypass will be remote.

4.3.11 As mentioned in **Section 1.6.2**, the new Ping Che Road Tong Fong SPS would encroach the channelized tributary of Ping Yuen River, which is a drainage channel that discharges into Deep Bay within 300m from environmental sensitive receivers including the Mai Po Marshes SSSI and conservation area at Mai Po. However, the Project would construct a new 20m long 3.5m(W) x 3m(H) drainage box culvert to replace the existing engineered concrete low-flow channel. No additional discharge and significant change in water flow would be anticipated for the channelized tributary of Ping Yuen River.

4.4 Waste

Construction Phase

4.4.1 The types of waste generated from construction activities include construction and demolition (C&D) materials, chemical waste, general refuse etc. C&D materials include both inert C&D materials, such as excavated soil, rock and artificial hard materials (AHM), and non-inert C&D materials, such as top soil, vegetation and wood formwork. No sediment is anticipated to be generated from the construction activities. The volume of different types of waste that may be generated from demolition/upgrading/ construction of the pumping stations will be minimized as much as practicable. A summary of construction waste arising from the works area with recommendation for outlets is presented in **Table 4.7**. With the implementation of the mitigation measures presented in **Section 5.4**, adverse environmental impacts arising from the storage, handling and transportation of C&D materials and other wastes are not anticipated.

Table 4.7: Summary of Waste Arising with Recommendation for Outlets during Construction Phase

Activities	Waste Type		Total Amount Generated, m ³	Total Amount Reused, m ³		Total Amount Disposed, m ³	Recommended Outlets
				On-site	Off-site		
Demolition of existing pumping station (i.e. existing Ping Che Road Tong Fong SPS)	Inert C&D Materials [1][5]	Artificial Hard Materials [4]	~100	0	~100	0	Transport to Tuen Mun Area 38 Fill Bank for off-site reuse
	Non-inert C&D Materials [2][5]	Top Soil	~5	0	0	~5	Disposal to NENT Landfill
		Vegetation	~5	0	0	~5	Disposal to NENT Landfill
Construction of new pumping stations (i.e. new Ping Che Tong)	Inert C&D Materials [1][5]	Inert Soft C&D Materials [3][5]	~5,900	~500	~5,400	0	Re-use as backfill for some excavated soft C&D materials [7]. Transport to Tuen Mun Area 38 Fill Bank for off-site reuse for the rest.

Activities	Waste Type		Total Amount Generated, m ³	Total Amount Reused, m ³		Total Amount Disposed, m ³	Recommended Outlets
				On-site	Off-site		
Fong SPS, new Man Kam To Sha Ling SPS)		Artificial Hard Materials ^{[4][5]}	~120	0	~120	0	Transport to Tuen Mun Area 38 Fill Bank for off-site reuse
	Non-inert C&D Materials ^{[2][5]}	Top Soil ^[5]	~170	0	0	~170	Dispose to NENT Landfill
		Vegetation ^[5]	~20	0	0	~20	Dispose to NENT Landfill
		Wood Formwork ^[6]	~5,400	0	~100	~5,300	Re-use on-site as far as practicable and eventually dispose to NENT Landfill. Opportunities for off-site reuse will be further explored by the contractor.
Minor upgrading of pumping station (i.e. Ping Che Kat Tin SPS)	Inert C&D Materials ^{[1][5]}	Inert Soft C&D Materials ^{[3][5]}	~25	~5	~20	0	Re-use as backfill for some excavated soft C&D materials ^[8] . Transport to Tuen Mun Area 38 Fill Bank for off-site reuse for the rest.
	Non-inert C&D Materials ^{[2][5]}	Top Soil ^[5]	~5	0	0	~5	Dispose to NENT Landfill
General Construction Activities	Chemical Waste ^[7]		Few hundred litres / kilograms per month	Few hundred litres / kilograms per month			Collect by licensed chemical waste collectors
	General Refuse		91 kg/day ^[9]	36 kg/day	55 kg/day		Dispose to NENT Landfill
	Paper, Metals, Plastics etc.						

Notes:

- [1] “Inert C&D Materials”, also known as public fill, includes debris, rubble, earth and concrete which is suitable for land reclamation and site formation.
- [2] “Non-inert C&D Materials” includes bamboo, timber, top soil, vegetation, wood formwork, packaging waste and other organic materials. In contrast to public fill, non-inert waste is not suitable for land reclamation and subject to recovery of reusable/ recyclable items, is disposed of at landfills.
- [3] “Inert Soft C&D Material” mainly refers to excavated soil, etc.
- [4] “AHM” includes, but not limited to, broken concrete, asphalt, bitumen, granular materials, debris, and rubble, etc.
- [5] Volume of top soil, inert soft C&D materials, AHM and vegetation are in-situ volume. Bulk factor of AHM is 1.25. Bulk factor of top soil, inert soft C&D materials and vegetation are 1.11.
- [6] Opportunities to reduce timber formwork have been considered. Trenchless construction has been adopted in several locations to reduce the amount of temporary works to be carried out and hence reduce the use of timber formwork. The formwork will be re-used on-site as far as practicable and eventually disposed to NENT Landfill. Opportunities for off-site reuse of the formwork will be further explored by the contractor.

- [7] Chemical waste measured by volume (litres) includes spent hydraulic oil & waste fuel, spent lubrication oil & cleaning fluids, and spent solvent. Scrap batteries are measured by weight (kilograms).
- [8] Reuse of excavated soft C&D materials on-site is limited since only small area at the Project sites would require backfilling.
- [9] The estimation is based on the assumptions of 140 staff to be employed for the Project and a generation rate of 0.65 kg/person/day.

Operational Phase

- 4.4.2** The main types of waste to be generated from the operation of the upgraded/ new pumping stations include screening waste and chemical waste. Sewage would be sieved through mechanical screens to prevent pump damages by large objects and outage of pumping system. It is estimated that a small quantity (~1m³/day) of screening waste would be generated from the upgraded/ new pumping stations with reference to the records of other existing SPSs of similar scale. Chemical waste (mainly lubricant oil and paints) would also be generated from the maintenance of the upgraded/ new pumping stations but the expected quantity is estimated to be a few litres per month only, which is negligible. The screening waste will be collected by operator and disposed to NENT Landfill. The chemical waste, if any, will be collected by a licensed chemical waste collector. They will be recycled at an appropriate facility as far as possible, while chemical waste that cannot be recycled should be disposed at either Chemical Waste Treatment Centre (CWTC), or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. With the mitigation and control requirements presented in **Section 5.4**, adverse environmental impacts are not anticipated.

4.5 Landscape and Visual

Construction Phase

- 4.5.1** The Ping Che Tong Fong SPS and Man Kam To Sha Ling SPS will inevitably result in some landscape and visual impacts arising from the proposed works during construction phase, namely:
- Site clearance works involving the removal of existing vegetation;
 - Excavation works;
 - Material stockpiling;
 - Importation and storage of construction equipment and plant; and
 - Night lighting.
- 4.5.2** These impacts have been minimized through careful consideration of proposed engineering design, minimization of works areas, incorporation of aesthetic external designs and landscape treatments of proposed infrastructural works. Proposed SPS will seek DSD VCAB's advise as per DSD technical Circular No. 3/2015 – Vetting committee on Aesthetic Design of drainage services building, and shall be in accordance with the DSD “Guidelines on Aesthetic Design of Pumping Station Buildings”.
- 4.5.3** There are only 1 nos. of existing trees would be inevitably affected by the proposed Ping Che Road Tong Fong SPS (excluding trees of undesirable species). Affected tree

species is *Microcos nervosa* (refer to **Figure 3.8**), which is a common species. In accordance with DEVB TCW No. 4/2020, as far as possible, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of number, i.e. the number of compensatory trees shall not be lower than that of the number of trees to be removed including dead trees, but excluding trees of undesirable species. To achieve a 1:1 compensatory ratio in terms of removed tree numbers, total 1 number of compensatory trees (heavy standard trees) are proposed within the proposed Ping Che Road Tong Fong SPS planting area (refer to **Figure 4.1** for the location of compensation tree location).

4.5.4 There will be minor upgrading of Ping Che Road Kat Tin SPS, in which works include replacement of pumps, and replacement of internal pipeworks, as well as provision of standby pump, etc. It is anticipated that there will be negligible magnitude of change and insubstantial residual landscape and visual impacts during the construction phase.

4.5.5 The results of the review indicated that, with the implementation of the proposed mitigation measures, it is considered that the residual landscape and visual impact from the Ping Che Tong Fong SPS and Man Kam To Sha Ling SPS will be reduced to an acceptable level and there will be only insubstantial residual landscape and visual impacts during construction phase.

Operational Phase

4.5.6 The Project will inevitably result in some landscape and visual impacts arising from the proposed works during operation phase, namely:

- Night lighting from these SPSs along the outer edge of the building;
- Boundary fence along the boundary of the SPS.

4.5.7 The proposed Ping Che Road Tong Fong SPS (approximately 6.5m height) and Man Kam To Road Sha Ling SPS (approximately 6.5m height) are considered as a small scale works. Most viewers will not be obstructed by the proposed works as they are relatively low rise at a valley location. It is anticipated that the proposed SPSs would not cause any blockage of view nor visual obstruction to adjacent viewing corridor or prominent view point. Further, the proposed SPSs will not degrade the existing landscape and visual context, nor any mountain view character.

4.5.8 For the minor upgrading of existing pumping station (Ping Che Road Kat Tin SPS), all minor works are placed inside the SPS, namely, replacement of pumps, replacement of internal pipeworks within dry well/valve chamber and associated civil works, provision of at least one duty and one standby pump, provision of dual-feed electricity power supply system if required, provision of sewage emergency overflow system if required, and SCADA system, control and instrumentation. There will be minimal disturbance to the natural landscape and visual resources of adjacent rural character. The minor upgrading works of existing pumping station (i.e. Ping Che Road Kat Tin SPS) will not affect the existing or future visual resources nor cause any blockage of view or visual obstruction to adjacent viewing corridor or prominent view point.

4.5.9 These impacts have been minimized through careful consideration of proposed engineering design, incorporation of aesthetic external designs and landscape treatments of proposed infrastructural works. Upon review of landscape and visual impact, it is considered that, with the implementation of the proposed mitigation

measures, the residual landscape and visual impact will be reduced to an acceptable level and there will be only insubstantial residual landscape and visual impacts during operation phase. Photomontages illustrating appearance of SPSs during operation phase are provided in **Figures 4.1 and 4.2** series.

4.6 Ecology

Construction Phase

- 4.6.1** Direct ecological impact has been minimised by avoiding areas of conservation importance and confining the Project sites to developed areas as much as possible. For the proposed Ping Che Road Kat Tin SPS and Man Kam To Road Sha Ling SPS, direct ecological impacts have been avoided as there will be no loss of natural or semi-natural habitat. However, direct ecological impact in the form of loss of a small section of channelised watercourse would occur as it is covered by the footprint of the proposed Ping Che Road Tong Fong SPS. The section to be lost is approximately 40m in length, covering only 0.015 ha. No specific mitigation measures are considered necessary.
- 4.6.2** Semi-natural tributaries of the Ping Yuen River are located near the proposed Ping Che Road Tong Fong SPS. These tributaries may support aquatic fauna of conservation importance. Further, the channelised section of Ping Yuen River to the west provides suitable foraging and day-roosting habitat for wetland-dependent birds including Greater Painted-snipe and ardeids. Temporary disturbance impacts to these may arise during the construction period.
- 4.6.3** The area to the northwest of the proposed Man Kam To Road Sha Ling SPS is comprised of abandoned agricultural land and ponds. This area may support several species of conservation importance, including Greater Painted-snipe and Chinese Bullfrog. Temporary indirect impacts to these area and wildlife species, such as noise pollution, vibration, water pollution (including site run-off) increased traffic and human activities, may arise during the construction period, although the level of impact is considered to be low. The proposed Long Valley Nature Park (LVNP) is located to the west of the proposed Man Kam To Road Sha Ling SPS but is outside of the 500m Study Area. Significant impact to LVNP is not anticipated.
- 4.6.4** Another potential impact during the construction phase is the disturbance to breeding ardeids in the Ping Che Egrettry in terms of noise, vibration and other human disturbances such as increased traffic. However, the disturbance impact is considered to be of minor level. It is considered unlikely that the proposed works would alter or disturb the flight paths of foraging ardeids, as the human activities in the surrounding area are already at considerable levels.
- 4.6.5** The Man Kam To Road Egrettry is located some 700m from the proposed SPS. Therefore, no significant impact is expected.
- 4.6.6** The remaining areas and habitats within the Study Areas are generally considered to be of lower ecological value, except the *fung shui* woodland at Kan Tau Wai.
- 4.6.7** Further, given the nature and scale of the proposed works, semi-natural or natural habitats located at a distance from the Project Sites are unlikely to be affected by the localised construction works.

Operational Phase

- 4.6.8** No direct or indirect impacts are anticipated during the operational phase.

4.7 Cultural Heritage

Construction Phase

- 4.7.1 The works near Ping Che SAI are in areas previously disturbed and without major archaeological potential. If, however, any antiquities or supposed antiquities are found at the mentioned works sites in the vicinity of Ping Che, irrespective whether during the excavation works or not, works should be halt and AMO should be notified immediately.
- 4.7.2 The proposed works or locations for Ping Che Road Kat Tin SPS, Ping Che Road Tong Fong SPS and Man Kam To Road Sha Ling SPS include impacts within existing disturbed site conditions arising from previous SPS construction or site formation (Ping Che Road Kat Tin SPS, existing Ping Che Road Tong Fong SPS and Man Kam To Road Sha Ling SPS), or disturbance from erosion and meandering by stream (newly proposed location for Ping Che Road Tong Fong SPS) and no further impacts on archaeology are expected.
- 4.7.3 Wing Kit Study Hall, a Grade 3 historic building in Tong Fong is located at 120m from proposed Ping Che Road Tong Fong SPS works. The construction works which are within the footprint of the existing SPS are across a perennial stream and at sufficient distance not to have direct or indirect impacts such as adverse ground-borne vibration on the Wing Kit Study Hall. No other built heritage sites are located near proposed works
- 4.7.4 No direct or indirect impact on cultural heritage is expected during the construction of Ping Che Road Kat Tin SPS, Ping Che Road Tong Fong SPS and Man Kam To Road Sha Ling SPS.

Operational Phase

- 4.7.5 No direct or indirect impact on cultural heritage is expected during the operation of Ping Che Road Kat Tin SPS, Ping Che Road Tong Fong SPS and Man Kam To Road Sha Ling SPS.

4.8 Land Contamination

Construction Phase

- 4.8.1 Based on site appraisal, no potentially contaminated land uses/ activities were identified at the Project sites. No land contamination impacts are anticipated during the construction phase.

Operational Phase

- 4.8.2 No land contamination impacts are therefore anticipated during the operational phase.

5 Environmental Mitigation Measures to be Incorporated in the Design and Any Further Environmental Implications

5.1 Air Quality

Construction Phase

5.1.1 Limited amount of dust emissions is anticipated during the demolition/ upgrading/ construction of the pumping stations. Dust mitigation measures as stipulated in the Air Pollution Control (Construction Dust) Regulation (Cap. 311R) should be implemented to reduce and minimize any potential fugitive dust emission. Possible key measures include:

- Regular watering on all exposed and unpaved surface, particularly during dry weather;
- Frequent watering for particularly dusty construction areas and areas close to ASRs;
- Minimise temporary storage of stockpiles on site;
- Cover excavated or stockpile of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;
- Wheel washing facilities at the exit points of the site;
- Provide hoarding of not less than 2.4m high from ground level along site boundary of the construction works areas which is next to a road or other public area;
- Restrict all motorized vehicles within the site to a maximum speed of 10km per hour;
- Cover dusty materials on vehicles leaving the site; and
- Dust suppression measures.

5.1.2 Ultra-low sulphur diesel (ULSD) with sulphur content not exceeding 0.005% by weight should be used as fuel for all diesel-powered plants and equipment to minimize SO₂ emissions.

Operational Phase

5.1.3 All facilities and areas with potential odour emission such as wet wells, inlet chamber and screen chambers will be housed in by fully enclosed and reinforced concrete structure and the exhausted air will be conveyed to Deodourising (DO) unit with odour removal efficiency of 99.5% in terms of target odour species (i.e. H₂S) for treatment before being discharged. Performance/ compliance test of the DO unit should be included as one of the requirements in the construction contract before the upgraded/ new pumping stations in operation. During operational phase, continuous monitoring of removal efficiency could be achieved by installation of H₂S meter at the inlet and exhaust vent of the DO unit. Exhaust fan will also be provided to the DO unit to maintain a negative pressure in and prevent foul air from releasing. In addition, the exhaust outlets of the DO unit will be strategically located away from the nearby ASRs as far as practicable.

5.1.4 The screening waste will be removed regularly (i.e. at least twice a week) from the upgraded/ new pumping stations, and will be properly packed and handled carefully

inside the screen houses that are fully enclosed by reinforced concrete structure and remained in the covered containers before disposal at landfill site to avoid off-site odour nuisance along the disposal route. The collected screening waste should be transported to designated landfill for disposal immediately after collection from the pumping stations.

5.1.5 Other odour control measures to be considered include:

- Inhibit the generation of odour compound in liquid phase or removal of the odour compound formed in liquid phase by elevating the pH or providing oxygen source;
- Good housekeeping in the sewerage collection systems to prevent the development of anaerobic conditions; and
- Design modifications such as maximizing the sewerage flow velocity in sewers.

5.2 Noise

Construction Phase

5.2.1 Noise mitigation measures stipulated in EPD's "Recommended Pollution Control Clauses for Construction Contracts" and the following good site practices should be implemented during the construction phase:

- Quiet plants, silencers or mufflers on construction equipment;
- Shut down PME that may be intermittent in use between worse periods and throttle down the PME to a minimum;
- Orient plant known to emit noise strongly in certain direction so that the noise is directed away from nearby NSRs;
- Movable and temporary barriers to screen particular items of plant or noisy operations;
- Noise screening structures or purpose-built noise barriers along the site boundary;
- Good site practices such as locate noisy equipment and activities at farthest practicable distance, schedule noisy activities to minimise noise exposure, proper maintenance of construction plant, devise quiet methods of working, and regular noise monitoring; and
- Proper planning of construction vehicle travelling route.

5.2.2 The use of quiet plant associated with the construction works is made reference to the PME listed in the QPME and other commonly used PME listed in EPD web pages as far as possible. Some other quiet plants which are confirmed by project engineer to be suitable and available in Hong Kong for this Project have also been referenced. It is generally known (supported by field measurement) that particular models of construction equipment are quieter than standard types given in the TM-GW. Whilst it is generally considered too restrictive to specify that the contractor has to use specific models or items of plant, it is reasonable and practicable to set plant noise performance specifications for specific PME so that some flexibility in selection of plant is allowed. A pragmatic approach would be to request that the contractor independently verifies the noise level of the plant proposed to be used and demonstrates through furnishing of these results, that the plant proposed to be used on the site meets the requirements.

5.2.3 Movable temporary noise barriers that can be located close to noisy plant and be moved concurrently with the plant along a worksite can be very effective for screening noise from NSRs. A typical design which has been used locally is a wooden framed

barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m^2 on a skid footing with 25mm thick internal sound absorptive lining. This measure is particularly effective for low level zone of NSRs. A cantilevered top cover would be required to achieve screening benefits at upper floors of NSRs.

5.2.4 Movable temporary noise barriers will be used for some PME (e.g. hand-held breaker, concrete lorry mixer, excavator). It is anticipated that suitably designed barriers could achieve at least 5dB(A) reduction for movable plant and 10dB(A) for relatively stationary plant.

5.2.5 The use of standard enclosure has been considered in this assessment to shelter relatively fixed plant including air compressor and generator. These standard enclosures can provide at least 15dB(A) noise reduction.

Operational Phase

5.2.6 Possible key measures to reduce operational noise impact include:

- All fixed plant equipment to be housed within reinforced concrete structure with soundproof doors;
- Silencers or other acoustic treatment equipment to be installed at the outlet of air exhaust fans;
- Layout of the new pumping stations to be optimized such that transformer rooms and louvers will face away from sensitive receivers; and
- The design noise criteria of the upgraded/ new pumping stations should be specified in the contract, and the contractor should design and select equipment that could comply with the contract requirement.

5.2.7 Fixed noise commissioning test should be carried out as per contract requirement prior to operation to demonstrate compliance with the noise criteria. The fixed noise commissioning test report should be submitted to EPD for agreement before the operation of the Project.

5.3 Water Quality

Construction Phase

5.3.1 In order to prevent adverse impacts on water quality, construction site runoff and drainage will be controlled in accordance with the guidelines stipulated in the EPD's "Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94)". The practices include the following:

- Provision of perimeter channels to intercept storm-runoff from outside the site. These shall be constructed in advance of site formation works and earthworks.
- Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance (WPCO). These facilities shall be properly and regularly maintained.
- Careful programming of the works to minimize soil excavation works during rainy seasons.
- Exposed soil surface shall be protected by paving as soon as possible to reduce the potential of soil erosion.

- Temporary access roads shall be protected by crushed gravel and exposed slope surfaces shall be protected when rainstorms are likely.
- Open stockpiles of construction materials on site shall be covered with tarpaulin or similar fabric during rainstorms.

5.3.2 In addition, facilities for collecting sand, silt, oil, debris or rubbish will be recommended and to be regularly emptied and maintained. For the storage of any chemicals on site, the bund of the chemical storage area will be equal to 110% of the storage of the largest tank and securely enclosed.

5.3.3 In view of the close proximity of the site to Ping Yuen River, which would eventually discharge to Deep Bay within 300m from environmental sensitive receivers, the design of the new SPS would be carefully designed to ensure that deep excavation should be away from the stream as much as practicable. Moreover, the excavation would be conducted within steel sheet piles or cofferdam to avoid surface runoff during the construction of SPS.

Operational Phase

5.3.4 Under normal operation condition, sewage gathered from village houses which have connected to public sewerage system and leachate from NENT would be properly collected and conveyed to SWHSTW and no adverse water quality impact is anticipated. Only under remote situation (e.g. pump / power failures at pumping stations or pipe bursting) which causes emergency discharge could result in potential water quality impacts to the nearby WSRs. In order to minimize the consequences of pump / power failure / pipe bursting, various precautionary measures would be implemented to reduce the chances of emergency discharge. These would include the following:

- Provision of at least one duty and at least one standby pump depending on the number of duty pump and wet wells in the future design;
- Provision of dual-feed electricity power supply system (subject to further discussion with relevant stakeholders);
- Provision of a standby mechanical raked bar screen to the screen house of new pumping stations;
- Provision of bar screens in front of emergency overflow pipes at the new pumping stations;
- Installation of alarms with telemetry system connecting to SWHSTW to signal emergency high water level in the wet well and any malfunction of the unmanned facilities;
- Regular maintenance and checking of plant equipment;
- Provision of twin rising mains system to facilitate the maintenance works;
- Tankering away, if necessary, would be conducted as a last resort for proper disposal at public sewage treatment works to maximize buffer for emergency storage as far as practicable, in cases where the broken-down plant cannot be recovered in time to prevent the outflow of raw sewage; and

- Emergency storage for incoming sewage of approximately 0.6-1.7 hours in ADWF.

5.3.5 In case an overflow does occur, all overflow sewage should be screened by bar screen (with clear spacing of ~25 mm) before discharged which can prevent discharging floating solids into receiving water bodies so far as is practicable.

5.3.6 Only in rare cases where all of the above mitigation measures failed to provide contingency support to the upgraded pumping stations, emergency discharge from these pumping stations will be directed away from sensitive receivers such as marsh, ponds and streams with water for human consumption etc. and be conveyed to their nearby watercourses / public drainage system. Based on DSD's past record, the SPS can resume normal operation within 2.5 hours in the event of power or equipment failure.

5.3.7 To suit the new Ping Che Road Tong Fong SPS, the existing engineered concrete low-flow channel would be replaced by a new 20m long 3.5m(W) x 3m(H) drainage box culvert. No additional discharge and significant change in water flow would be anticipated and hence no further mitigation measure is needed.

5.4 Waste

Construction Phase

5.4.1 Good waste management plan and procedures should be implemented to ensure proper handling and disposal of waste and to minimise the quantity of C&D materials and other wastes generated. Under ETWB TCW No. 19/2005 - Environmental Management on Construction Sites, a proper Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Architect/ Engineer for approval before implementation.

5.4.2 On-site sorting of all C&D materials should be carried out prior to disposal. It is recommended that non-inert C&D materials including topsoil, vegetation and wood formwork be separated for re-use and/ or recycling and inert C&D materials be utilised as fill material.

5.4.3 Those inert C&D materials that cannot be re-used or recycled on-site should be disposed of at public fill reception facilities or other CEDD designated public filling areas, while those non-inert C&D materials that cannot be reused or recycled should be disposed to designated landfill sites. Disposal of C&D materials should be managed in accordance with DEVB TCW No. 6/2010 - Trip Ticket System for Disposal of Construction & Demolition Materials.

5.4.4 Stockpile area should be well managed with covers and water spraying system. Stockpiles of C&D materials and other wastes on-site should be covered with tarpaulin or similar fabric during rainstorms.

5.4.5 The contractor should be responsible for ensuring that waste is collected by approved waste collectors and that appropriate measures are taken to minimise adverse impacts, such as dust generation. The contractor must also ensure that all necessary waste disposal permits are obtained.

5.4.6 The contractor is required to register as a chemical waste producer if chemical waste would be produced from the construction activities. 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 the handling, storage and disposal of chemical waste.

5.4.7 Chemical waste should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical waste should be recycled at an appropriate facility as far as possible, while chemical waste that cannot be recycled should be disposed of at either Chemical Waste Treatment Centre (CWTC), or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

5.4.8 General refuse should be collected rapidly and effectively to prevent waste materials being blown around by wind, flushed or leached into the environmental, and odour nuisance. A reputable waste collector should be employed by the contractor to remove general refuse from the site on a daily or every second day basis to minimise odour, pest and litter impacts.

5.4.9 General refuse should be stored in enclosed bins or compaction units and separated from C&D materials and chemical waste.

Operational Phase

5.4.10 Regular maintenance of the upgraded/ new pumping stations is required to remove the screenings generated. The screenings should then be stored in enclosed containers and regularly transported to landfill for disposal. The packing of the containers should be carried out inside the pumping stations. In addition, small amount of chemical and oily waste may be generated from the maintenance activities which should be disposed of as chemical waste in strict compliance with the Waste Disposal (Chemical Waste) (General) Regulation. All chemical waste from equipment maintenance would be handled, stored and disposed of properly and in accordance with the requirements of the Waste Disposal (Chemical Waste) (General) Regulation.

5.5 Landscape and Visual

5.5.1 Below proposed mitigation measures for construction phase should be incorporated to alleviate any potential landscape and visual impact due to the proposed works:

- Erection of Decorative Screen Hoarding (CM1)

Decorative Hoarding, which is compatible with the surrounding settings, shall be erected during construction to minimise the potential landscape and visual impacts due to the construction works and activities.

- Preservation of Existing Vegetation (CM2)

All the existing Trees not to be affected should be retained by the Project and shall be carefully protected during construction in accordance with DEVB TCW No. 4/2020 - Tree Preservation and the latest Guidelines on Tree Preservation during Development issued by GLTM Section of DevB. A detailed working method statement shall be submitted for approval prior to undertaking any works adjacent to all retained trees.

- Transplanting of Affected Trees (CM3)

Trees unavoidably affected by the works shall be transplanted as far as appropriate in accordance with DEVB TCW No. 4/2020 - Tree Preservation and the latest

Guidelines on Tree Transplanting issued by GLTM Section of DevB. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. The receptor site shall be in vicinity to retain the amenity value of the area.

- **Compensatory Tree Planting (CM4)**

Any Trees to be felled under the Project shall be compensated in accordance with DEVB TCW No. 4/2020 - Tree Preservation. For trees to be compensated on slopes, the guidelines for tree planting stipulated in GEO Publication No. 1/2011 will be followed.

- **Control of Night-time Lighting Glare (CM5)**

Any lighting provision of the construction works at night shall be carefully control to prevent light overspill to the nearby habitats, VSRs and into the sky. Shrouded or directional lighting should be considered where appropriate as a general good practice construction measure.

- **Reinstatement of Temporarily Disturbed Landscape Areas (CM6)**

All hard and soft landscape areas disturbed temporarily during construction due to temporary excavations, temporary works sites and works areas shall be reinstated to prevalent standard at the time of reinstatement, to the satisfaction of the relevant Government Departments.

5.5.2 To alleviate the potential landscape and visual impact due to the proposed works during operation, the following proposed mitigation measures shall be incorporated.

- **Aesthetically pleasing design of Aboveground Structures (OM1)**

To promote visual integration with the existing landscape setting, the Architectural Design of SPS should consider a combined architectural finishes which will make the appearance of the development subtler and visually recessive. Measure to achieve this may include careful consideration of built form and textures. The aesthetic design of the pumping station will be designed in accordance to the Guidelines on Aesthetic Design of Pumping Station Buildings issued by DSD and circulate to ASD for comment in accordance with ETWB TCW No. 8/2005. Aesthetic design proposal of the sewerage pumping station should also be submitted to VCAB for vetting in accordance with the DSDTC No. 3/2015 – vetting committee on aesthetic design of drainage services buildings.

- **Provision of Buffer Planting and Vertical Greening (OM2)**

Buffer planting shall be provided around the boundary fence to soften and provide screening for the Pump House. Vertical greening can help to soften the roof line and the building mass of the proposed sewage pumping station. Besides, greening of the boundary fences/ walls can soften the structure itself and provide a harmonising effect. The boundary fences/ walls of the proposed sewage pumping station will have the greatest visual impact on the passers-by and the achievement of visual diversity is considered to be a crucial element of the aesthetic design of the sewage pumping station to gain public acceptance. All greening measures and greening provision shall be considered in accordance with DEVB TC(W) No. 3/2012.

- Provision of Green Roof (OM3)

As the proposed sewage pumping station is located in an urban environment, roof top greening is recommended to provide visual amenity to the occupants and residents of the nearby high rise residential buildings. Green Roof shall be proposed to enhance the landscape quality of Pump House and to mitigate any potential adverse visual impact on adjacent VSRs. In addition to the green roof, renewable energy technology, namely, PV panel, should be incorporated to promote sustainability in accordance with DEVB TC no. 2/2015 – Green Government Building.

5.6 Ecology

Construction Phase

- 5.6.1** The loss of a channelised watercourse under the footprint of the proposed Ping Che Road Tong Fong SPS is considered minor given the small size and its nature as a man-made drainage channel. No specific mitigation measures are required.
- 5.6.2** Other major form of impacts during the construction phase would be the disturbance to adjacent water bodies and sensitive species.
- 5.6.3** For the small, channelised section of Ping Yuen River to be lost, the existing water flow would be diverted to the adjacent counter high-flow channel prior to the commencement of site formation works in order to avoid site runoff discharging into the downstream area of Ping Yuen River. Other measures described in **Sections 5.3.1** and **5.3.2** should also be implemented to protect the aquatic habitats that would potentially be affected.
- 5.6.4** Disturbance impacts to the agricultural area across Man Kam To Road and the associated species would be relatively low as the area is located approximately 150m away from the project boundary, though construction noise should be minimised following the recommendations in **Section 5.2.1-5.2.5** to reduce the disturbance impact.
- 5.6.5** The Ping Che Egretty is located approximately 360m from the project boundary. With the measures recommended in **Sections 5.2.1-5.2.5** to minimise construction noise, the potential disturbance impact should be at a minor level, and no specific mitigation measures are required.
- 5.6.6** The Man Kam To Road Egretty is located approximately 700m from the proposed Man Kam To Road Sha Ling SPS. With such distance, significant disturbance impact to the Egretty is not anticipated.

Operational Phase

- 5.6.7** Due to the nature and scale of the SPS and LPS, no direct or indirect impacts are predicted. No operational phase mitigation measures are required.

5.7 Cultural Heritage

Construction and Operational Phase

- 5.7.1** No mitigation is required for built heritage or archaeology during the construction or operational phases. Nevertheless, the contractor is required to inform AMO if any

antiquities or supposed antiquities are found at the works site, irrespective whether during the excavation works or not, especially near Ping Che SAI.

5.8 Land Contamination

Construction Phase

5.8.1 Based on site appraisal, no potentially contaminating activities were identified at the Project sites. No land contamination impacts are anticipated during the construction phase. Hence, no mitigation measures are recommended.

Operational Phase

5.8.2 As no land contamination impacts are anticipated during the operational phase, no mitigation measures are recommended.

5.9 Environmental Monitoring & Audit

5.9.1 With the implementation of the recommended mitigation measures, no adverse environmental impacts would be anticipated and hence no environmental monitoring is considered necessary.

5.9.2 Regular site audit will be conducted during the construction phase to ensure the proper implementation of recommended mitigation measures.

5.10 Severity, Distribution and Duration of Environmental Effects and Further Implications

5.10.1 In view of the nature of the Project, the associated environmental impacts would be small scale, localized and short-term. With the implementation of the recommended mitigation measures, no adverse residual impacts are anticipated from the Project.

5.11 History of Similar Projects

5.11.1 A number of similar projects were also granted permissions from the DEP to apply directly for an EP through the submission of project profiles. They are listed and tabulated in **Table 5.1** below.

Table 5.1: Permitted projects from the DEP to apply directly for an EP

Application No.	Project Profile No.	Project Profile Title	ADWF (m ³ /day)	Distance to nearest sensitive receivers (m)
DIR-264/2018	PP-572/2018	Sewage Pumping Station at Tseng Lan Shue	3,337	17
DIR-258/2017	PP-560/2017	Upgrading of Sewage Pumping Stations and Sewerage along Ting Kok Road	5,420 - 21,200	13
DIR-257/2017	PP-557/2017	Fanling North Temporary Sewage Pumping Station	3,600	47
DIR-242/2015	PP-529/2015	Queen's Hill Sewage Pumping Station	11,000	21

Application No.	Project Profile No.	Project Profile Title	ADWF (m ³ /day)	Distance to nearest sensitive receivers (m)
DIR-241/2015	PP-527/2015	Proposed Sewage Pumping Station and Dry Weather Flow Interceptor at Cherry Street Box Culvert	43,200	10
DIR-239/2014	PP-520/2014	Public Housing Development at Lin Cheung Road Site – Temporary Sewage Pumping Station and Associated Sewer Pipes	3,000	1
DIR-226/2013	PP-481/2013	Temporary Sewage Pumping Station Ancillary to Tung Chung Area 56 Public Housing Development	2,312	22
DIR-218/2011	PP-454/2011	Sewerage Works at Pik Shui Sun Tsuen	216	15
DIR-173/2008	PP-371/2008	Yuen Long Kau Hui No. 2 Sewage Pumping Station	5,900	30
DIR-161/2007	PP-334/2007	Tai Po Tai Wo Road Sewage Pumping Station	12,100	29
DIR-115/2005	PP-338/2005	Upgrading of Ting Kok Road Pumping Station No. 5	11,520	60
DIR-057/2001	PP-139/2001	Sai Kung Area 4 Sewage Pumping Station	7,500	34
DIR-040/2000	PP-071/1999 PP-097/2000	Au Tau Sewage Pumping Station (relocation)	12,200	80

6 Use of Approved EIA Reports / Direct EP Applications

6.1.1 List of Approved EIA Reports / Direct EP Application referenced include:

- Sewage Pumping Station at Tseng Lan Shue (DIR-264/2018);
- Upgrading of Sewage Pumping Stations and Sewerage along Ting Kok Road (DIR-258/2017);
- Proposed Sewage Pumping Station and Dry Weather Flow Interceptor at Cherry Street Box Culvert (DIR-241/2015);
- Police Facilities in Kong Nga Po (AEIAR-201/2016);
- Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery (AEIAR-198/2016);
- Tung Chung New Town Extension (AEIAR-196/2016);
- Fanling North Temporary Sewage Pumping Station (DIR-257/2017);
- Queen's Hill Sewage Pumping Station (DIR-242/2015);
- Public Housing Development at Lin Cheung Road Site – Temporary Sewage Pumping Station and Associated Sewer Pipes (DIR-239/2014);
- Temporary Sewage Pumping Station Ancillary to Tung Chung Area 56 Public Housing Development (DIR-226/2013);
- Sewerage Works at Pik Shui Sun Tsuen (DIR-218/2011);
- Yuen Long Kau Hui No. 2 Sewage Pumping Station (DIR-173/2008);
- Tai Po Tai Wo Road Sewage Pumping Station (DIR-161/2007);
- Upgrading of Ting Kok Road Pumping Station No. 5 (DIR-115/2005);
- Sai Kung Area 4 Sewage Pumping Station (DIR-057/2001);
- Au Tau Sewage Pumping Station (relocation) (DIR-040/2000); and
- Kai Tak Development (AEIAR-130/2009).

7 Conclusion

- 7.1.1** The predicted environmental impacts from the Project are unlikely to be adverse and the mitigation measures described in this Project Profile meet the requirements of the Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO).
- 7.1.2** This Project Profile has been prepared to seek permission from the DEP to apply directly for an EP under Section 5(11) of the EIAO (Cap. 499).

Figures

Appendix 1.1

Section Drawings of the Proposed SPSs

Appendix 2.1

Locations of Concurrent Projects

Appendix 3.1

Photos of Representative Existing NSRs

Appendix 3.2

Historical Aerial Photos

Appendix 3.3

Correspondence with FSD

Appendix 3.4

Correspondence with EPD

Appendix 3.5

Site Walkover Checklist

Appendix 4.1

Plant Inventory

Appendix 4.2

Cumulative Construction Noise Calculation

Appendix 4.3

Calculation of Maximum Permissible SWLs of the Upgraded/ New Pumping Stations