Site Office (DC/2018/08) – Unit No. 2507-2509, 25/F, The Octagon, No. 6 Sha Tsui Road, Tsuen Wan, N.T.
Fax 傳真: 3188 5841

Our Ref : 382766/(DC/2018/08)/M45/110/(802679)
Your Ref :

8 November 2021

Distribution List

Dear Sirs,

Contract No. DC/2018/08
Inter-reservoirs Transfer Scheme –
Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Monthly Environmental Monitoring and Audit (EM&A) Report
(September 2021)

I write to inform you that the monthly EM&A Reports for September 2021 have been certified by the ET leader and verified by the IEC in accordance with Condition 4.3 of the EP. The report will be submitted to EPD separately.

Please note that the following measures have been taken to enhance the EM&A programme:

- Review of water sampling methodology
- Enhancement of records of water monitoring and noise monitoring
- Review of relevant reference for noise level adjustment

The Baseline Monitoring Report in accordance with Condition 4.2 of the EP and EM&A Manual is also being reviewed and updated to enhance the records of water monitoring, e.g. additional of record photos and sampler. The revised report will be submitted once available.

Should you have any queries, please contact my Resident Engineer Mr. Irving Sze at 3959 7366.

Yours faithfully,

Wilson Lam
Chief Resident Engineer

Distribution List:

SE/DP2, DSD	- Attn: Mr. N.F. Wan, Antony
E/NTE (Headworks 1), WSD	- Attn: Mr. Anthony Lau

WL/IS/cc

Binnies Hong Kong Limited 43rd Floor, AIA Kowloon Tower, 100 How Ming Street, Kowloon, Hong Kong Tel 電話: 2601 1000
賓尼斯工程顧問有限公司 香港九龍巧明街 100 號友邦九龍大樓 43 樓 Fax 傳真: 2601 3988

嘉誠管理顧問有限公司
Ka Shing management consultant Limited

Our ref: 08-10-2021

08-10-2021

By email: cre.wilsonlam@hkirts.com

Binnies Hong Kong Limited

Unit No. 2507-2509, 25/F, The Octagon,

No. 6 Sha Tsui Road,

Tsuen Wan, N.T.

(Attn: Wilson Lam)

Dear Mr. Lam,

Re: Contract No. CM 10/2018

Independent environmental checker services for inter-reservoirs transfer scheme (IRTS)

– water tunnel between Kowloon byewash reservoir and lower shing mun reservoir

27th Monthly EM&A Report (Rev. 2)

Reference is made to the submission of the 27th Monthly EM&A Report (Rev. 2) and provided to us via email dated on 08-10-2021 for our review and comment.

The ET Leader and ET are reminded that according to condition 2.2 of the Environmental Permit No. EP-345/2009/A the ET and the ET Leader shall be responsible for the implementation of the EM&A programme in accordance with the relevant EM&A requirements as contained in the EM&A Manual.

Please be informed that IEC has comments on the captioned submission. Some of the unverified items in the 24th, 25th and 26th Monthly EM&A Reports are pending for further information. IEC would like to remind the ET Leader shall provide proper documentation and records for inspection in relation to Section 2.6.2 of EM&A manual. IEC hereby writes to verify the captioned submission in accordance with Condition 2.1 of the Environmental Permit No. EP-345/2009/A.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,

For and on behalf of

Ka Shing Management Consultant Limited

Douglas Wong

Unit 2, 13/F Kai Yue Commercial Building, 2C Argyle St, Mong Kok, Kowloon
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嘉誠管理顧問有限公司
Ka Shing management consultant Limited

Dr. Wong

Independent Environmental Checker

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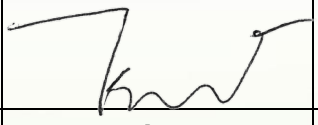
27th Monthly EM&A Report (Rev. 2)

September 2021

for

Inter-Reservoir Transfer Scheme – Water Tunnel Between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir (Contract No.: DC/2018/08)

	Prepared by:	Checked by:	Certified by:
Name	Kelvin LAU	Nelson TSUI	Kevin LI
Position	Environmental Team Member	Environmental Team Member	Environmental Team Leader
Signature			
Date	8 October 2021	8 October 2021	8 October 2021

Revision History

Rev.	Description	Date
0	1st Submission for Comments	5 October 2021
1	Revision according to IEC and Supervisor's comments	7 October 2021
2	Revision according to IEC's comments	8 October 2021

EXECUTIVE SUMMARY

E1. Acuity Sustainability Consulting Limited (ASCL) has been commissioned by Bouygues Travaux Publics to undertake the assignment as the Environmental Team (ET) for the Designated Project of West Kowloon Drainage Improvement – Inter-reservoirs Transfer Scheme (IRTS) (the Project), with Contract No. DC/2018/08.

E2. This is the 27th Monthly Environmental Monitoring and Audit (EM&A) Report presents EM&A works undertaken in the period from 1 to 30 September 2021. EM&A works were performed in accordance with the approved EM&A Manual and conditions stipulated in the amended Environmental Permit EP-345/2009/A.

E3. According to the approved EM&A Manual, construction noise and water quality monitoring are required to be performed during the construction phase of the Project. Five (5) sessions of construction noise impact monitoring at NM1and NM2 for daytime except general holidays and Sundays; four (4) sessions of construction noise impact monitoring at NM1 for daytime during general holidays and Sundays; five (5) sessions of construction noise impact monitoring at NM1 for all days during evening and five (5) sessions of construction noise impact monitoring at NM1 for all days during night time were conducted during the reporting period. Thirteen (13) sessions of impact water quality monitoring at all approved monitoring points were carried out in the reporting period.

E4. The control points C1b and C2 were observed with very shallow flow on all sampling days in September 2021. Insufficient water was available for sample collection.

E5. No exceedance was recorded for noise and water monitoring in the reporting period.

E6. Joint weekly site inspections were conducted by representative of ET, Contractor and Engineer on 7, 17, 23 and 28 September 2021. Details of the audit findings and implementation status are presented in Section 5.

E7. No complaint regarding environmental issue was received in the reporting period.

E8. No notification of summons nor prosecution have been received since the commencement of the Project.

E9. The variation of Environmental Permit was issued on 11 November 2020. The amendments incorporated into the Environmental Permitare summarized as follow:

- "Location of Designated Project" changed;
- Location of cofferdam changed;
- Content of earth bund added;
- More plant species of conservation importance added.

E10. Construction works undertaken in the reporting period include the following:

Works Area	Major Site Activities
Portion A & D	• TBM demolish • Noise enclosure dismantling • Batching plant and silo tank dismantling
Portion C	• Maintenance walkway superstructure • Mined tunnel construction works

E11. Construction works to be undertaken in the next reporting period include the following:

Works Area	Major Site Activities
Portion A & D	• Pipe piling works
Portion C	• Mined tunnel construction works

E12. The Contractor was reminded that all works to be undertaken within the water gathering ground of Lower Shing Mun Reservoir (LSMR) and Kowloon Byewash Reservoir (KBR) must fulfill statutory environmental requirements, especially in watercourse protection.

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1. INTRODUCTION

1.1 Acuity Sustainability Consulting Limited (ASCL) has been commissioned by Bouygues Travaux Publics to undertake the assignment as the Environmental Team (ET) for the contract of West Kowloon Drainage Improvement – Inter-reservoirs Transfer Scheme (IRTS) (the Project), with Contract No. DC/2018/08.The Project comprises the following principal works elements:

- Construction of a new water tunnel, with about 2.8 km in length and 3m in diameter, from KBR to LSMR;
- Construction of an intake structure at KBR and an isolation system;
- Construction of an outfall structure at LSMR with an energy dissipater; and
- All associated civil, structural, geotechnical, electrical and mechanical works, including landscaping, permanent and temporary accesses as may be necessary for the completion of the works elements listed above.

1.2 The Project site consists of the intake site at KBR and the outfall site at the Lower Shing Mun Reservoir. The layout of the Project site is presented in **Appendix A**.

1.3 This project is a Designated Project under Part I of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO). An Environmental Permit (EP), with Permit No. EP345/2009, was granted to the Water Supplies Department (WSD) for permitting the construction and operation of this Project. Subsequently, the EP was amended and a variation of EP, with Permit No. EP345/2009/A, was granted to the WSD on 11 November 2020.

1.4 The commencement date of construction of the Project was 12 July 2019. No major works except site clearance and preparation was performed before the commencement date of construction.

1.5 This is the 27th Monthly Environmental Monitoring and Audit (EM&A) Report presenting results and findings of all EM&A work required in the approved EM&A Manual for the period from 1 to 30 September 2021.

1.6 All project information since the commencement of work under EP including Monthly EM&A Reports is made available to the public via internet access at the website: https://www.epd.gov.hk/eia/register/permit/latest/vep5822020.htm

1.7 As part of the EM&A programme, baseline monitoring is required for determining the ambient environmental conditions. Baseline monitoring including background noise and water quality were conducted in periods from 3 May 2019 to 22 June 2019 in accordance to the approved EM&A Manual before commencement of construction works. The corresponding Baseline Monitoring Report has been compiled by the ET and verified by

the Independent Environment Checker (IEC) prior submitting to the Environmental Protection Department.

1.8 Project organization structure is presented in Figure 1.1.

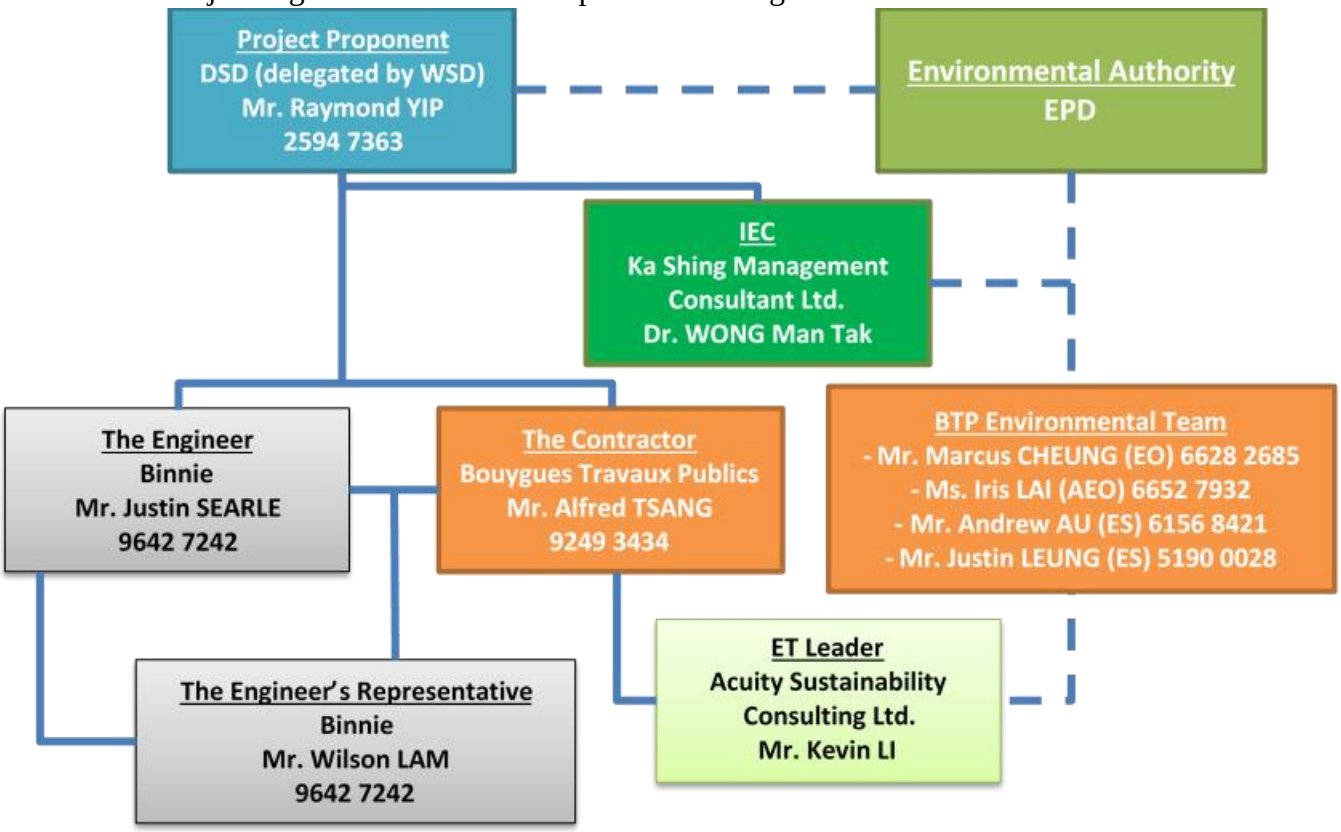


Figure 1.1 Project Organization Chart

1.9 Contact details of key personnel are presented in Table 1.1 below.

Table 1.1 Contact Details of Key Personnel

Party	Position	Name	Contact No.
Bouygues Travaux Publics	Site Agent	Mr. Alfred Tsang	3959 7317
Acuity Sustainability Consulting Limited	Environmental Team Leader	Mr. Kevin Li	2698 6833
Ka Shing Management Consultant Limited	Independent Environment Checker	Dr. Douglas Wong	2618 2166

1.10 Details of major construction activities undertaken in this reporting period are shown in Table 1.2 below. The construction programme is presented in **Appendix B**.

Table 1.2 Summary of Construction Activities Undertaken in the Reporting Period

Works Area	Major Site Activities
Portion A & D	• TBM demolish • Noise enclosure dismantling • Batching plant and silo tank dismantling
Portion C	• Maintenance walkway superstructure • Mined tunnel construction works

1.11 A summary of status of environmental legislations related licences, permits and/or notifications is presented in Table 1.3.

Table 1.3 Summary of Environmental Licences and Permits of the Project

Type of Permit / License	**Date of Application**	**Reference Number**	**Status**	**Duration**
Variation of Environmental Permit	15-Oct-2020	EP-345/2009/A	Valid	Along project
Chemical Waste Producer	22-Feb-2019	WPN5218-733-B2557-01	Approved.	Along project
Notification of The Air Pollution Control (Construction Dust) Regulation	1-Mar-2019	442711	Completed (No approval required)	Along project
Billing Account of Trip Ticket System	25-Feb-2019	703344617	Approved on 13 March 2019	Along project
Effluent Discharge License for LSMR	4-Apr-2019	WT00034164-2019	Approved	Until 31-Jul-2024
Effluent Discharge License for KBR	30-Sep-2019	WT00035821-2020	Approved	Along project (Until 31-May-2025)
Construction Noise Permit for 24-hr TBM assembly at Portion A & D	9-Jul-2021	GW-RN0507-21	Approved	06-Aug-2021 to 05 Feb-2022

Type of Permit / License	Date of Application	Reference Number	Status	Duration
Construction Noise Permit for works at Portion C	27-May-2021	GW-RN0377-21	Approved	14-Jun-2021 to 13-Dec-2021
Construction Noise Permit for works at Tai Po Road	8-Apr-2021	GW-RN0255-21	Approved	13-May-2021 to 12-Nov-2021

Remark: Information for table 1.3 will be updated by the Contractor.

1.12 Contract documents required under conditions stipulated in the amended Environmental Permit are summarized in Table 1.4.

Table 1.4 Documents Submission Required in the amended Environmental Permit

Document	EP Condition No.	Timeframe	Status	Remarks
Landscape Plan	2.4 & 2.5	Submission of document shall be done no later than 6 months after commencement of construction.	The document was submitted to EPD on 9 January 2020.	Submission date to be updated with DSD.
Condition Survey Report for Historic Structures	2.6	Document shall be deposited to the authority before commencement of construction.	The document was deposited to EPD on 3 June 2019.	N.A.
Baseline Monitoring Report	4.2	Submission of document shall be done at least two weeks before commencement of construction.	The document was submitted to EPD on 28 June 2019.	1st Revision was submitted to EPD on 6 August 2019.

2. ENVIRONMENTAL MONITORINGREQUIREMENTS AND PROGRAMME

2.1 The Environmental Monitoring and Audit requirements are set out in the approved EM&A Manual. Construction noise and water quality were identified as key environmental issues during the construction phase. A summary of the requirements for conducting impact noise and water quality monitoring is presented in the sub-sections below.

Monitoring Parameters, Time and Frequency

2.2 Impact monitoring parameters are summarized in Table 2.1 below.

Table 2.1 – Summary of Impact Monitoring Parameters

Environmental Aspect	Parameters	Frequency
Noise	• 1 no. of L_{eq}(30min) noise measurements between 0700-1900 hours on any normal weekdays • 3 nos. of consecutive L_{eq}(5min) noise measurement between 0700-1900 hours on general holidays or Sunday (if worksare undertaken) • 3 nos. of consecutive L_{eq}(5min) noise measurement between 1900-2300 hours (if evening worksare undertaken) • 3 nos. of consecutive L_{eq}(5min) noise measurement between 2300-0700 hours (if nighttime worksare undertaken)	• Once per week
Water Quality	• Dissolved Oxygen (mg/L) • Dissolved Oxygen Saturation (%) • pH Value • Turbidity (NTU) • Temperature (^{o} C) • Suspended Solids (mg/L)	• 3 times per week • Interval between two sets of monitoring shall not be less than 36 hours

Monitoring Locations

Noise

2.3 According to Section 4.4 of the approved EM&A Manual, the two most representative and affected noise sensitive receivers (NSRs) were designated as monitoring stations. Details regarding the two noise monitoring stations are shown in Table 2.2. Layout plans showing the monitoring locations are presented in **Appendix C**.

Table 2.2 – Designated Noise Monitoring Location

Location ID (ID in EM&A Manual)	**Type of NSR**	**Location**	**Description**
NM1 (LG)	Residential	Tower 1, Lakeview Garden	The closest NSR to the Outfall Site (LSMR)
NM2 (VH)	Residential	4 ½ Milestone, Tai Po Road	The closest NSR to the Intake Site (KBR)

Water Quality

2.4 According to Section 5.4 of the approved EM&A Manual, water quality monitoring should be performed at designated monitoring stations. Details regarding the four designated water quality monitoring stations are shown in Table 2.3.

Table 2.3 – Original Water Quality Monitoring Location

ID	**Description**	**Location**
C1	Control Point near Intake Site	Stepped channel by-passing KBR
D1	Impact Monitoring Point near Intake Site	Junction of stepped channel and overflow channel of KBR
C2	Control Point near Outfall Site	Natural Stream directing to Lower Shing Mun Reservoir
D2	Impact Monitoring Point near Outfall Site	Overflow channel of Lower Shing Mun Reservoir

2.5 As conditions of designated water quality monitoring locations have been changed since the issuing of the approved EM&A Manual, location C1, D1 and D2 are no longer feasible for conducting water quality monitoring. Therefore, the three locations were proposed to relocating to alternative monitoring locations. The proposal of alternative monitoring location was approved by EPD on 20 May 2019. Details regarding the approved water quality monitoring stations are shown in Table 2.4. Layout plans showing the original and approved monitoring locations are attached in **Appendix C**.

Table 2.4 – Approved Water Quality Monitoring Location

ID	Description	Location
C1b	Control Point near Intake Site	Overflow channel of Kowloon Reception Reservoir (KRR)
D1b	Impact Monitoring Point near Intake Site	KBR
C2	Control Point near Outfall Site	Natural Stream directing to LSMR
D2a	Impact Monitoring Point near Outfall Site	LSMR

Monitoring Equipment

Noise

2.6 As referenced to the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring.

2.7 Immediately prior to and following each noise measurement the accuracy of the sound level meter should be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0dB. The acoustic calibrator to be used shall meet IEC 942, 1988 Class 1 specifications. Annual calibration of all sound level meters and acoustic calibrators shall be conducted by a laboratory in Hong Kong or the manufacturer in compliance with national standards as recommended by the manufacturer of the sound level meter and acoustic calibrator.

Water Quality

2.8 DO and water temperature should be measured in-situ by a DO/temperature meter. The equipment should be portable and weather proof using a DC power source. It should have a membrane electrode with automatic temperature compensation complete with a cable. The equipment should be capable of measuring:

- A DO level in the range of 0-20 mg/l and 0-200% saturation; and
- A temperature of between 0 and 45 degree Celsius.

2.9 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions (e.g. Orion Model 250A or an approved similar instrument) accordingly to the Standard Methods, APHA.

2.10 Turbidity should be measured in situ by the nephelometric method. The instrument should be portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. The equipment should be capable of measuring turbidity between 0-1000 NTU.

2.11 A water sampler, consisting of a transparent PVC or glass cylinder of a capacity of not less than two litres which can be effectively sealed with cups at both ends should be used. If water at sampling location is too shallow or not applicable for use of water sampler, a water bucket made of inert material (e.g. plastic) should be used instead.

2.12 In-situ monitoring instruments should be checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals.

Environmental Quality Performance Limits (Action/Limit Levels)

2.13 The baseline results form basis for determining the environmental acceptance criteria for the impact monitoring. Derived Action/Limit Levels for noise and water quality are summarised in Table 2.5 and 2.6 respectively.

Table 2.5 – Action/Limit Levels for Construction Noise Monitoring

Time Period	Action Level	Limit Level, dB(A)
Daytime (0700-1900) except general holidays and Sunday **Measurements in $L_{eq\ (30min)}$*	When one documented compliant is received	75
Daytime (0700-1900) during general holidays and Sundays and all days during Evening (1900-2300 hrs) **Measurements in $L_{eq\ (5min)}$*		60
Night-time (2300 – 0700 hrs) **Measurements in $L_{eq\ (5min)}$*		45

Table 2.6 – Action/Limit Levels for Water Quality Monitoring

Parameter	Performance Criteria	Monitoring Location	
		D1b	**D2a**
Dissolved Oxygen (mg/L)	Action Level	6.1	6.3
	Limit Level	5.8	6.1
pH Value	Action Level	8.8	9.0
	Limit Level	≤ 6.5 **OR** ≥ 8.9	≤ 6.5 **OR** ≥ 9.2
Turbidity (NTU)	Action Level	19.5	13.1
		OR 120% of upstream control station of the same day	
	Limit Level	23.4	18.9
		OR 130% of upstream control station of the same day	
Suspended Solids (mg/L)	Action Level	9.0	22.0
		OR 120% of upstream control station of the same day	
	Limit Level	13.0	25.0
		OR 130% of upstream control station of the same day	

Remarks:

1. Non-compliance occurs when monitoring result of Dissolved Oxygen is lower than the limits.

2. Non-compliance occurs when monitoring result of pH value is higher than the Action Levels or when the result does not fall into the pH range of the Limit Levels.

3. Non-compliance occurs when monitoring results of Turbidity and Suspended Solids is higher than the limits.

Event / Action Plan

2.14 Should there be any triggering of Action Levels, or exceedance of Limit Levels, the Event / Action Plan established in the approved EM&A Manual should be followed. The Event / Action Plan is attached in **Appendix H**.

3. IMPACT MONITORING METHODOLOGY AND RESULTS

Equipment Used

3.1 Equipment used in impact noise and water quality monitoring during the reporting period is summarized in Table 3.1 below. Calibration certificates of equipment used are attached in **Appendix D**.

Table 3.1 – Equipment Used in the Reporting Period

Environmental Aspect	Equipment	Model
Noise	Sound Level Meter	Svantek 731
	Sound Level Meter	XL2
	Calibrator	Svantek 33B
	Portable Anemometer	Kestrel 1000
Water Quality	Multifunctional Meter	HORIBA U-53 Multiparameter Water Quality Meter

Monitoring Procedure

Noise

3.2 Field measurement procedures for each set of the noise level measurement are as followed:

i. Record the field condition including weather conditions and any other potential source of interference;
ii. Turn the power of sound level meter on;
iii. Check the general condition of the sound level meter and the battery status;
iv. Mount the sound level meter onto a tripod of 1.2 m height;
v. Check the distance of the probe from closest facade;
vi. Adjust the orientation of probe so that it is facing the project site;
vii. Calibrate the sound level meter by using acoustic calibrator;
viii. Select the period of measurement to be 30 minutes;
ix. Select the appropriate displaying unit, dB(A);
x. Collect and record the sampled data;
xi. Calibrate the sound level meter by using acoustic calibrator. Repeat procedure ii. to xi. if the difference in calibration level is more than 1.0 dB.

3.3 All noise measurements were performed in the absence of fog, rain and wind with a speed exceeding 5m/s or wind with gusts exceeding 10m/s. Wind speed was checked with portable wind speed meter.

Water Quality

3.4 Field measurement procedures for each set of the water quality measurement are as followed:

i. The DO probe of the multifunctional meter is checked by wet bulb method; the pH and turbidity probes are checked against standard solutions. Record the checking result;
ii. Record the field condition including weather conditions and any other potential source of interference;
iii. Lower the sampler into water body and rinse it with water in the target water body;
iv. Fill the sampler until adequate sample is collected. Replicate sample at each monitoring location is required;
v. Rinse the bottles by the sample before transferring samples into containing bottles;
vi. Rinse the probe of multimeter with distilled water;
vii. Measure and record temperature, turbidity, pH value and DO of each bottle of sample;
viii. Bottles containing sample is stored temporarily in insulation box with ice until reaching the laboratory;

3.5 Analysis of SS was carried out in a HOKLAS accredited laboratory. Standard test method, APHA 2540 D, in accordance to American Public Health Association: Standard Methods for the Examination of Water and Wastewater APHA 21 ed was adopted.

Data Management and QA/QC

3.6 The monitoring data were handled by the ET's in-house data recording and management system. Laboratory responsible for laboratory analysis would follow QA/QC requirements as set out under HOKLAS scheme.

3.7 The in-situ monitoring data measured in the equipment were recorded by both field operators and by the equipment itself. Laboratory analysis results were directly issued by the designated laboratory. All data were then input into a computerized database which is properly maintained by the ET. Cross checking between results was performed by other personnel.

Noise Monitoring Result

3.8 Construction noise monitoring was performed at during the reporting period. No work was conducted during restricted hours at KBR as confirmed by the Contractor, therefore no noise monitoring was performed during restricted hours at NM2 in the reporting period.

3.9 Evening time construction work has been conducted since 25 March 2020. Evening time monitoring was conducted on 3, 9, 16, 24 and 29 September 2021 at NM1. The evening time construction noise monitoring data is presented in Table 3.2

Table 3.2 Summary of Evening Time Noise Monitoring Result

Monitoring Location	Time Period	$L_{eq(5min)}$, dB(A)			Limit Level, dB(A)
		Mean	Max	Min	
NM1	All days during Evening (1900-2300)	48.8	49.9	48.4	60

3.10 Night time construction work has been conducted since 6 April 2020. Night time monitoring was conducted 3, 9, 16, 24 and 29 September 2021. The night time construction noise monitoring data is presented in Table 3.3

Table 3.3 Summary of Night Time Noise Monitoring Result

Monitoring Location	Time Period	$L_{eq(5min)}$, dB(A)			Limit Level, dB(A)
		Measured	Baseline	Corrected(1)	
NM1	All days during Night (2300-0700)	43.5-44.7	51.9	Below Baseline	45

(1) When applicable, the measured noise levels are corrected against the baseline noise levels by using the formula: $10\log(10^{\frac{measured\ level}{10}} - 10^{\frac{baseline\ level}{10}})$

3.11 Daytime during general holidays and Sundays construction work was conducted on 5, 12, 19 and 22 September 2021.Construction noise monitoring was also conducted in the same days. The daytime during general holidays and Sundays construction noise monitoring data is presented in Table 3.4.

Table 3.4 Summary of Daytime during General Holidays and Sundays Noise Monitoring Result

Monitoring Location	Time Period	$L_{eq(5min)}$, dB(A)			Limit Level, dB(A)
		Mean	Max	Min	
NM1	Daytime (0700-1900) during general holidays and Sundays	51.2	53.6	47.1	60

3.12 Five (5) sessions of construction noise impact monitoring at NM1 and NM2 for daytime except general holidays and Sundays. The noise monitoring data is presented in **Appendix E** and results are summarized in Table 3.5.

Table 3.5 Summary of Construction Noise Monitoring Results

Monitoring Location	Time Period	$L_{eq(30min)}$, dB(A)			Limit Level, dB(A)
		Mean	Max	Min	
NM1	Daytime (0700 – 1900) except general holidays and Sunday	54.7	55.6	53.6	75
NM2		51.8	53.2	50.5	

3.13 No construction noise related complaint was received in the reporting period. There was no Action / Limit Levels exceedance of construction noise recorded in the reporting period.

3.14 Weather conditions were mainly cloudy with sunny intervals during daytime measurements, and mainly a clear sky with occasional cloud coverage during evening and night time measurements. Summary of meteorological data is presented in **Appendix G**.

Water Quality Monitoring Result

3.15 Water quality monitoring was performed at approved monitoring locations, i.e. C1b, D1b, C2 and D2a, during the reporting period.

3.16 Thirteen (13) sessions of water quality monitoring were performed at each of the approved monitoring locations. The water quality monitoring data is presented in **Appendix F** and results are summarized in Table 3.6.

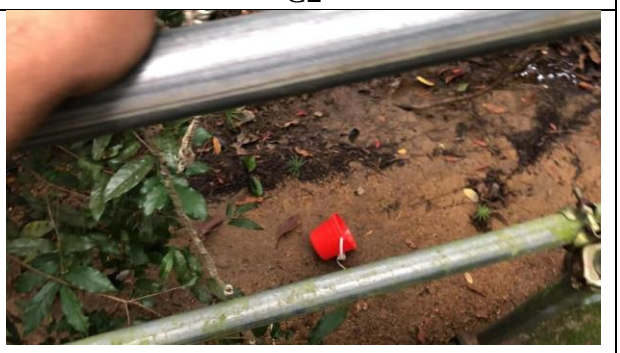
Table 3.6 Summary of Water Quality Monitoring Results

Parameters		C1b	D1b	C2	D2a
Dissolved Oxygen (mg/L)	**Min**	/	6.5	/	6.7
	Max	/	8.8	/	9.1
	Mean	/	7.4	/	7.5
Dissolved Oxygen Saturation (%)	**Min**	/	86.8	/	85.1
	Max	/	114.6	/	112.2
	Mean	/	97.1	/	98.3
pH Value	**Min**	/	7.0	/	6.9
	Max	/	8.3	/	8.2
	Mean	/	7.3	/	7.4
Turbidity (NTU)	**Min**	/	0.4	/	0.8
	Max	/	4.3	/	5.1
	Mean	/	1.7	/	2.3
Suspended Solids [1] (mg/L)	**Min**	/	2.5	/	2.5
	Max	/	4.5	/	3.0
	Mean	/	2.8	/	2.6

Remarks:
1. Lower detection limit of Suspended Solids is 2.5. Data lower than such limit is regarded as 2.5 in result presentation.

3.17 The water level at Lower Shing Mun Reservoir (i.e., monitoring location D2a) changes in time. Due to the access constraint, water sampling could only be done at the boundary of the water body. Hence, the actual sampling location of D2a is subject to the actual water level of the reservoir and was determined on-site at locations close to the site. A water bucket made of inert material (e.g., plastic) was used at sampling location D2a.

3.18 The control points C1b and C2 were observed with very shallow flow on all sampling days in September 2021. Insufficient water was available for sample collection

C1b	C2
	
*Photo taken on 29 September 2021	*Photo taken on 29 September 2021

3.19 As a result, some Action and Limit levels of water quality monitoring at D1b and D2a in September 2021 were referred only to the respective percentile of baseline data according to the Baseline Monitoring Report when insufficient water was available for sample collection.

3.20 Weather conditions during monitoring were mainly cloudy with sunny intervals. Summary of meteorological data is presented in Appendix G.

4. WASTE MANAGEMENT

4.1 An on-site environmental coordinator, i.e. Environmental Officer, has been employed by the Contractor to coordinate and supervise the project waste management works.

4.2 Waste arisen from the construction works are classified into the followings:

- Construction and demolition (C&D) material;
- Chemical waste; and
- General refuse.

4.3 Waste disposal record provided by the Contractor is summarized in Table 4.1.

Table 4.1 Summary of Waste Disposal

Reporting period	Quantity					
			Non-inert C&D Materials			
	Inert C&D Materials (in'000m^3)	Chemical Waste (in'000L)	Others, e.g. General Refuse disposed at Landfill (in'000m^3)	Recycled materials		
				Paper/card board (in'000kg)	Plastics (in'000kg)	Metals (in'000kg)
September 2021	5.6990	0	0.01292	0	0	0

4.4 The Monthly Summary Waste Flow Table is presented in **Appendix I**.

5. SITE INSPECTION

5.1 Joint weekly site inspections were conducted by representative of ET, Contractor and Engineer so as to monitoring the implementation of proper environmental pollution control and mitigation measures. Four (4) site inspections were performed in the reporting period.

5.2 One joint site inspection with IEC was also undertaken on 7 September 2021. Minor deficiencies were observed during weekly site inspection. Inspection findings are summarized in Table 5.1.

Table 5.1 Weekly Inspection Findings

Date	Location	Observation(s)	Follow-up Status
7 September 2021	KBR	No environmental deficiency was observed.	N.A.
17 September 2021	LSMR	No environmental deficiency was observed.	N.A.
23 September 2021	KBR	No environmental deficiency was observed.	N.A.
28 September 2021	LSMR	1. Oil stains should be cleaned up immediately.	1. Oil stains were cleaned up.

6. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

6.1 No exceedance was recorded for water quality and noise monitoring in the reporting period.

6.2 There was no environmental related complaint received in the reporting period.

6.3 There was no notification of summon and successful prosecution for breaches of current environmental protection/pollution control legislation in the reporting period.

6.4 The Cumulative statistics on complaints, notifications of summons and successful prosecutions is presented in **Appendix L**.

7. IMPLEMENTATION STATUS OF MITIGATION MEASURES

7.1 The Contractor has been implementing environmental mitigation measures set out in the approved EM&A Manual subject to the actual site condition. The implementation schedule is presented in **Appendix J**. Mitigation measures generally implemented by the Contractor in the reporting period are summarized in Table 7.1.

Table 7.1 Implemented Environmental Mitigation Measures in the Reporting Period

Environmental Aspect	Mitigation Measures Implemented
Air Quality	• Water spraying at works area before, during and after operation • Restricting heights from which materials were to be dropped • All vehicles were washed to remove dusty materials immediately before leaving the site • Erection of hoarding of not less than 2.4m in height • Covering dusty materials stockpile entirely with impervious tarpaulin • Spraying dusty materials with water immediately prior to any loading, unloading or transfer operation
Construction Noise	• The Contractor had been submitting method statement to the Engineer Representative for the approval of working method, equipment and noise mitigation measures to be used before commencing any work • Unused equipment was switched off • Regular maintenance of plants and equipment
Water Quality	• Provision of desilting facilities within works area capable of controlling discharge of SS to comply with WPCO/TM-DSS • Preparing of Contingency Plan which detailing the response and procedures when there was accidental spillage • Provision of channels, earth bunds and sand bags barriers for directing surface runoff to desilting facilities • Existing manholes were covered • Portable chemical toilets were provided on-site and licensed contractor was employed for the collection and disposal process • Two layers of silt curtain were deployed to separate the works area from water gathering ground • Oil and grease removal materials were provided • Exposed slopes were either shotcreted or covered by impervious tarpaulin

Waste Management	• Provision of on-site coordinator for waste management • Excavated material was reused on site as far as practicable to minimize off-site disposal • Sorting of waste materials into inert/non-inert type on-site • Trip Ticket System was implemented for control of C&D waste disposal • Covered bins were provided for the containment of general refuse • Toolbox talks were provided to workers for enhancing their awareness
Ecology	• Clear definition of site boundary was provided • *Pavetta hongkongensis* had been transplanted on-site • Eating, leaving food and feeding wildlife are forbidden in works area • Fishing was forbidden in works area • Litter was removed off-site regularly • Unused equipment was switched off
Landscape and Visual	• Retained trees were protected • Hoarding erected was compatible with surrounding setting
Cultural Heritage	• Condition survey was conducted prior to the commencement of construction • Vibration monitoring had been implemented in accordance with recommendations in the condition survey report

8. ENVIRONMENTAL FORECASTING

8.1 As advised by the Contractor, major construction works to be performed in the next reporting month, i.e., October 2021, include the followings:

Works Area	Major Site Activities
Portion A & D	• Pipe piling works
Portion C	• Mined tunnel construction works

8.2 The Contractor is reminded to properly implement mitigation measures for each specified works. The Contractor should also carefully program the drainage diversion and TBM launching platform works so as to critically protect the water gathering ground of LSMR during construction.

8.3 Tentative schedule of impact construction noise and water quality monitoring for the next reporting month, i.e., October 2021, is presented in **Appendix K**. Monitoring will be performed at same locations presented in above sections.

9. CONCLUSION AND RECOMMENDATIONS

9.1 This is the 27th Monthly Environmental Monitoring and Audit (EM&A) Report presents EM&A works undertaken in the period of 1 to 30 September 2021. EM&A works were performed in accordance with the approved EM&A Manual and conditions stipulated in the amended Environmental Permit EP-345/2009/A.

9.2 Impact monitoring for construction noise and water quality were performed in the reporting period.

9.3 The control points C1b and C2 were observed with very shallow flow on all sampling days in September 2021. Insufficient water was available for sample collection.

9.4 Similar to predictions from the EIA report, no project-related exceedance was identified from the EM&A programme of the reporting month.

9.5 As per Section 10.3.3 of the EM&A Manual, the number and location of monitoring stations and parameters were reviewed. No significant change was observed on the surrounding environment (i.e., no new stream or water way, no new sensitive receiver and no better alternative monitoring locations which suit the descriptions in Section 5.4.2 of the EM&A Manual) or the nature of works in progress. The current monitoring locations remain to be representative; the current water quality control monitoring locations are the nearest upstream accessible stream before passing through the construction site and merging with the water body; and the current monitoring parameters have covered the possible environmental impact arising from the nature of works in progress. No change is suggested to be made to the current EM&A programme. No change in surrounding environment and nature of works in progress was noted from the Contractor and Supervisor.

9.6 Weekly site inspections were performed during the reporting period.

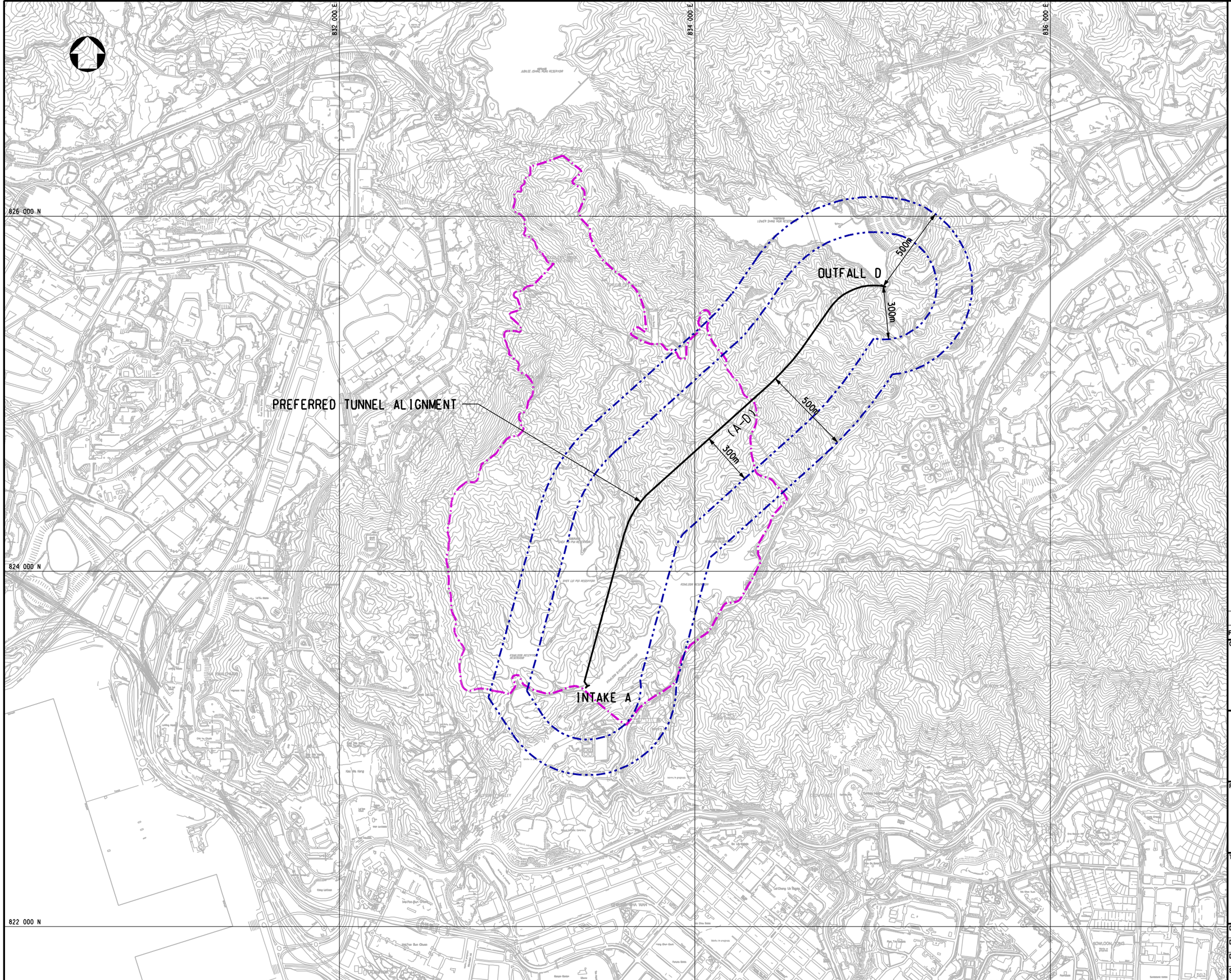
9.7 No complaint regarding environmental issue was received in the reporting period.

9.8 No notification of summons nor prosecution have been received since the commencement of the Project.

9.9 The Contractor is reminded that all works to be undertaken within the water gathering ground of LSMR and KBR must fulfill statutory environmental requirements, especially in watercourse protection.

9.10 Maintenance walkway connecting Cheung Yuen Road and intake structure, which were not shown in the EIA Report (AEIAR-135/2009), were observed inside the site boundary at the KBR area. Such structures shall be included in the latest Landscape Plan for authorities' approval.

Appendix A
Project Site Layout Plan



LEGEND:

KAM SHAN COUNTRY PARK BOUNDARY

STUDY AREA

Rev	Date	Drawn	Description	Ch'k'd	App'd

Client

THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION WATER SUPPLIES DEPARTMENT

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Project

Agreement No. CE55/2006(EP)
Inter-reservoirs Transfer Scheme (IRTS)
Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Environmental Impact Assessment Investigation

Title

THE PREFERRED SCHEME

Designed	HN/PW		Eng.Chk.	PW	
Drawn	VN		Coordination	PW	
Dwg.Chk.	HN		Approved	AFK	

Scale 1:10000@A1

Project 240564

CAD File J:\240564\REPORT\ENV\EM&A-08I21\FIGURE-1-1.dgn

Status INF

Drawing No. FIGURE 1-1

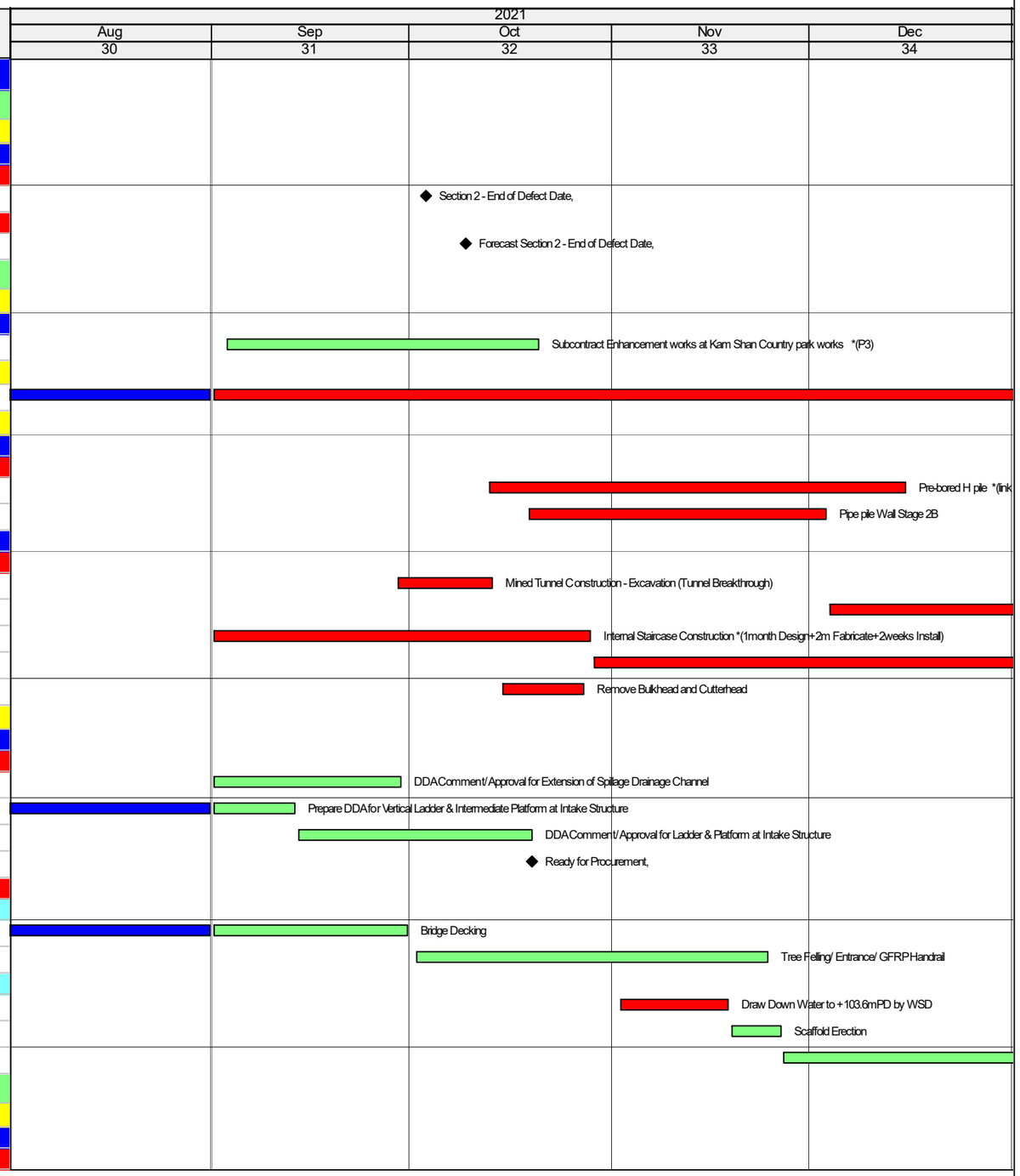
Rev

Appendix B
Latest Construction Programme

IRTS: 3 Month Rolling Programme (Sep 21 ~ Nov 21)

Layout : 4 -IRT-Rolling Y21M08D31a
TASK filters: 3 Month Rolling, Level of Effort.
Data Date : 31-Aug-21

Activity ID	Activity Name	Dur	Start	Finish
IRTS - Rolling Programme (Y21M09D01a)				
Contract Dates				
Project Completion				
Defect Dates				
Contract Provision				
DLP_S2_1010	Section 2 - End of Defect Date	0		03-Oct-21*
Forecast				
DLP_S2_1020	Forecast Section 2 - End of Defect Date	0		09-Oct-21*
Preliminaries and General Requirements				
Procurement of Consultants and Sub-Contractors				
Sub-Contractors				
Pro_SCon_1700	Subcontract Enhancement works at Kam Shan Country park works *(P3)	38	03-Sep-21	20-Oct-21
Tai Po Road Site (TGLA No. TST453)				
TPR_GW-1040	General Site Storage	891	02-Jul-19A	22-Aug-22
CSD Submission				
CSD 1 - Outfall Structure				
Alternative Works (Subject to approval of Structure Design)				
CSD1_OF_1000	Pre-bored H pile *(link changed: erector removal to concurrent gripper dismantle)	54	13-Oct-21	15-Dec-21
CSD1_OF_3000	Pipe pile Wall Stage 2B	40	19-Oct-21	03-Dec-21
CSD 2 - Alternative Alignment & Intake Structure				
Alternative Works (Subject to approval of alternative tunnel alignment)				
CSD_PF_2210-20	Mined Tunnel Construction - Excavation (Tunnel Breakthrough)	12	29-Sep-21	13-Oct-21
CSD_PF_2210-30	Mined Tunnel Construction - Lining	43	04-Dec-21	26-Jan-22
CSD_PF_2225	Internal Staircase Construction *(1month Design+2m Fabricate+2weeks Install)	47	01-Sep-21	28-Oct-21
CSD_PF_2230	E&M Installation	79	29-Oct-21	08-Feb-22
TB_Ds_1600	Remove Bulkhead and Cutterhead	11	15-Oct-21	27-Oct-21
Compensation Event CE-054/ CE-056)				
Feasibility Study & DDA for Maintenance Walkway at KBR (CE-054 & CE-056)				
Design Submissions				
CE054-2120	DDA Comment/ Approval for Extension of Spillage Drainage Channel	24	01-Sep-21	29-Sep-21
CE054-2180	Prepare DDA for Vertical Ladder & Intermediate Platform at Intake Structure	167	18-Jan-21 A	13-Sep-21
CE054-2190	DDA Comment/ Approval for Ladder & Platform at Intake Structure	28	14-Sep-21	19-Oct-21
CE054-2210	Ready for Procurement	0		19-Oct-21
CE-056 Construction Works at KBR				
KBR Maintenance Access				
CE056-2030	Bridge Decking	84	23-Jun-21 A	30-Sep-21
CE056-2050	Tree Felling/ Entrance/ GFRP Handrail	45	02-Oct-21	24-Nov-21
Spillage Channel				
CE056-3010	Draw Down Water to +103.6mPD by WSD	15	02-Nov-21*	18-Nov-21
CE056-3020	Scaffold Erection	7	19-Nov-21	26-Nov-21
CE056-3030	Rock Breaking for Formation	30	27-Nov-21	04-Jan-22
Tunneling Works				
Design Submission				
Mined Tunnel Temporary Works Design				
KBR Mined Tunnel				



Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

Contract No. DC/2018/08 : Inter-Reservoirs Transfer Scheme
Water Tunnel Between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir

Date	Revision	Checked	Approved
24-Aug-21	Rolling Y21M08D24a	A.Tsang	
31-Aug-21	Rolling Y21M08D31a	A.Tsang	

IRTS: 3 Month Rolling Programme (Sep 21 ~ Nov 21)

Layout : 4 -IRT-Rolling Y21M08D31a
TASK filters: 3 Month Rolling, Level of Effort.
Data Date : 31-Aug-21

Activity ID	Activity Name	Dur	Start	Finish
MTD_KB_4000	Review and Acceptance (GEO)	18	27-Aug-21 A	16-Sep-21
Mined Tunnel Permanent Works Design				
MTD_KB_4020	Review and Comments	18	02-Sep-21	23-Sep-21
MTD_KB_4030	2nd Submission - Mined Tunnel Design Preparation & Submission with ICE	20	24-Sep-21	19-Oct-21
MTD_KB_4040	Review and Acceptance	15	20-Oct-21	05-Nov-21
Site Works				
LSMR (North Portal) & TBM				
LSMR : TBM Tunnel Excavation				
TBM Excavation				
TBM_Exc_2800	CH2686 to CH2951 to CH2973.935	20	03-Sep-21	25-Sep-21
TBM Dismantling				
TB_Ds_1000	Pull Back Gantries 1-13	14	26-Sep-21	09-Oct-21
TB_Ds_1010	Noise Enclosure Removal	18	27-Sep-21	19-Oct-21
TB_Ds_1100	Remove Erector	4	10-Oct-21	13-Oct-21
TB_Ds_1200	Dismantle from inside Tailskin (ie rams)	5	14-Oct-21	18-Oct-21
TB_Ds_1300	Dismantle Within Gripper Shield	6	19-Oct-21	24-Oct-21
TB_Ds_1400	Dismantle Within Shield and Telescopic	6	25-Oct-21	30-Oct-21
TB_Ds_1500	Remove Main Drive	4	31-Oct-21	03-Nov-21
TB_Ds_1700	Tunnel Services Removal and Tunnel Cleaning	30	04-Nov-21	03-Dec-21
Intake Structure at Kowloon Byewash Reservoir				
KBR Intake : E&M for Electric Actuated Penstocks and Automatic Flow Control System				
KBR Intake : E&M Installation of Automatic Flow Control System & Others				
KB_ISW_3600	Supply and Delivery of E&M Materials / Equipments *(P1a)	120	11-Aug-21 A	04-Jan-22
KB_ISW_3610	Excavation Permit Application & Works for Power Supply Cables	77	13-Sep-21	14-Dec-21
KBR Intake : E&M Installation of Electrical Actuated Penstocks				
KB_ISW_3830	Penstock Installation (2nos.) *(P1a)	56	11-Aug-21 A	18-Oct-21
KB_ISW_3840	Testing and Commissioning of Penstock *(P1a)	26	19-Oct-21	17-Nov-21
KBR Intake : E&M Design for Lifting Crane				
KBR_EMD_1370	2nd Submission -Lifting Crane Design Preparation & Submission with ICE	28	11-Sep-21	16-Oct-21
KBR_EMD_1380	Review and Acceptance	18	18-Oct-21	06-Nov-21
KBR Intake : E&M Installation of Lifting Crane				
KB_ISW_3850	Supply and Delivery of Lifting Crane *(P1a)	56	08-Nov-21	14-Jan-22
Outfall Structure at Lower Shing Mun Reservoir (Conforming Design)				
LSMR Outfall : Design Submission				
LSMR Outfall : Stage 2B Pipe Pile Wall for Outfall				
LSM_OSD_1300	Review and Acceptance	63	13-Mar-21 A	28-Sep-21
LSMR Stage 1 - C&C Tunnel.				
LSM_OSW_1100	Construct C&C Tunnel	24	04-Dec-21	04-Jan-22
LSMR Stage 2 - Outfall Structure & Remaining C&C Tunnel.				
LSMR Outfall Excavation				
LSM_OSW_1380	Pipe Pile Wall Stage 2B (180 Piles/3 rigs/ 6 piles/day)	40	13-Oct-21	29-Nov-21
LSM_OSW_1400	Excavation, waler and strut installation 1st layer	17	30-Nov-21	18-Dec-21
Slope Upgrading Works				
KBR Slope Stabilization Works.				
KBR_Slp_Slp_0990	Dry Season Start	0	01-Nov-21*	

Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

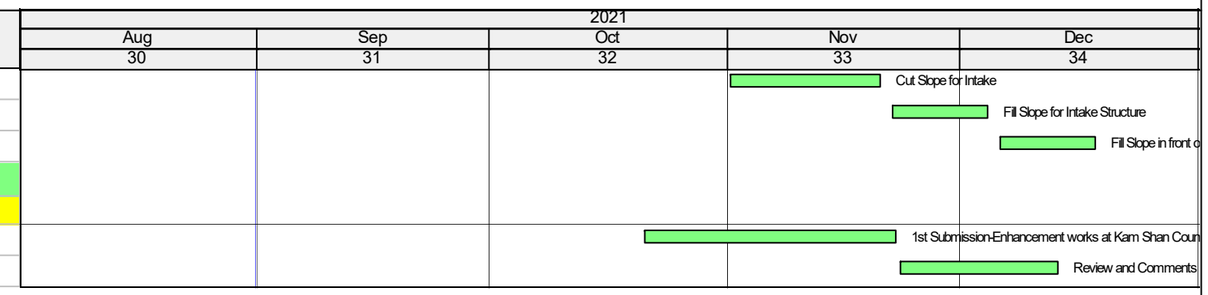
Contract No. DC/2018/08 : Inter-Reservoirs Transfer Scheme
Water Tunnel Between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir

Date	Revision	Checked	Approved
24-Aug-21	Rolling Y21M08D24a	A.Tsang	
31-Aug-21	Rolling Y21M08D31a	A.Tsang	

IRTS: 3 Month Rolling Programme (Sep 21 ~ Nov 21)

Layout : 4 -IRT-Rolling Y21M08D31a
TASK filters: 3 Month Rolling, Level of Effort.
Data Date : 31-Aug-21

Activity ID	Activity Name	Dur	Start	Finish
KBR_Slp_Slp_1000.	Cut Slope for Intake	18	01-Nov-21*	20-Nov-21
KBR_Slp_Slp_1100.	Fill Slope for Intake Structure	12	22-Nov-21	04-Dec-21
KBR_Slp_Slp_1200.	Fill Slope in front of Structure	12	06-Dec-21	18-Dec-21
Landscaping Works				
Enhancement Works of Kam Shan Country Park-Design				
KBR_EhW_1300	1st Submission-Enhancement works at Kam Shan Country Park-Design Preparation & Submission *(P1c)	28	21-Oct-21	22-Nov-21*
KBR_EhW_1400	Review and Comments *(P1c)	18	23-Nov-21	13-Dec-21

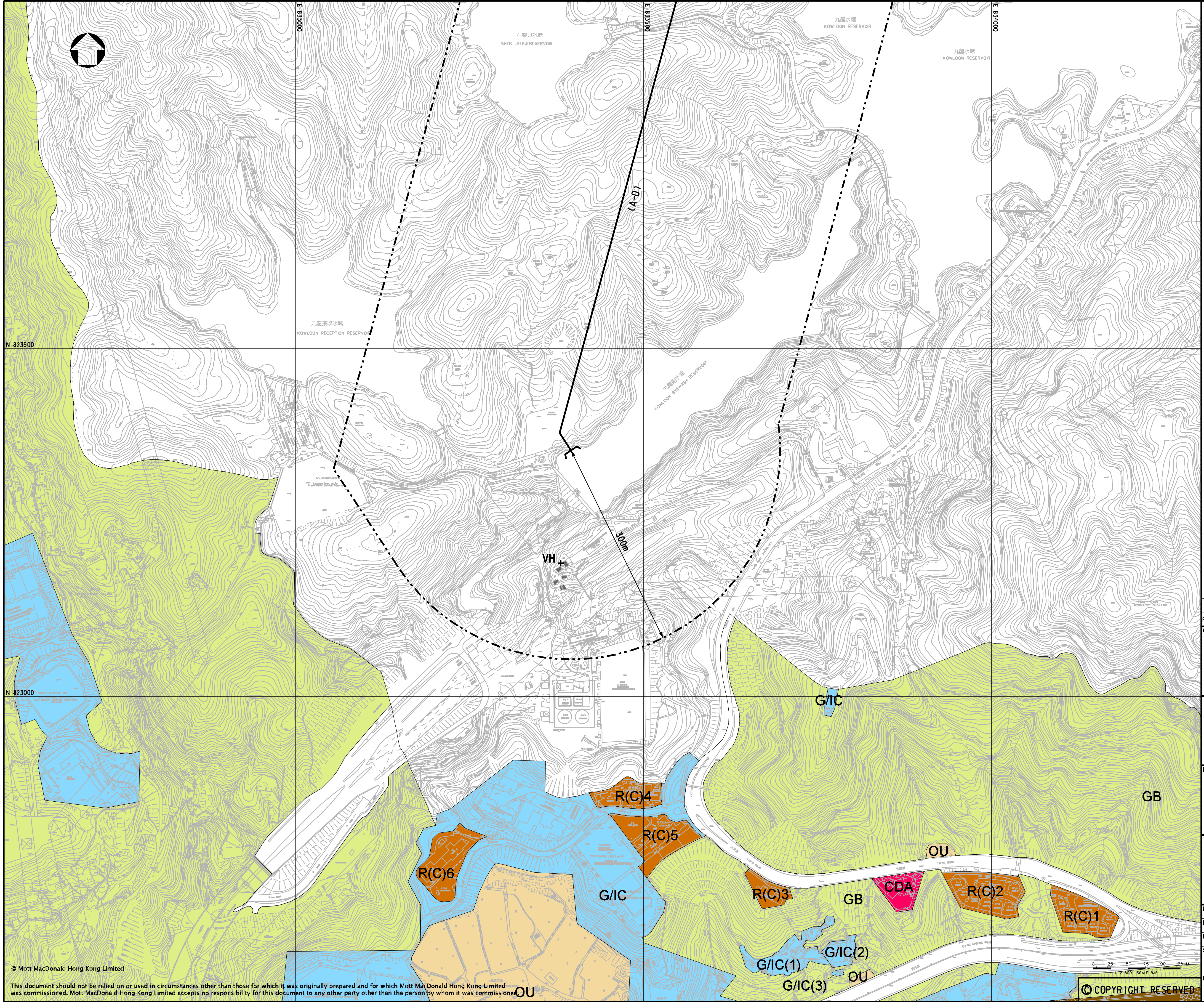


Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

Contract No. DC/2018/08 : Inter-Reservoirs Transfer Scheme
Water Tunnel Between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir

Date	Revision	Checked	Approved
24-Aug-21	Rolling Y21M08D24a	A.Tsang	
31-Aug-21	Rolling Y21M08D31a	A.Tsang	

Appendix C
Monitoring Locations



LEGEND:

- STUDY AREA BOUNDARY
- PREFERRED TUNNEL ALIGNMENT
- + NOISE SENSITIVE RECEIVER
- C COMMERCIAL
- CDA COMPREHENSIVE DEVELOPMENT AREA
- G/IC GOVERNMENT/INSTITUTION/COMMUNITY
- GB GREEN BELT
- I INDUSTRIAL
- O OPEN SPACE
- OU OTHER SPECIFIED USES
- R(A) RESIDENTIAL (GROUP A)
- R(B) RESIDENTIAL (GROUP B)
- R(C) RESIDENTIAL (GROUP C)
- R(E) RESIDENTIAL (GROUP E)
- V VILLAGE TYPE DEVELOPMENT

Rev	Date	Drawn	Description	Ch'k'd	App'd

Client

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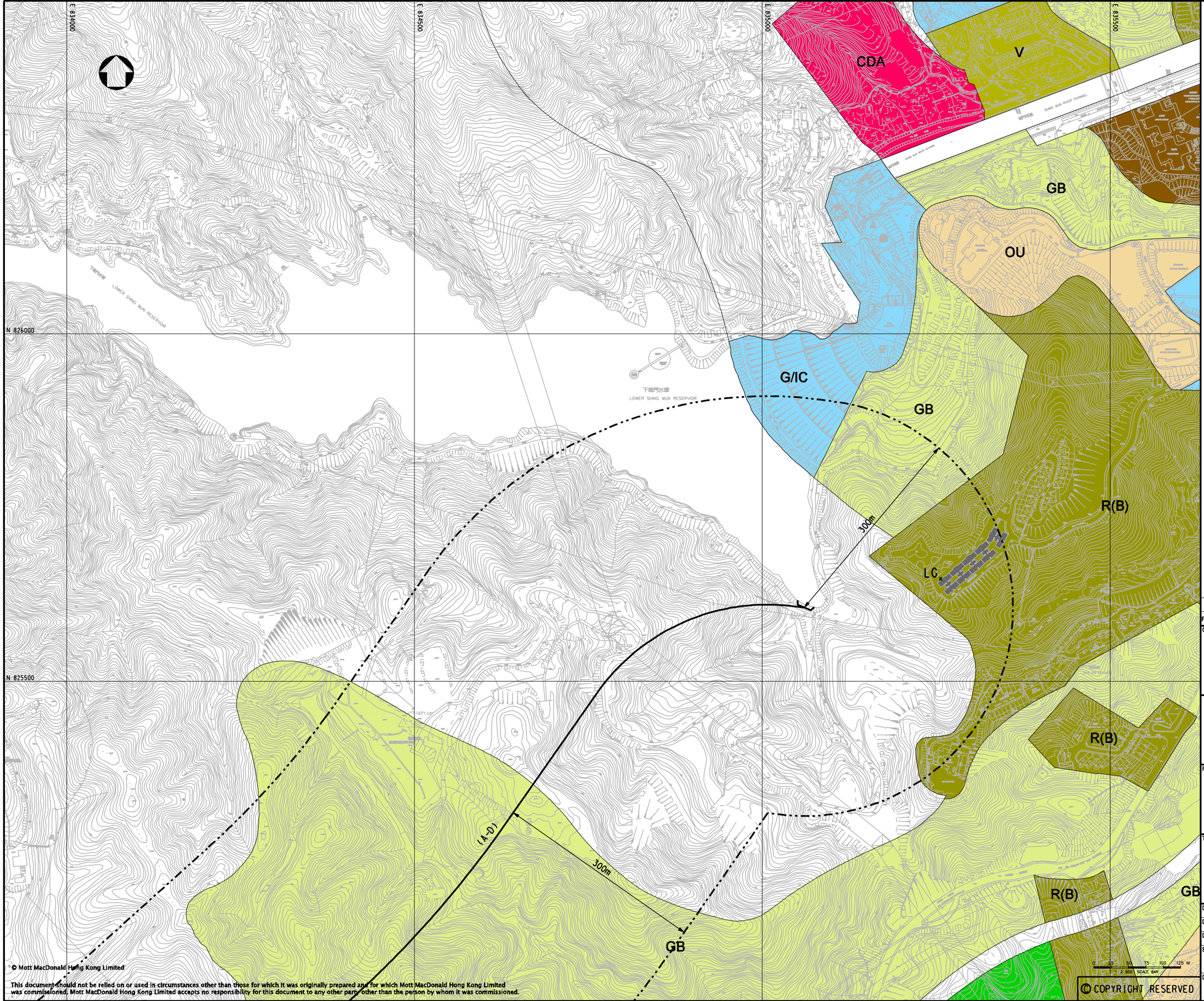
Project

Agreement No. CE55/2006(EP)
Inter-reservoirs Transfer Scheme (IRTS)
Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Environmental Impact Assessment Investigation

Title

THE STUDY AREA AND REPRESENTATIVE NSRs (INTAKE END)

Designed	HN/PW	Eng.Chk.	PW
Drawn	VN	Coordination	PW
Dwg.Chk.	HN	Approved	AFK
Scale 1:2500@A1	Project 240564	CAD File J:\240564\REPORT\ENV\EM&A-0812\FIGURE-4-1.dgn	Status INF
Drawing No. FIGURE 4-1		Rev	



Rev	Date	Drawn	Description	Ch'k'd	App'd

Client

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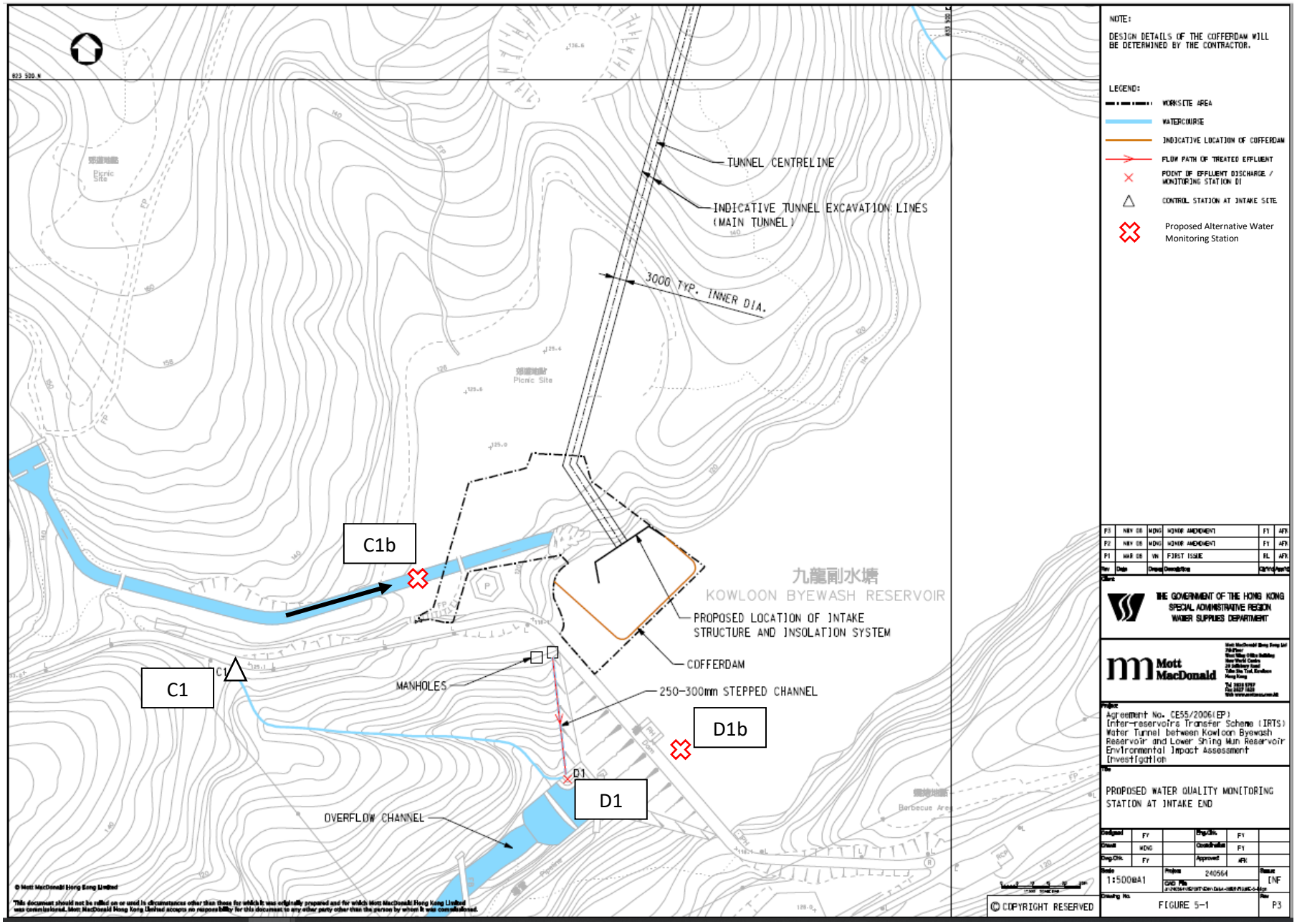
Project

Agreement No. CE55/2006(EP)
Inter-reservoirs Transfer Scheme (IRTS)
Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Environmental Impact Assessment Investigation

Title

PROPOSED LOCATION OF NOISE MONITORING STATION AT OUTFALL END

Designed	HN/PW		Eng.Chk.	PW	
Drawn	VN		Coordination	PW	
Dwg.Chk.	HN		Approved	AFK	
Scale	1:2500@A1	Project	240564		Status INF
		CAD File	j:\240564\report\env\em&a-0812\FIGURE-4-2.dgn		
Drawing No.	FIGURE 4-2				Rev


NOTE:
DESIGN DETAILS OF THE COFFERDAM WILL BE DETERMINED BY THE CONTRACTOR.
LEGEND:
WORKSITE AREA
WATERCOURSE
INDICATIVE LOCATION OF COFFERDAM
FLOW PATH OF TREATED EFFLUENT
POINT OF EFFLUENT DISCHARGE / MONITORING STATION D1
CONTROL STATION AT INTAKE SITE
Proposed Alternative Water Monitoring Station
TUNNEL CENTRELINE
INDICATIVE TUNNEL EXCAVATION LINES (MAIN TUNNEL)
3000 TYP. INNER DIA.
C1b
C1
九龍副水塘
KOWLOON BYEWASH RESERVOIR
PROPOSED LOCATION OF INTAKE STRUCTURE AND INSOLATION SYSTEM
COFFERDAM
MANHOLES
250-300mm STEPPED CHANNEL
D1b
D1
OVERFLOW CHANNEL
Picnic Site
Barbecue Area
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
WATER SUPPLIES DEPARTMENT
Mott MacDonald
Agreement No. CE55/2006(EP)
Inter-reservoirs Transfer Scheme (IRTS)
Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Environmental Impact Assessment
Investigation
PROPOSED WATER QUALITY MONITORING STATION AT INTAKE END
1:5000@A1
240564
FIGURE 5-1
P3
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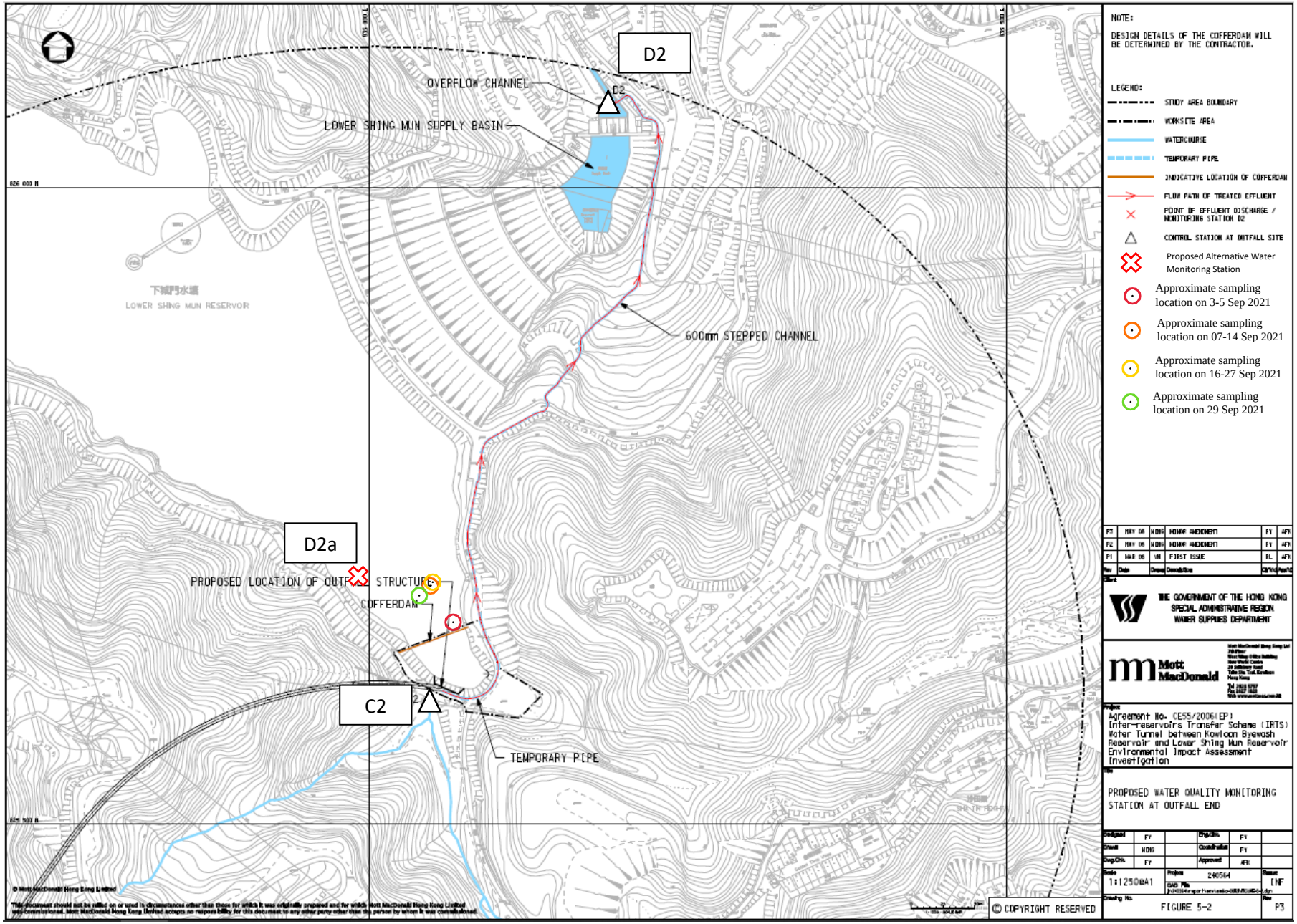
D2
OVERFLOW CHANNEL
D2
LOWER SHING MUN SUPPLY BASIN
下城門水塘
LOWER SHING MUN RESERVOIR
600mm STEPPED CHANNEL
D2a
PROPOSED LOCATION OF OUTF
STRUCTURE
COFFERDAM
C2
TEMPORARY PIPE
NOTE:
DESIGN DETAILS OF THE COFFERDAM WILL BE DETERMINED BY THE CONTRACTOR.
LEGEND:
STUDY AREA BOUNDARY
WORKSITE AREA
WATERCOURSE
TEMPORARY PIPE
INDICATIVE LOCATION OF COFFERDAM
FLOW PATH OF TREATED EFFLUENT
POINT OF EFFLUENT DISCHARGE / MONITORING STATION D2
CONTROL STATION AT OUTFALL SITE
Proposed Alternative Water Monitoring Station
Approximate sampling location on 3-5 Sep 2021
Approximate sampling location on 07-14 Sep 2021
Approximate sampling location on 16-27 Sep 2021
Approximate sampling location on 29 Sep 2021
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
WATER SUPPLIES DEPARTMENT
Mott MacDonald
Agreement No. CE55/2006(EP)
Inter-reservoirs Transfer Scheme (IRTS)
Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Environmental Impact Assessment Investigation
PROPOSED WATER QUALITY MONITORING STATION AT OUTFALL END
1:1250@A1
240564
FIGURE 5-2
P3
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Appendix D
Calibration Certificates of Equipment Used

N4
73784

Certificate of Calibration

for

Description:	*Sound Level Meter*
Manufacturer:	*NTi*
Type No.:	*XL2 (Serial No.: A2A-13661-E0)*
Microphone:	*ACO 7052 (Serial No.: 73784)*
Preamplifier:	*NTi Audio MA220 (M2211) (Serial No.:6282)*
	Submitted by:
Customer:	***Acuity Sustainability Consulting Limited***
Address:	***Unit C, 11/F, Ford Glory Plaza, No. 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon***

Upon receipt for calibration, the instrument was found to be:

☑ **Within**
☐ **Outside**

the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 22 September 2020

Date of calibration: 23 September 2020

Calibrated by: _____ *Calibration Technician*

Certified by: _____ *Mr. Tang Cheuk Hang*
Quality Manager

Date of issue: 23 September 2020

ACOUSTICS AND AIR TESTING LABORATORY CO. LTD. (A+A)*L

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

1. *Calibration Precaution:*

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

- The results presented are the mean of 3 measurements at each calibration point.

2. *Calibration Conditions:*

Air Temperature:	24.9 **°C**
Air Pressure:	1006 **hPa**
Relative Humidity:	64.5 **%**

3. *Calibration Equipment:*

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV200041	HOKLAS

4. *Calibration Results*

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
40-140	dBA SPL	Fast	94	1000	94.0	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	Ref
			104		104.0	±0.3
			114		114.1	±0.3

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	Ref
		Slow			94.0	±0.3

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Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dB SPL	Fast	94	31.5	94.3	±2.0
				63	94.2	±1.5
				125	94.2	±1.5
				250	94.1	±1.4
				500	94.1	±1.4
				1000	94.0	Ref
				2000	94.2	±1.6
				4000	94.9	±1.6
				8000	94.9	+2.1; -3.1

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	31.5	54.9	-39.4 ±2.0
				63	68.0	-26.2 ±1.5
				125	78.1	-16.1 ±1.5
				250	85.5	-8.6 ±1.4
				500	90.9	-3.2 ±1.4
				1000	94.0	Ref
				2000	95.4	+1.2 ±1.6
				4000	95.9	+1.0 ±1.6
				8000	93.8	-1.1+2.1; -3.1

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBC SPL	Fast	94	31.5	91.3	-3.0 ±2.0
				63	93.4	-0.8 ±1.5
				125	94.0	-0.2 ±1.5
				250	94.1	-0.0 ±1.4
				500	94.1	-0.0 ±1.4
				1000	94.0	Ref
				2000	94.1	-0.2 ±1.6
				4000	94.1	-0.8 ±1.6
				8000	92.9	–3.0 +2.1: –3.1

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

5. *Calibration Results Applied*

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.05
	63 Hz	± 0.05
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:
The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail: inquiry@aa-lab.com

Certificate of Calibration

for

Description:	*Sound Level Meter*
Manufacturer:	*NTi Audio*
Type No.:	*XL2 (Serial No.: A2A-17638-E0)*
Microphone:	*ACO 7052 (Serial No.:68746)*
Preamplifier:	*NTi Audio M2211 MA220 (Serial No.:7014)*

Submitted by:

Customer:	*Acuity Sustainability Consulting Limited*
Address:	*Unit C, 11/F., Ford Glory Plaza, No. 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon*

Upon receipt for calibration, the instrument was found to be:

☑ **Within**
☐ **Outside**

the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 22 March 2021

Date of calibration: 24 March 2021

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 24 March 2021

ACOUSTICS AND AIR TESTING LABORATORY CO LTD (A+A)*L

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

1. *Calibration Precaution:*

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

- The results presented are the mean of 3 measurements at each calibration point.

2. *Calibration Conditions:*

Air Temperature:	23.2 °C
Air Pressure:	1006 hPa
Relative Humidity:	57.6 %

3. *Calibration Equipment:*

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV200041	HOKLAS

4. *Calibration Results*

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.1	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.1	Ref
			104		104.1	±0.3
			114		114.1	±0.3

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.1	Ref
		Slow			94.1	±0.3

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Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dB SPL	Fast	94	31.5	94.1	±2.0
				63	94.2	±1.5
				125	94.2	±1.5
				250	94.1	±1.4
				500	94.2	±1.4
				1000	94.1	Ref
				2000	94.3	±1.6
				4000	94.6	±1.6
				8000	92.8	+2.1; -3.1

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	31.5	54.7	-39.4 ±2.0
				63	68.0	-26.2 ±1.5
				125	78.1	-16.1 ±1.5
				250	85.5	-8.6 ±1.4
				500	91.0	-3.2 ±1.4
				1000	94.1	Ref
				2000	95.5	+1.2 ±1.6
				4000	95.6	+1.0 ±1.6
				8000	91.8	-1.1+2.1; -3.1

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBC SPL	Fast	94	31.5	91.1	-3.0 ±2.0
				63	93.3	-0.8 ±1.5
				125	94.0	-0.2 ±1.5
				250	94.1	-0.0 ±1.4
				500	94.2	-0.0 ±1.4
				1000	94.1	Ref
				2000	94.1	-0.2 ±1.6
				4000	93.8	-0.8 ±1.6
				8000	89.8	–3.0 +2.1: –3.1

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Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

5. *Calibration Results Applied*

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.10
	63 Hz	± 0.05
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:
The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.

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Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	7-Aug-2021	**Certificate Number**	MLCN212053S

Customer Information

Company Name	Acuity Sustainability Consulting Limited
Address	Unit C, 11/F., Ford Glory Plaza, Nos. 37-39 Wing Hing Street, Cheung Sha Wan, Kowloon, HK

Equipment-under-Test (EUT)

Description	Acoustic Calibrator
Manufacturer	Pulsar
Model Number	105
Serial Number	63705
Equipment Number	--

Calibration Particular

Date of Calibration	7-Aug-2021		
Calibration Equipment	4231(MLTE008) / AV200063 / 23-Jun-23 1357(MLTE190) / MLEC21/05/02 / 26-May-22		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.		

Approved By & Date

K.O. Lo 7-Aug-2021

Statements

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

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MaxLab Calibration Centre Limited
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B 室
Unit B, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

MAXLAB

Certificate No. MLCN212053S

Calibration Data

EUT Setting	Standard Reading	EUT Error from Setting	Calibration Uncertainty	EUT Specification
94 dB	93.9 dB	-0.1 dB	0.20 dB	± 0.2 dB

- END -

Calibrated By : Keneth
Date : 7-Aug-21

Checked By : K.O. Lo
Date : 7-Aug-21

萬儀校正中心有限公司
MaxLab Calibration Centre Limited
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B 室
Unit B, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	20-Mar-2021	**Certificate Number**	MLCN210569S

Customer Information

Company Name	Acuity Sustainability Consulting Limited
Address	Unit C, 11/F., Ford Glory Plaza, Nos. 37-39 Wing Hing Street, Cheung Sha Wan, Kowloon, HK

Equipment-under-Test (EUT)

Description	Sound Calibrator
Manufacturer	Svantek
Model Number	SV 33B
Serial Number	83042
Equipment Number	--

Calibration Particular

Date of Calibration	20-Mar-2021		
Calibration Equipment	4231(MLTE008) / AV200063 / 23-Jun-23 1357(MLTE190) / MLEC20/05/02 / 26-May-21		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.		

Approved By & Date

K.O. Lo 20-Mar-2021

Statements

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

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Unit B, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

Certificate No. MLCN210569S

Calibration Data

EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
114 dB	114.0 dB	0.0 dB	0.15 dB	± 0.3 dB

- END -

Calibrated By : Dan
Date : 20-Mar-21

Checked K.O. Lo
Date : 20-Mar-21

萬儀校正中心有限公司
MaxLab Calibration Centre Limited
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B 室
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專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED
Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong
Email: info@qualityprotest.com; Website: www.qualityprotest.com
Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA080063
Date of Issue : 19 August 2021

PART A – CUSTOMER INFORMATION

Acuity Sustainability Consulting Limited
Unit C, 11/F, Ford Glory Plaza
37-39 Wing Hong Street
Cheung Sha Wan, Kowloon, Hong Kong
Attn: Mr. Nelson TSUI

PART B – DESCRIPTION

Name of Equipment	:	Multi Water Quality Checker U-53
Manufacturer	:	Horiba
Serial Number	:	NEKVM2XU
Date of Received	:	Aug 13, 2021
Date of Calibration	:	Aug 16, 2021
Date of Next Calibration[a]	:	Nov 15, 2021

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	4.10	0.10	Satisfactory
7.42	7.40	-0.02	Satisfactory
10.01	10.00	-0.01	Satisfactory

Tolerance of pH should be less than ±0.20 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
15	15.27	0.27	Satisfactory
27	26.98	-0.02	Satisfactory
34.1	34.85	0.75	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.
(b) The results relate only to the calibrated equipment as received
(c) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
(e) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

LEE Chun-ning, Desmond
Senior Chemist

專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED
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Email: info@qualityprotest.com; Website: www.qualityprotest.com
Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA080063
Date of Issue : 19 August 2021

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
1.35	1.61	0.26	Satisfactory
3.73	3.57	-0.16	Satisfactory
5.98	5.98	0.00	Satisfactory
7.74	7.64	-0.10	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.50 (mg/L)

(4) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	10.18	1.80	Satisfactory
20	21.26	6.30	Satisfactory
30	32.52	8.40	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(5) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	0.12	--	Satisfactory
10	10.2	2.0	Satisfactory
20	20.0	0.0	Satisfactory
100	101	1.0	Satisfactory
800	800	0.0	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

專業化驗有限公司
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Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA090020
Date of Issue : 08 September 2021

PART A – CUSTOMER INFORMATION

Acuity Sustainability Consulting Limited
Unit C, 11/F, Ford Glory Plaza
37-39 Wing Hong Street
Cheung Sha Wan, Kowloon, Hong Kong
Attn: Mr. Nelson TSUI

PART B – DESCRIPTION

Name of Equipment	:	YSI ProDSS Multi Parameters
Manufacturer	:	YSI
Serial Number	:	15M101091
Date of Received	:	Sep 03, 2021
Date of Calibration	:	Sep 06, 2021
Date of Next Calibration[a]	:	Dec 06, 2021

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	4.12	0.12	Satisfactory
7.42	7.51	0.09	Satisfactory
10.01	10.06	0.05	Satisfactory

Tolerance of pH should be less than ±0.20 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
15	14.9	-0.1	Satisfactory
28	27.5	-0.5	Satisfactory
34.5	34.2	-0.3	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

[a] *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
[b] *The results relate only to the calibrated equipment as received*
[c] *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
[d] *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
[e] *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.*

LEE Chun-ning
Senior Chemist

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Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.14	0.23	0.09	Satisfactory
2.60	2.53	-0.07	Satisfactory
4.57	4.56	-0.01	Satisfactory
7.55	7.32	-0.23	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.50 (mg/L)

(4) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.96	-0.40	Satisfactory
20	20.37	1.85	Satisfactory
30	31.17	3.90	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(5) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	-0.34	--	Satisfactory
10	10.23	2.3	Satisfactory
20	19.25	-3.8	Satisfactory
100	106.49	6.5	Satisfactory
800	849.67	6.2	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

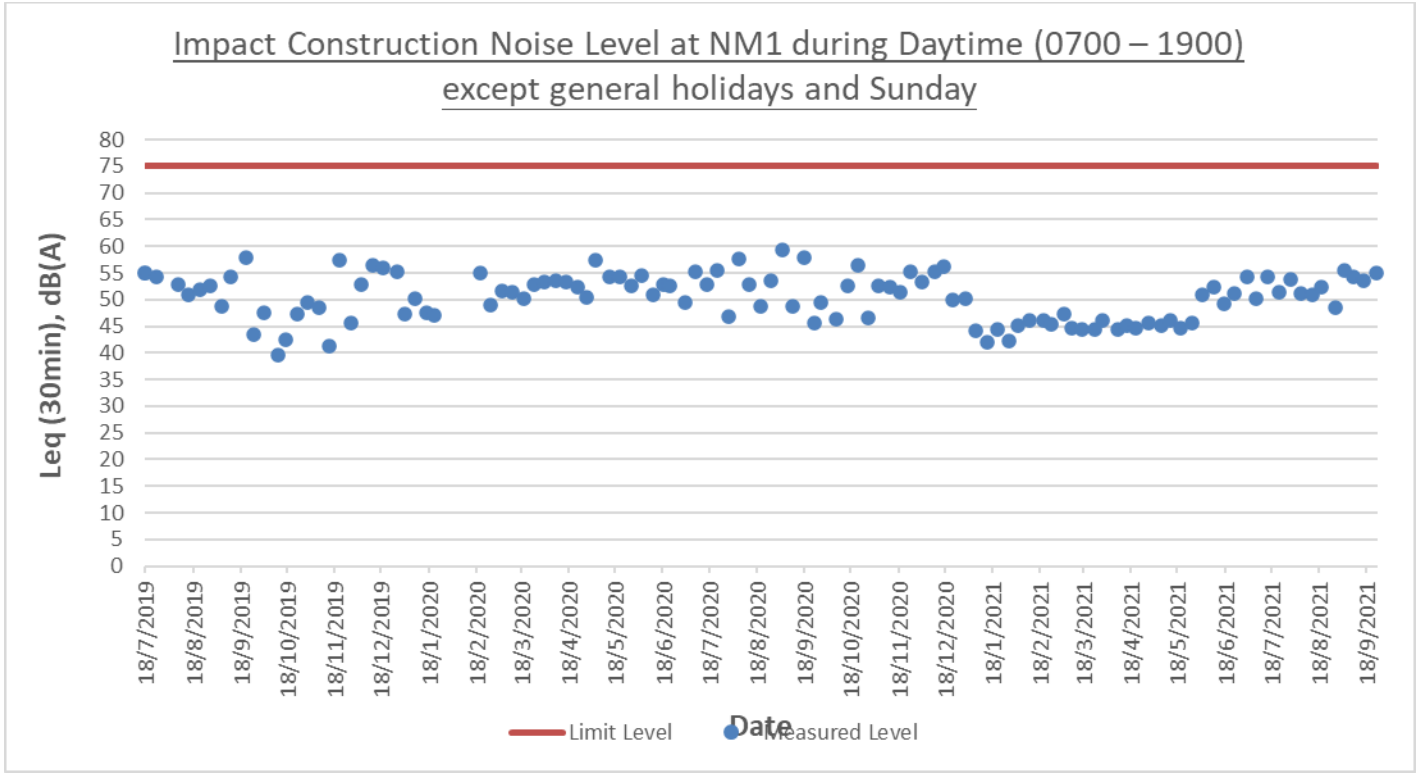
Appendix E
Impact Noise Monitoring Data

Impact Noise Monitoring Data

NM1 – Lakeview Garden

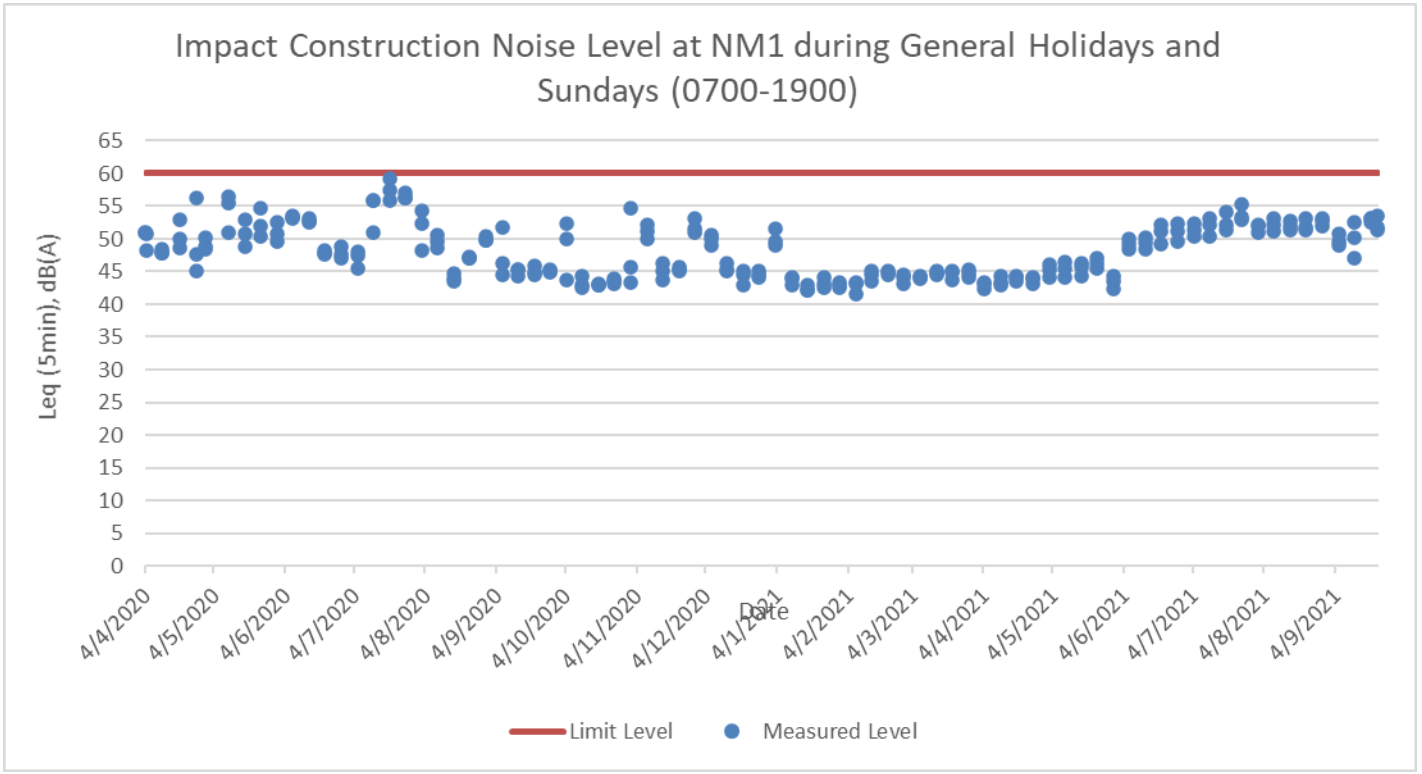
Daytime (0700 – 1900) except general holidays and Sunday

Date	Location	Time			Weather	$L_{eq\ (30min)}$	L_{10}	L_{90}	Wind Speed	Temperature
3/9/2021	NM1	11:30	-	12:00	Sunny	55.6	56.6	42.3	0.9 m/s	29.1 ˚C
9/9/2021	NM1	9:50	-	10:20	Sunny	54.3	56.1	45.3	0.4 m/s	30.5 ˚C
16/9/2021	NM1	8:55	-	9:25	Sunny	53.6	55.4	43.1	1.3 m/s	29.1 ˚C
24/9/2021	NM1	8:30	-	9:00	Sunny	55.1	57.3	46.0	0.4 m/s	30.0 ˚C
29/09/2021	NM1	08:30	-	09:00	Sunny	54.7	56.5	48.3	0.5 m/s	27.0 ˚C



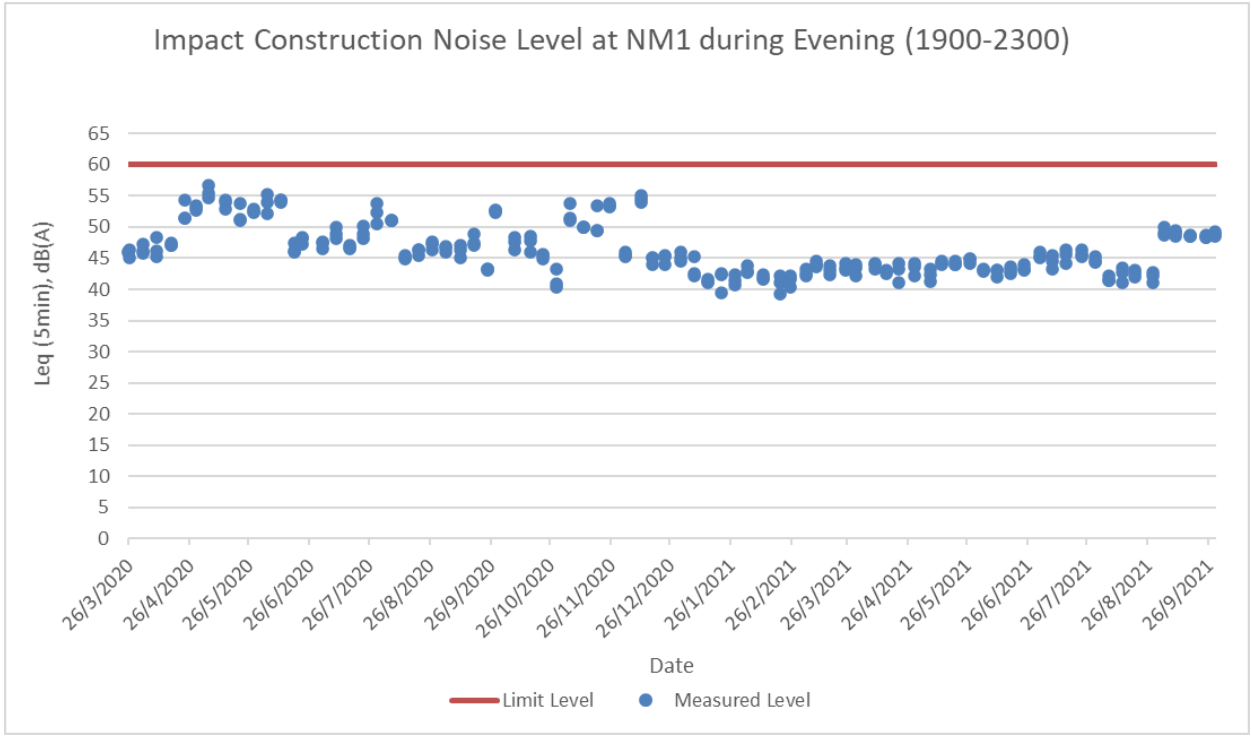
Daytime (0700-1900) during general holidays and Sundays

Date	Location	Time			Weather	$L_{eq\ (5min)}$	L_{10}	L_{90}	Wind Speed	Temperature
5/9/2021	NM1	9:10	-	9:15	Cloudy	50.7	51.6	44.9	1.4 m/s	28.2 °C
5/9/2021	NM1	9:15	-	9:20	Cloudy	49.6	50.8	44.1		
5/9/2021	NM1	9:20	-	9:25	Cloudy	49.0	50.3	43.1		
12/9/2021	NM1	16:00	-	16:05	Sunny	50.1	54.3	48.2	0.7 m/s	28.4 °C
12/9/2021	NM1	16:05	-	16:10	Sunny	47.1	50.3	45.3		
12/9/2021	NM1	16:10	-	16:15	Sunny	52.5	54.1	50.3		
19/9/2021	NM1	8:25	-	8:30	Sunny	53.1	55.2	49.2	0.5 m/s	29.6 °C
19/9/2021	NM1	8:30	-	8:35	Sunny	52.6	54.5	48.5		
19/9/2021	NM1	8:35	-	8:40	Sunny	53.1	56.4	50.3		
22/9/2021	NM1	15:30	-	15:35	Sunny	51.4	53.4	46.8	0.6 m/s	29.8 °C
22/9/2021	NM1	15:35	-	15:40	Sunny	51.7	54.2	48.5		
22/9/2021	NM1	15:40	-	15:45	Sunny	53.6	56.3	49.8		



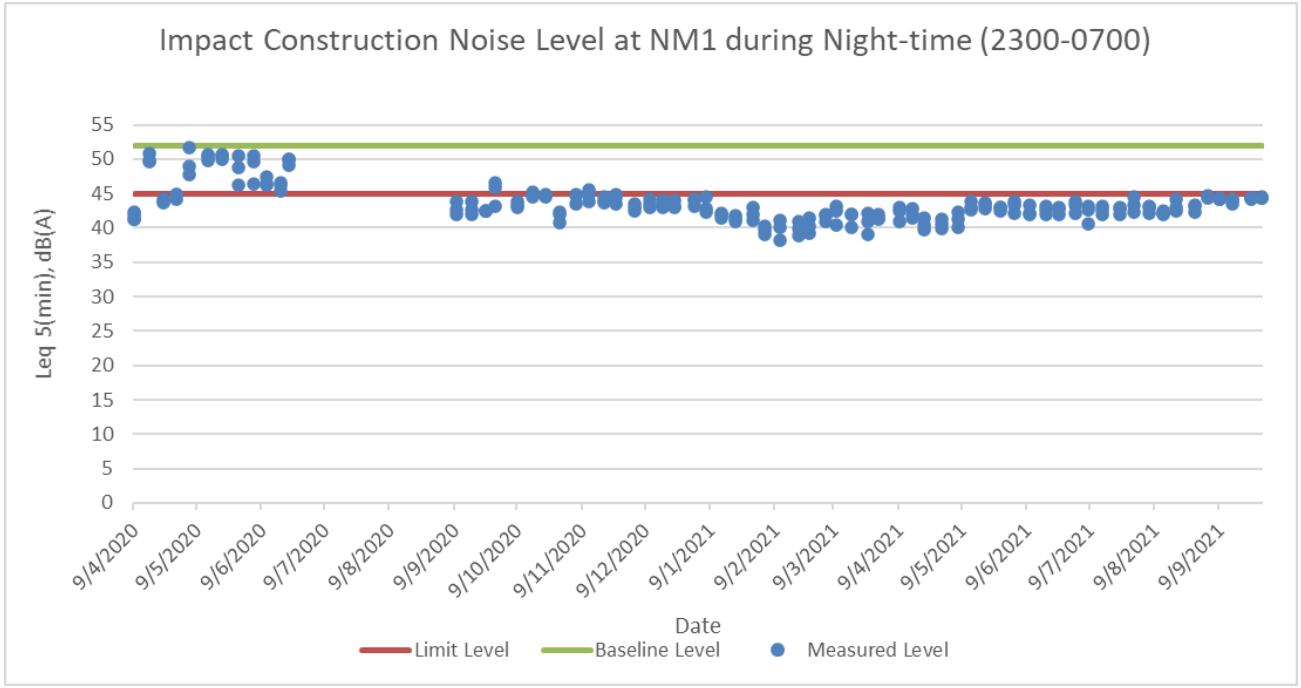
All days during Evening (1900-2300)

Date	Location	Time			Weather	$L_{eq\ (5min)}$	L_{10}	L_{90}	Wind Speed	Temperature
3/9/2021	NM1	22420	-	22:45	Fine	49.9	49.9	49.4	0.4 m/s	26.6 ˚C
3/9/2021	NM1	22:45	-	22:50	Fine	49.0	49.3	48.7		
3/9/2021	NM1	22:50	-	22:55	Fine	48.7	48.9	48.5		
9/9/2021	NM1	22:20	-	22:25	Fine	49.4	49.6	48.6	1.2 m/s	26.6 ˚C
9/9/2021	NM1	22:25	-	22:30	Fine	49.1	49.4	48.3		
9/9/2021	NM1	22:30	-	22:35	Fine	48.6	49.4	48.4		
16/9/2021	NM1	22:30	-	22:35	Fine	48.7	49.4	48.1	2.2 m/s	25.7 ˚C
16/9/2021	NM1	22:35	-	22:40	Fine	48.5	49.3	48.3		
16/9/2021	NM1	22:40	-	22:45	Fine	48.6	49.5	48.4		
24/9/2021	NM1	22:30	-	22:35	Fine	48.4	49.3	48.3	2.7 m/s	26.2 ˚C
24/9/2021	NM1	22:35	-	22:40	Fine	48.4	49.4	48.0		
24/9/2021	NM1	22:40	-	22:45	Fine	48.7	49.2	48.3		
29/09/2021	NM1	22:25	-	22:30	Fine	48.9	49.4	48.6	1.6 m/s	26.4 ˚C
29/09/2021	NM1	22:30	-	22:35	Fine	49.2	49.3	48.5		
29/09/2021	NM1	22:35	-	22:40	Fine	48.6	49.2	48.2		



All days during Night-time (2300-0700)

Date	Location	Time			Weather	$L_{eq\ (5min)}$	L_{10}	L_{90}	Wind Speed	Temperature
3/9/2021	NM1	23:00	-	23:05	Fine	44.4	44.6	43.3	3.6 m/s	27.4 ˚C
3/9/2021	NM1	23:05	-	23:10	Fine	44.5	44.6	43.3		
3/9/2021	NM1	23:10	-	23:15	Fine	44.7	44.9	44.4		
9/9/2021	NM1	23:15	-	23:20	Fine	44.2	45.6	44.0	4.0 m/s	28.1 ˚C
9/9/2021	NM1	23:20	-	23:25	Fine	44.4	46.1	44.3		
9/9/2021	NM1	23:25	-	23:30	Fine	44.2	45.7	44.0		
15/9/2021	NM1	23:00	-	23:05	Fine	44.0	45.8	43.3	1.3 m/s	26.2 ˚C
15/9/2021	NM1	23:05	-	23:10	Fine	43.5	45.7	43.3		
15/9/2021	NM1	23:10	-	23:15	Fine	44.2	45.8	43.5		
24/9/2021	NM1	23:04	-	23:09	Fine	44.2	45.3	43.5	1.3 m/s	27.3 ˚C
24/9/2021	NM1	23:09	-	23:14	Fine	44.3	45.4	43.3		
24/9/2021	NM1	23:14	-	23:19	Fine	44.3	45.2	43.5		
29/09/2021	NM1	23:09	-	23:14	Fine	44.4	45.3	43.2	1.2 m/s	26.8 ˚C
29/09/2021	NM1	23:14	-	23:19	Fine	44.3	45.2	43.2		
29/09/2021	NM1	23:19	-	23:24	Fine	44.5	45.3	43.4		

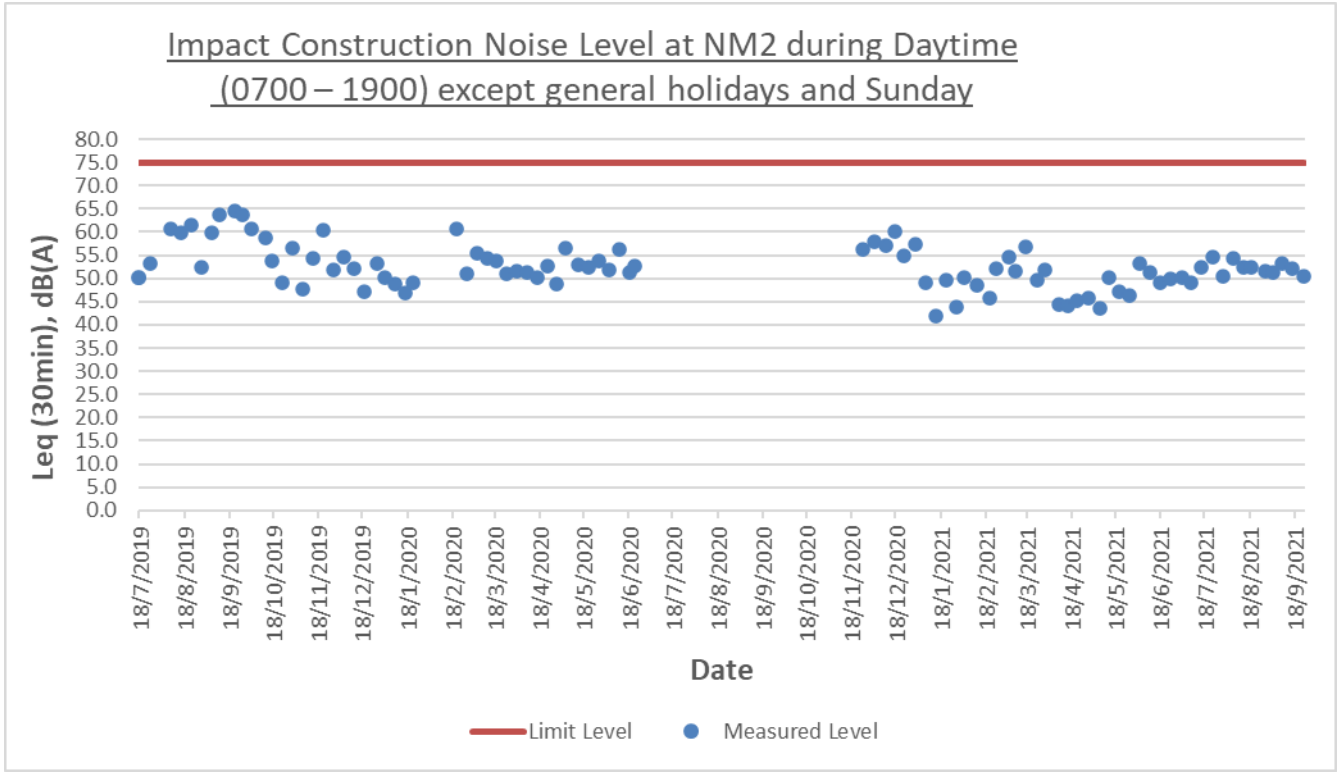


Impact Noise Monitoring Data

NM2 – 4 ½ Milestone, Tai Po Road

Daytime (0700 – 1900) except general holidays and Sunday

Date	Location	Time			Weather	$L_{eq\ (30min)}$	L_{10}	L_{90}	Wind Speed	Temperature
3/9/2021	NM2	13:13	-	13:43	Sunny	51.2	53.4	46.1	0.8 m/s	30.0 ˚C
9/9/2021	NM2	15:30	-	16:00	Sunny	53.2	55.2	49.3	0.0 m/s	30.3 ˚C
16/9/2021	NM2	9:50	-	10:20	Sunny	52.1	54.3	47.3	1.5 m/s	30.4 ˚C
24/9/2021	NM2	9:45	-	10:15	Sunny	50.5	53.5	47.5	0.6 m/s	30.0 ˚C
29/09/2021	NM2	09:20	-	09:50	Sunny	51.8	53.2	48.0	1.0 m/s	27.0 ˚C



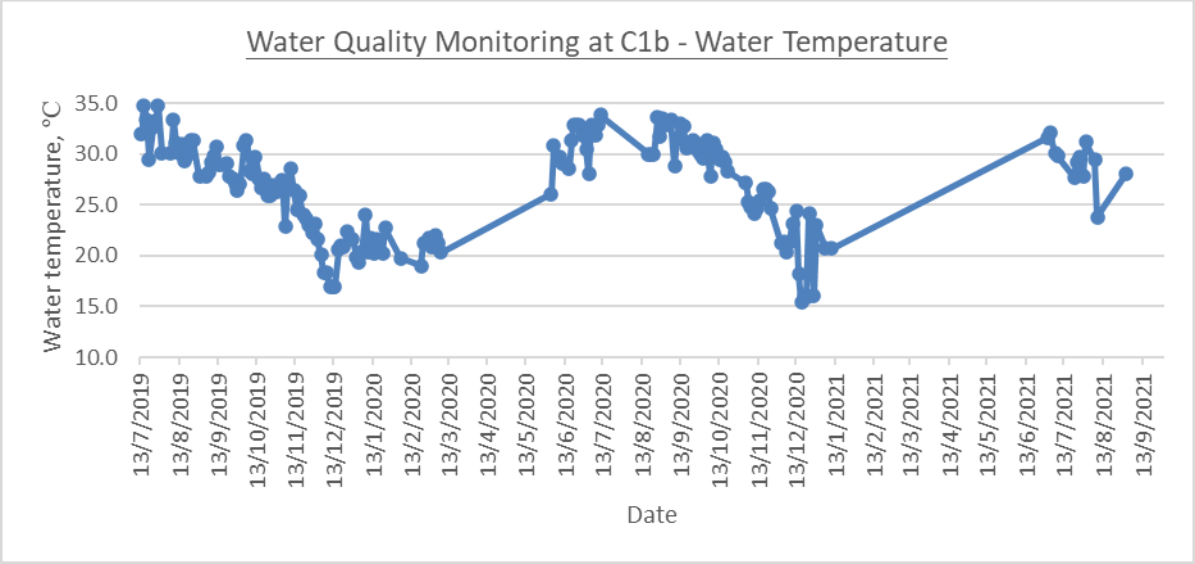
Note 1: Period without data implied that no works were conducted at the monitoring location and no noise monitoring was needed for the location.

Appendix F
Impact Water Quality Monitoring Data

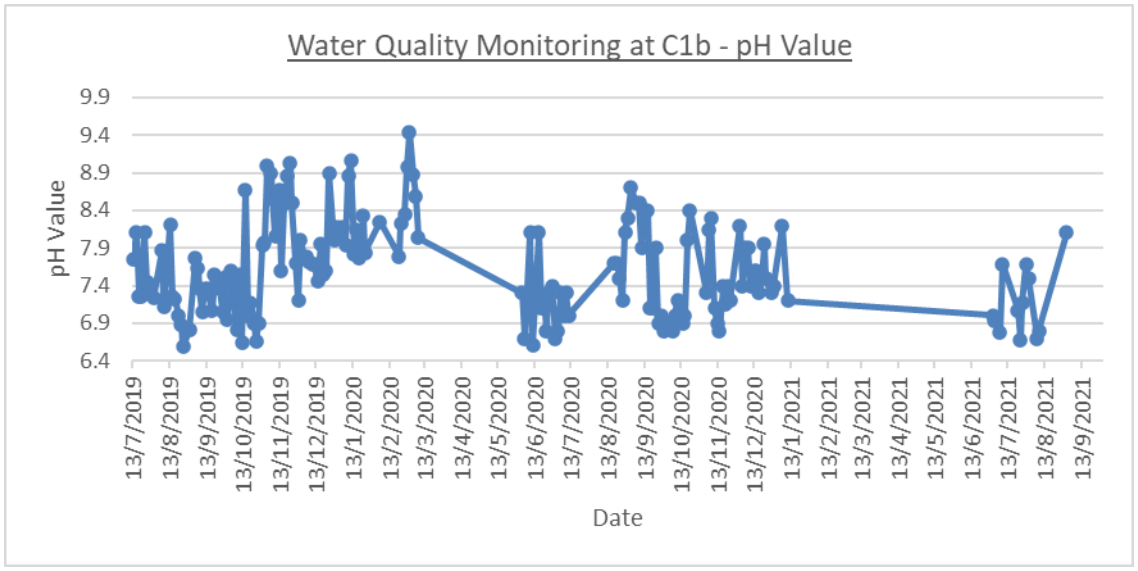
Location	Date	Sample ID	Time	Temp (°C)	pH	DO (mg/L)	DO%	Turbidity (NTU)	SS (mg/L)
C1b	3/9/2021	C1b	/	/	/	/	/	/	/
	3/9/2021	C1b#	/	/	/	/	/	/	/
	5/9/2021	C1b	/	/	/	/	/	/	/
	5/9/2021	C1b#	/	/	/	/	/	/	/
	7/9/2021	C1b	/	/	/	/	/	/	/
	7/9/2021	C1b#	/	/	/	/	/	/	/
	9/9/2021	C1b	/	/	/	/	/	/	/
	9/9/2021	C1b#	/	/	/	/	/	/	/
	11/9/2021	C1b	/	/	/	/	/	/	/
	11/9/2021	C1b#	/	/	/	/	/	/	/
	14/9/2021	C1b	/	/	/	/	/	/	/
	14/9/2021	C1b#	/	/	/	/	/	/	/
	16/9/2021	C1b	/	/	/	/	/	/	/
	16/9/2021	C1b#	/	/	/	/	/	/	/
	18/9/2021	C1b	/	/	/	/	/	/	/
	18/9/2021	C1b#	/	/	/	/	/	/	/
	20/9/2021	C1b	/	/	/	/	/	/	/
	20/9/2021	C1b#	/	/	/	/	/	/	/
	22/9/2021	C1b	/	/	/	/	/	/	/
	22/9/2021	C1b#	/	/	/	/	/	/	/
	25/9/2021	C1b	/	/	/	/	/	/	/
	25/9/2021	C1b#	/	/	/	/	/	/	/
	27/9/2021	C1b	/	/	/	/	/	/	/
	27/9/2021	C1b#	/	/	/	/	/	/	/
	29/9/2021	C1b	/	/	/	/	/	/	/
	29/9/2021	C1b#	/	/	/	/	/	/	/

Location	Date	Sample ID	Time	Temp (ºC)	pH	DO (mg/L)	DO%	Turbidity (NTU)	SS (mg/L)
D1b	3/9/2021	D1b	12:30	29.7	7.0	7.8	103.1	2.3	2.7
	3/9/2021	D1b#	12:31	29.8	7.0	7.7	102.0	1.9	2.7
	5/9/2021	D1b	10:35	29.0	8.2	8.8	114.6	2.3	2.6
	5/9/2021	D1b#	10:37	29.7	8.3	8.7	114.4	2.8	2.5
	7/9/2021	D1b	9:32	30.7	7.3	6.8	91.5	0.4	2.7
	7/9/2021	D1b#	9:33	30.5	7.1	6.9	91.9	0.9	2.7
	9/9/2021	D1b	9:26	29.0	7.3	7.4	96.0	1.7	3.1
	9/9/2021	D1b#	9:26	29.0	7.2	7.5	97.8	1.7	2.7
	11/9/2021	D1b	16:10	31.5	7.3	7.3	98.6	1.0	2.5
	11/9/2021	D1b#	16:11	31.3	7.3	7.8	105.9	1.3	2.5
	14/9/2021	D1b	16:12	29.8	7.4	7.4	97.6	4.3	2.8
	14/9/2021	D1b#	16:13	29.8	7.3	7.5	98.8	2.8	2.5
	16/9/2021	D1b	9:09	29.6	7.2	7.5	98.1	1.8	2.5
	16/9/2021	D1b#	9:11	29.6	7.2	7.6	99.2	2.1	2.5
	18/9/2021	D1b	14:37	28.3	7.6	7.4	95.4	0.7	2.5
	18/9/2021	D1b#	14:38	28.4	7.6	7.8	100.5	0.7	2.5
	20/9/2021	D1b	9:32	29.1	7.7	7.3	95.5	1.9	2.5
	20/9/2021	D1b#	9:33	29.2	7.6	7.3	95.6	1.9	2.5
	22/9/2021	D1b	16:51	30.7	7.0	6.5	86.8	2.1	3.2
	22/9/2021	D1b#	16:58	30.7	7.1	6.6	87.9	1.1	2.5
	25/9/2021	D1b	10:52	29.2	7.3	7.0	90.8	1.4	4.5
	25/9/2021	D1b#	10:53	29.2	7.2	6.9	90.5	1.5	4.3
	27/9/2021	D1b	15:58	31.0	7.3	7.0	94.7	1.7	3.0
	27/9/2021	D1b#	15:57	31.0	7.3	7.0	94.7	1.7	2.5
	29/9/2021	D1b	9:31	29.7	7.2	7.0	91.7	0.9	2.5
	29/9/2021	D1b#	9:32	29.7	7.2	7.0	91.7	1.0	2.5

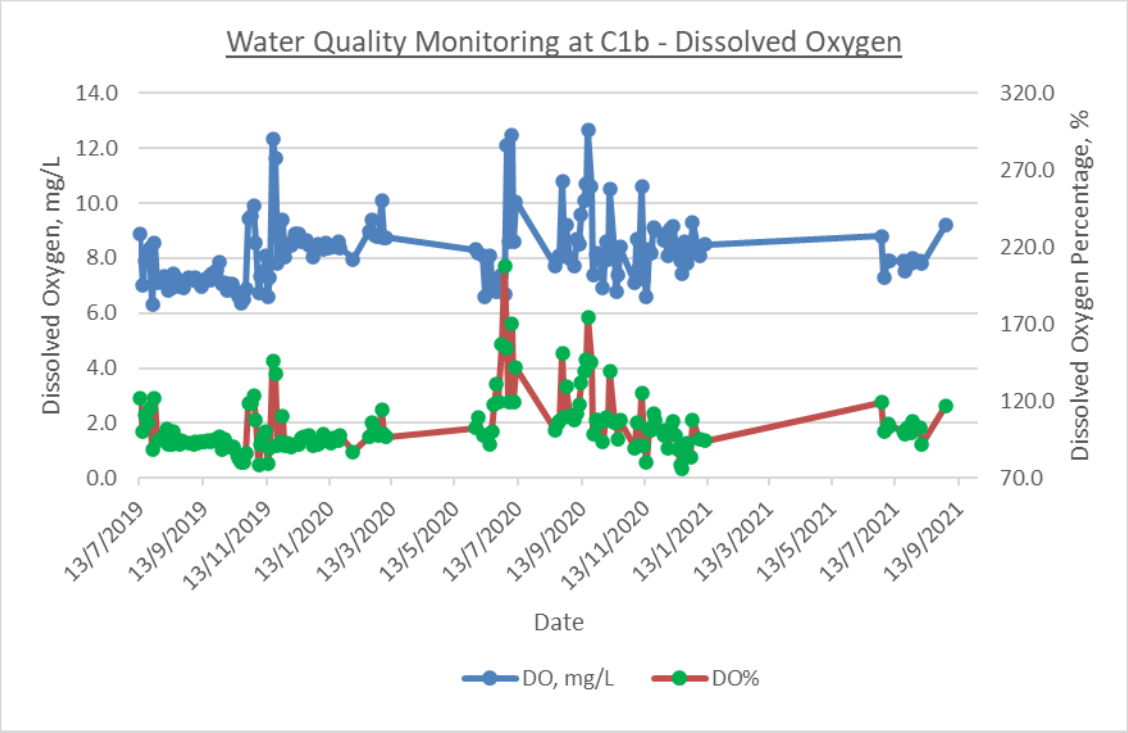
C1b



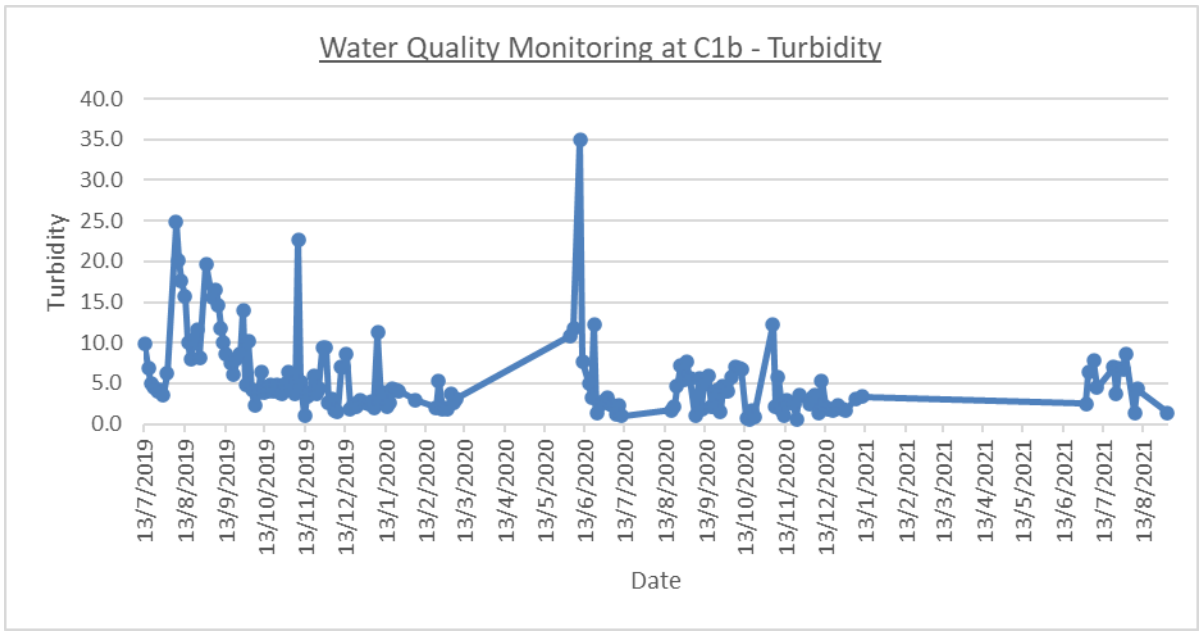
Note 1: Period without data implied that water in location C1b was dried up, insufficient water was available for sample collection



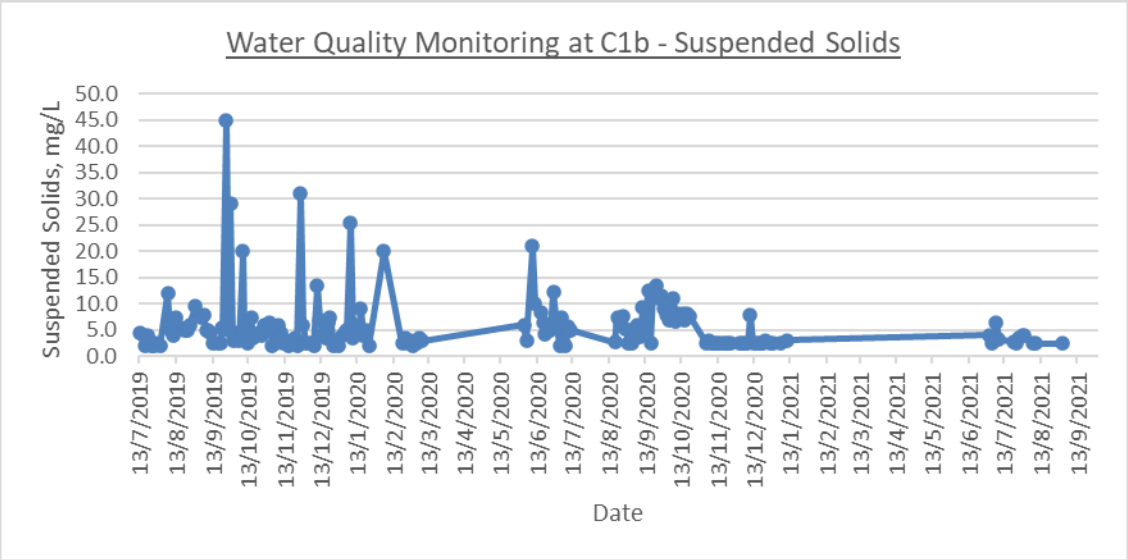
Note 1: Period without data implied that water in location C1b was dried up, insufficient water was available for sample collection



Note 1: Period without data implied that water in location C1b was dried up, insufficient water was available for sample collection

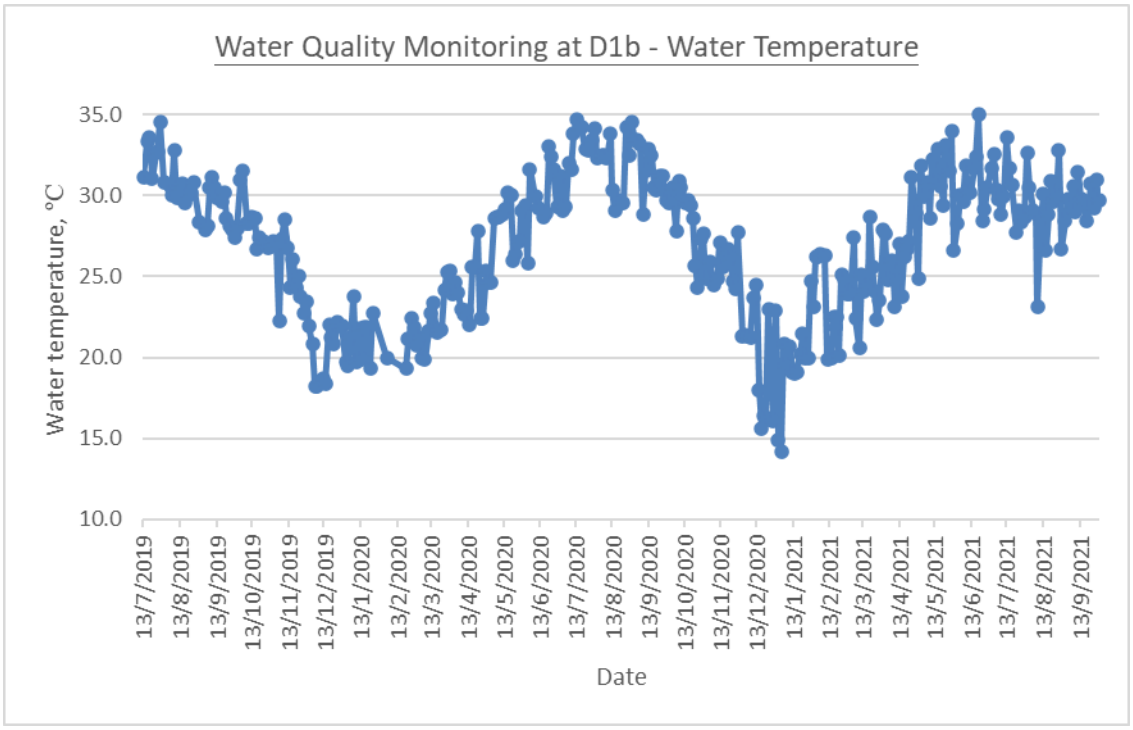


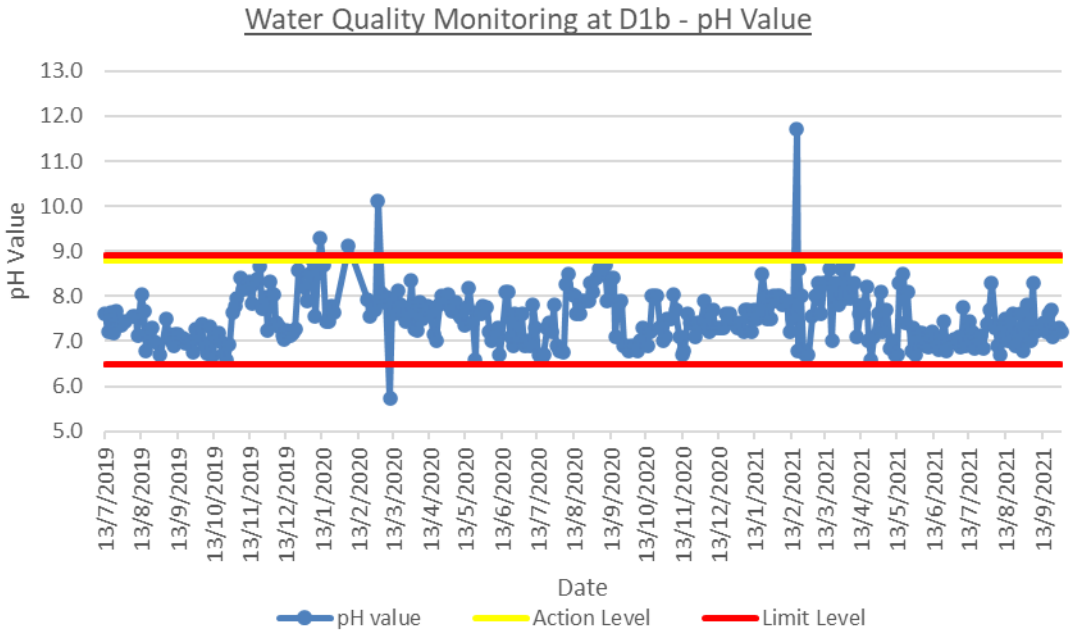
Note 1: Period without data implied that water in location C1b was dried up, insufficient water was available for sample collection

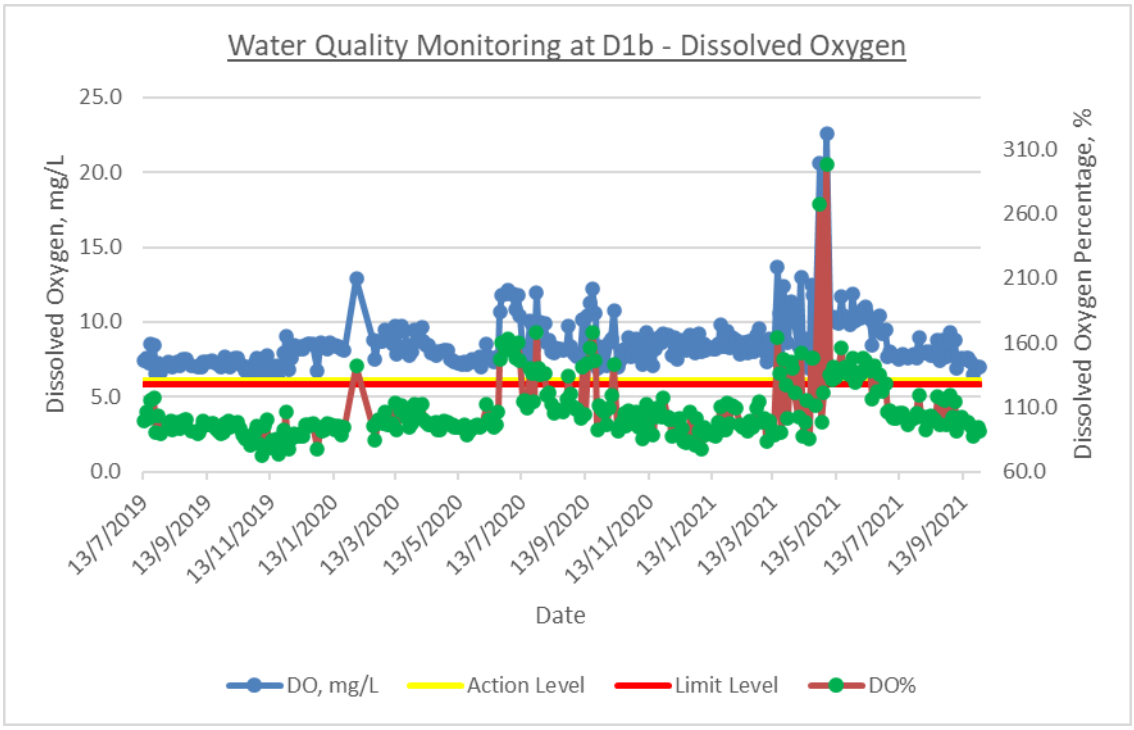


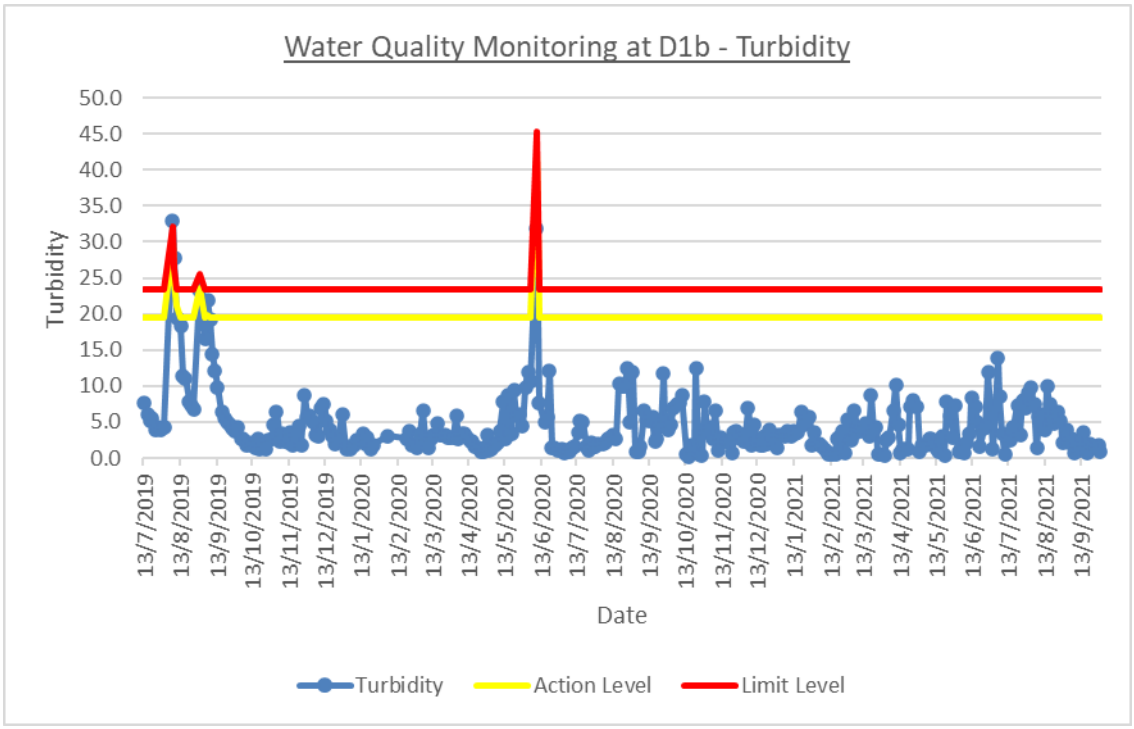
Note 1: Period without data implied that water in location C1b was dried up, insufficient water was available for sample collection

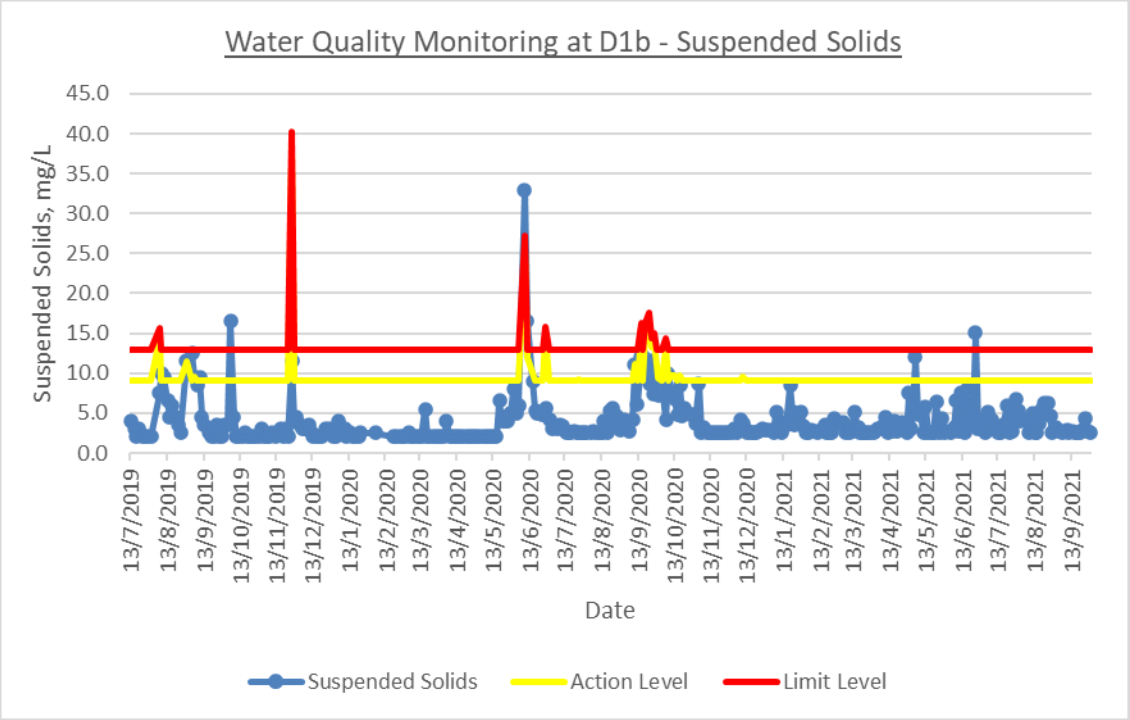
D1b


Water Quality Monitoring at D1b - Water Temperature
Water temperature, °C
35.0
30.0
25.0
20.0
15.0
10.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date


Water Quality Monitoring at D1b - pH Value
pH Value
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date
pH value
Action Level
Limit Level


Water Quality Monitoring at D1b - Dissolved Oxygen
Dissolved Oxygen, mg/L
Dissolved Oxygen Percentage, %
25.0
20.0
15.0
10.0
5.0
0.0
310.0
260.0
210.0
160.0
110.0
60.0
13/7/2019
13/9/2019
13/11/2019
13/1/2020
13/3/2020
13/5/2020
13/7/2020
13/9/2020
13/11/2020
13/1/2021
13/3/2021
13/5/2021
13/7/2021
13/9/2021
Date
DO, mg/L
Action Level
Limit Level
DO%


Water Quality Monitoring at D1b - Turbidity
Turbidity
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date
Turbidity
Action Level
Limit Level

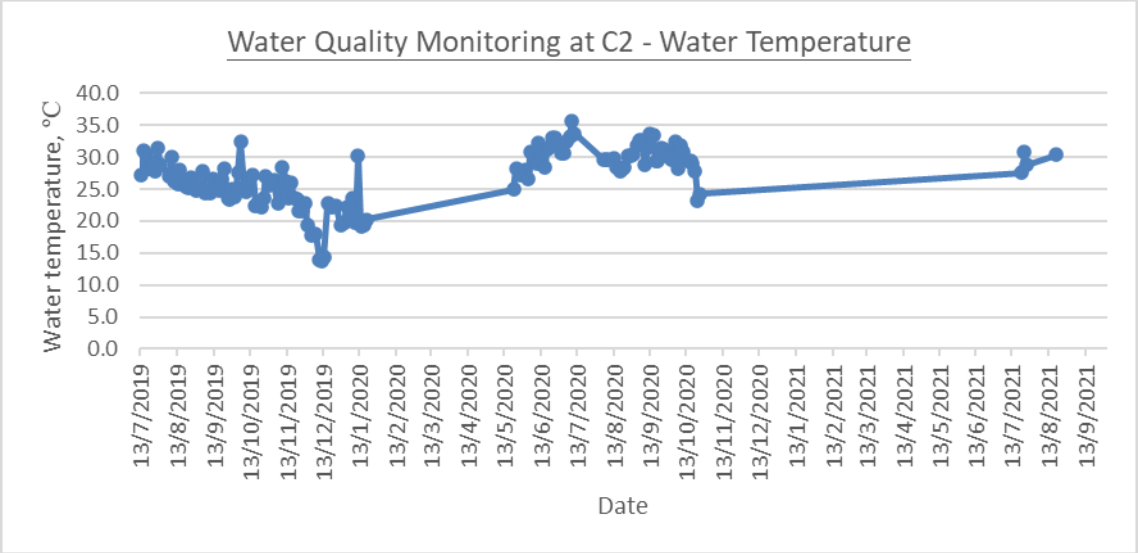

Water Quality Monitoring at D1b - Suspended Solids
Suspended Solids, mg/L
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date
Suspended Solids
Action Level
Limit Level

Location	Date	Sample ID	Time	Temp (ºC)	pH	DO (mg/L)	DO%	Turbidity (NTU)	SS (mg/L)
C2	3/9/2021	C2	/	/	/	/	/	/	/
	3/9/2021	C2#	/	/	/	/	/	/	/
	5/9/2021	C2	/	/	/	/	/	/	/
	5/9/2021	C2#	/	/	/	/	/	/	/
	7/9/2021	C2	/	/	/	/	/	/	/
	7/9/2021	C2#	/	/	/	/	/	/	/
	9/9/2021	C2	/	/	/	/	/	/	/
	9/9/2021	C2#	/	/	/	/	/	/	/
	11/9/2021	C2	/	/	/	/	/	/	/
	11/9/2021	C2#	/	/	/	/	/	/	/
	14/9/2021	C2	/	/	/	/	/	/	/
	14/9/2021	C2#	/	/	/	/	/	/	/
	16/9/2021	C2	/	/	/	/	/	/	/
	16/9/2021	C2#	/	/	/	/	/	/	/
	18/9/2021	C2	/	/	/	/	/	/	/
	18/9/2021	C2#	/	/	/	/	/	/	/
	20/9/2021	C2	/	/	/	/	/	/	/
	20/9/2021	C2#	/	/	/	/	/	/	/
	22/9/2021	C2	/	/	/	/	/	/	/
	22/9/2021	C2#	/	/	/	/	/	/	/
	25/9/2021	C2	/	/	/	/	/	/	/
	25/9/2021	C2#	/	/	/	/	/	/	/
	27/9/2021	C2	/	/	/	/	/	/	/
	27/9/2021	C2#	/	/	/	/	/	/	/
	29/9/2021	C2	/	/	/	/	/	/	/
	29/9/2021	C2#	/	/	/	/	/	/	/

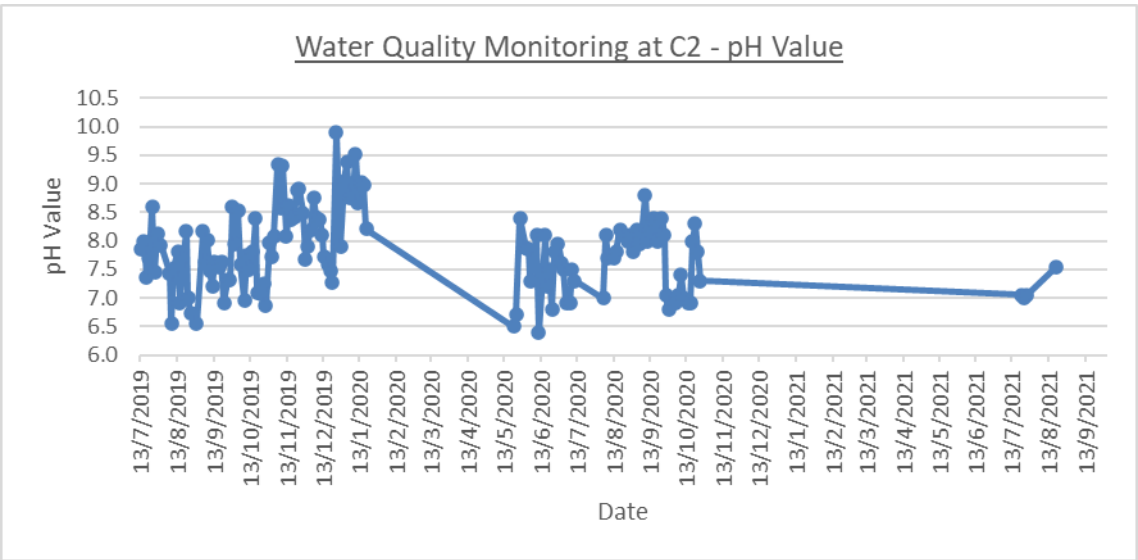
Location	Date	Sample ID	Time	Temp (°C)	pH	DO (mg/L)	DO%	Turbidity (NTU)	SS (mg/L)
D2a	3/9/2021	D2a	11:16	28.0	7.9	6.7	85.1	5.1	2.5
	3/9/2021	D2a#	11:18	28.2	7.8	7.0	89.6	5.1	2.5
	5/9/2021	D2a	10:04	26.0	8.2	9.1	112.2	3.6	2.5
	5/9/2021	D2a#	10:07	26.2	7.9	9.0	111.8	3.6	2.5
	7/9/2021	D2a	8:09	28.8	7.8	8.0	103.2	2.7	2.5
	7/9/2021	D2a#	8:10	28.7	7.7	7.9	101.5	2.4	2.5
	9/9/2021	D2a	8:14	28.8	7.3	8.0	103.3	2.3	2.5
	9/9/2021	D2a#	8:16	28.9	7.3	7.9	103.2	2.8	2.5
	11/9/2021	D2a	15:06	32.5	7.1	7.8	107.4	3.0	2.5
	11/9/2021	D2a#	15:07	32.6	7.2	7.7	106.6	3.8	2.5
	14/9/2021	D2a	15:08	29.7	8.0	7.2	94.1	2.9	2.8
	14/9/2021	D2a#	15:09	29.7	7.9	7.2	94.7	2.8	2.5
	16/9/2021	D2a	8:04	31.4	6.9	7.5	102.0	1.6	2.5
	16/9/2021	D2a#	8:08	31.5	7.0	7.8	106.0	2.0	2.5
	18/9/2021	D2a	13:31	29.4	7.4	7.7	101.2	1.1	2.5
	18/9/2021	D2a#	13:32	29.4	7.4	7.4	96.1	1.1	2.5
	20/9/2021	D2a	8:17	25.9	6.9	7.5	92.4	1.4	2.5
	20/9/2021	D2a#	8:18	25.9	7.1	7.5	92.4	0.9	2.5
	22/9/2021	D2a	15:30	32.6	7.2	6.8	94.1	1.0	3.0
	22/9/2021	D2a#	15:32	32.7	7.3	6.8	93.9	0.8	3.0
	25/9/2021	D2a	9:49	28.7	7.1	7.1	91.4	2.1	2.5
	25/9/2021	D2a#	9:50	28.7	7.0	7.1	91.5	2.0	2.5
	27/9/2021	D2a	14:01	31.1	7.4	7.3	98.1	1.6	2.8
	27/9/2021	D2a#	14:02	31.1	7.3	7.3	98.0	2.0	2.5
	29/9/2021	D2a	8:08	29.0	7.1	7.1	92.6	1.6	2.5
	29/9/2021	D2a#	8:09	28.9	7.1	7.1	92.4	1.6	2.5

	Date	Approximate Sampling Location Coordinates
D2a	3/9/2021	835049.378 E 825660.006 N
	5/9/2021	
	7/9/2021	835047.652 E 825662.013 N
	9/9/2021	
	11/9/2021	
	14/9/2021	
	16/9/2021	835047.405 E 825662.117 N
	18/9/2021	
	20/9/2021	
	22/9/2021	
	25/9/2021	
	27/9/2021	
	29/9/2021	835046.648 E 825661.137 N

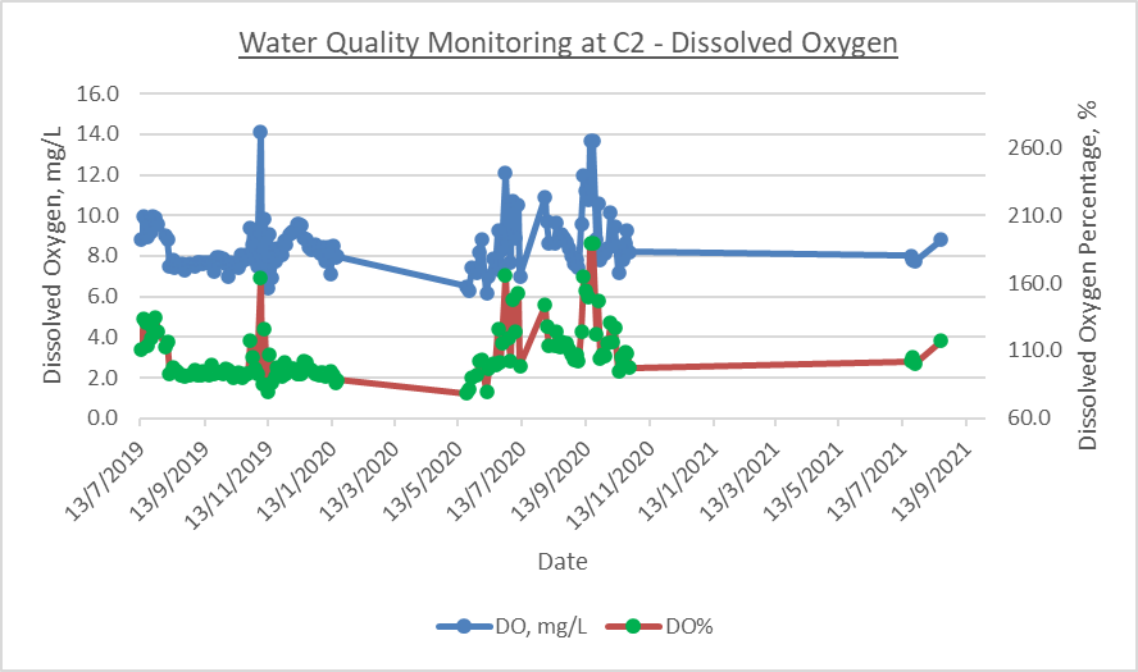
C2



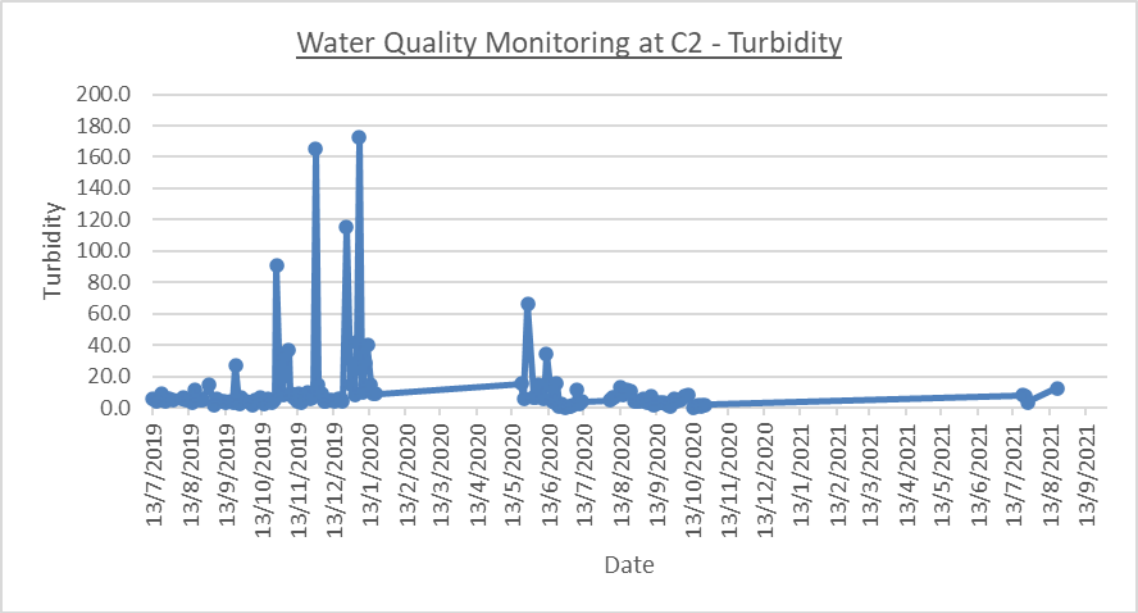
Note 1: Period without data implied that water in location C2 was dried up, insufficient water was available for sample collection



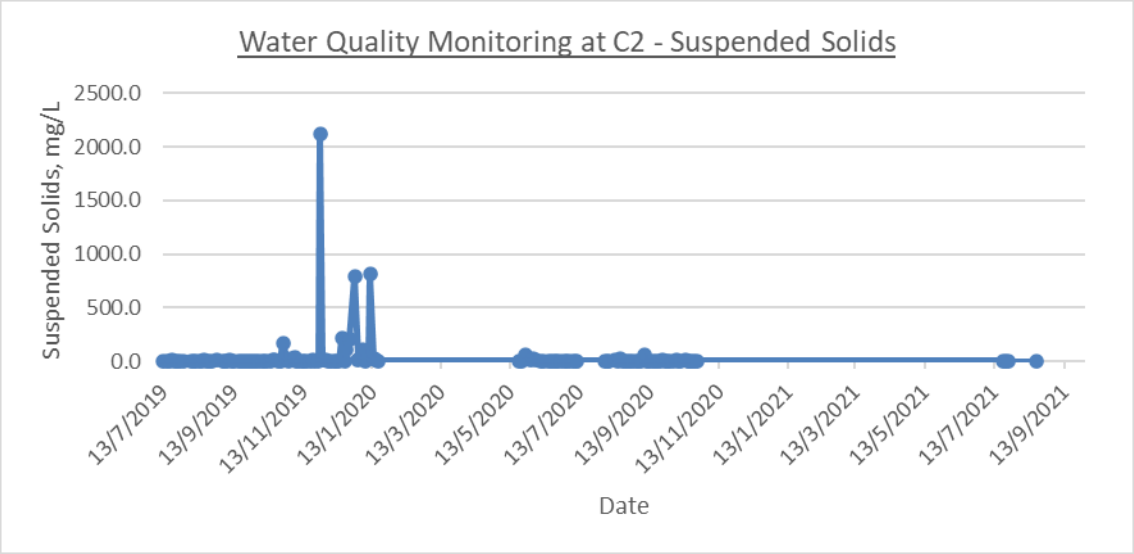
Note 1: Period without data implied that water in location C2 was dried up, insufficient water was available for sample collection



Note 1: Period without data implied that water in location C2 was dried up, insufficient water was available for sample collection

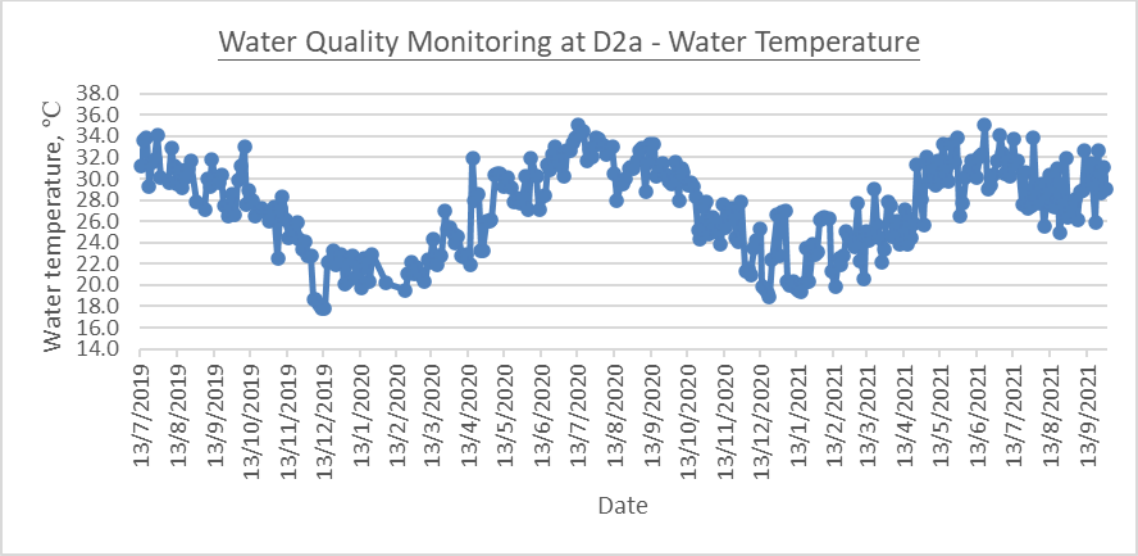


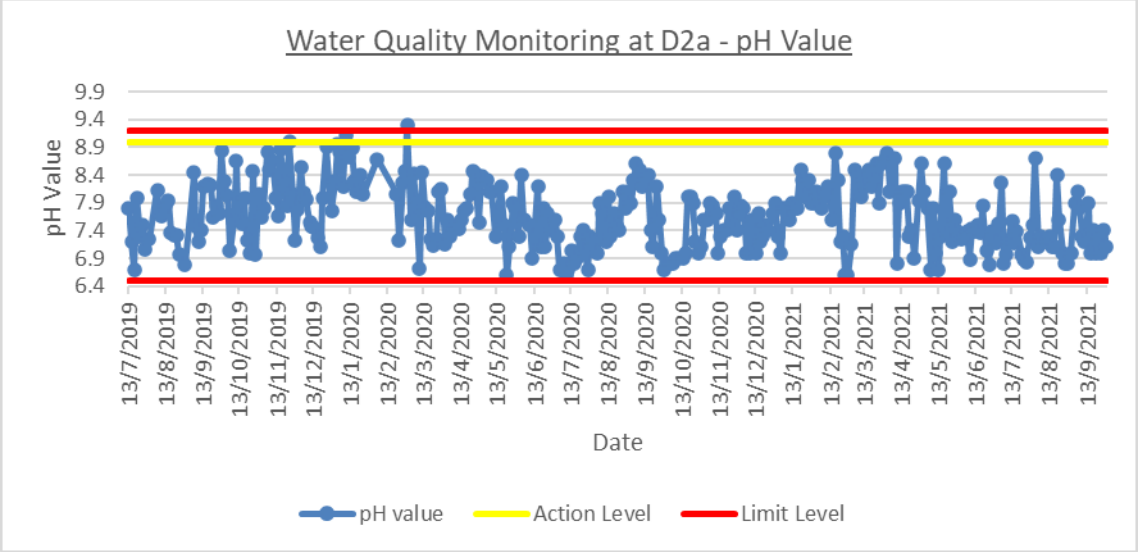
Note 1: Period without data implied that water in location C2 was dried up, insufficient water was available for sample collection

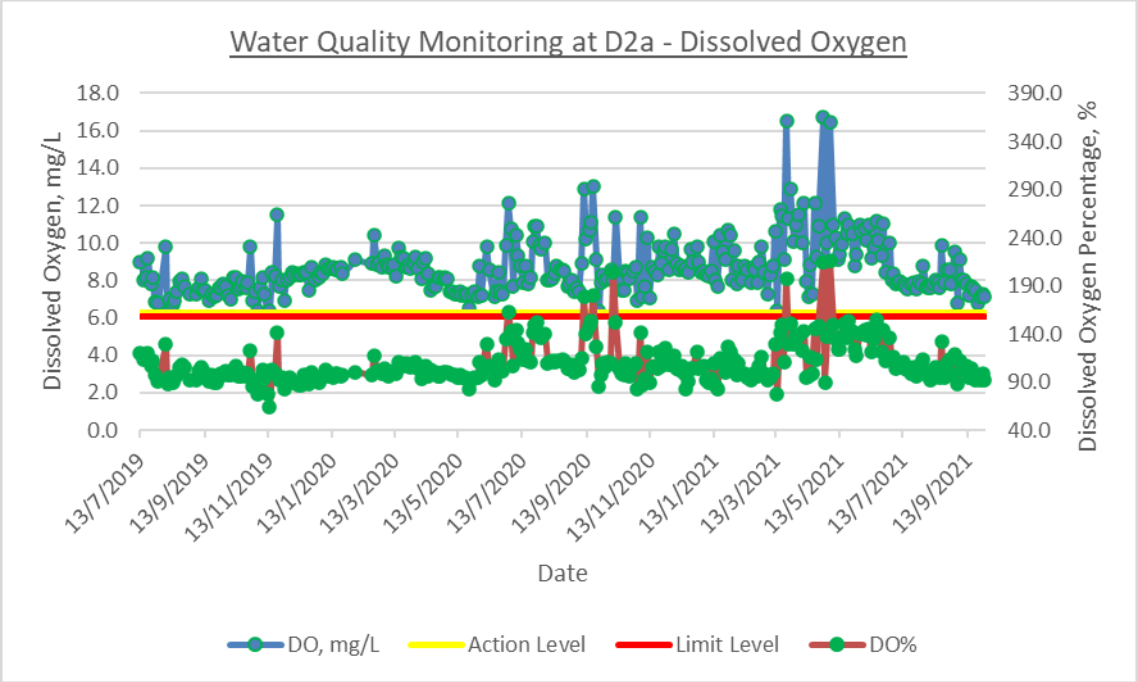


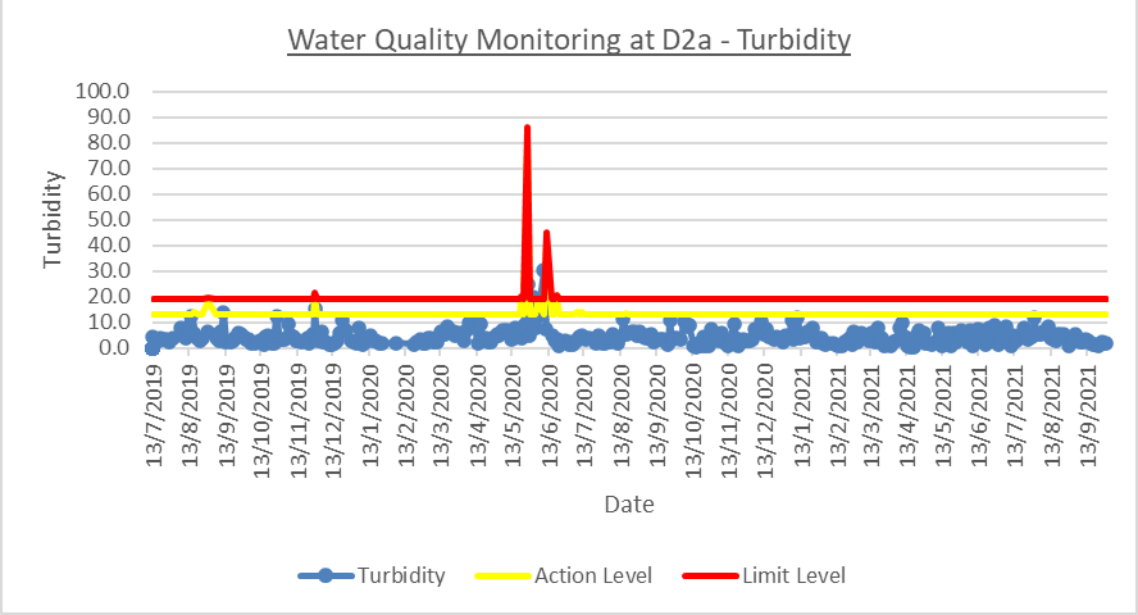
Note 1: Period without data implied that water in location C2 was dried up, insufficient water was available for sample collection

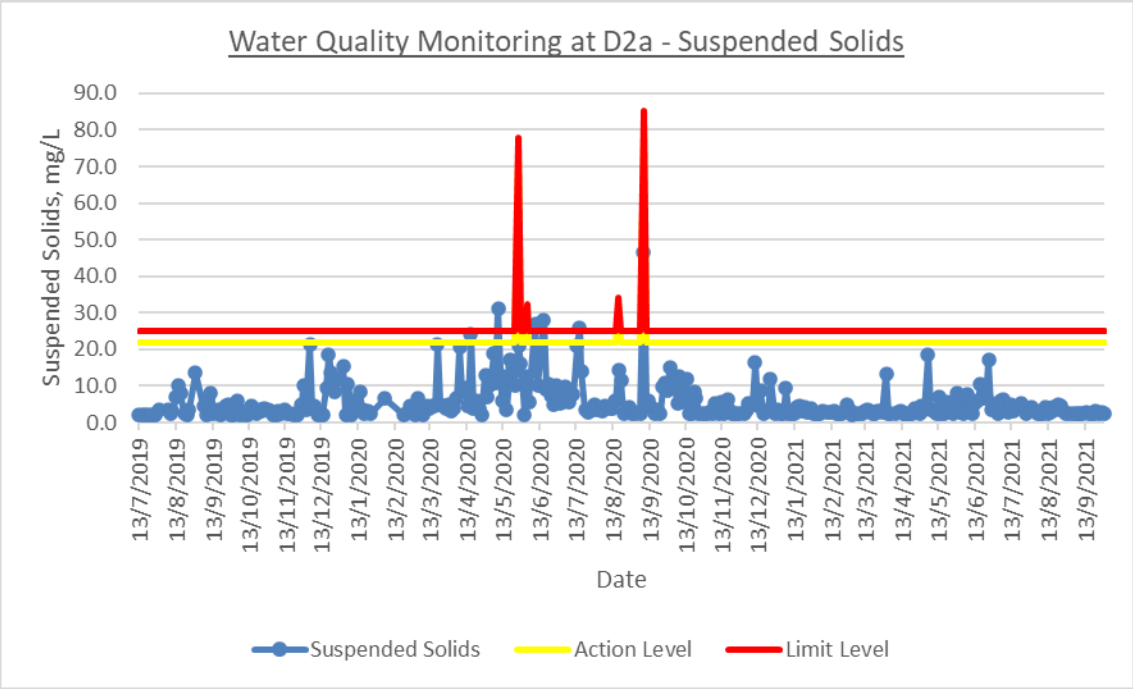
D2a


Water Quality Monitoring at D2a - Water Temperature
Water temperature, °C
38.0
36.0
34.0
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date


Water Quality Monitoring at D2a - pH Value
pH Value
9.9
9.4
8.9
8.4
7.9
7.4
6.9
6.4
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date
pH value
Action Level
Limit Level


Water Quality Monitoring at D2a - Dissolved Oxygen
Dissolved Oxygen, mg/L
Dissolved Oxygen Percentage, %
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
390.0
340.0
290.0
240.0
190.0
140.0
90.0
40.0
13/7/2019
13/9/2019
13/11/2019
13/1/2020
13/3/2020
13/5/2020
13/7/2020
13/9/2020
13/11/2020
13/1/2021
13/3/2021
13/5/2021
13/7/2021
13/9/2021
Date
DO, mg/L
Action Level
Limit Level
DO%


Water Quality Monitoring at D2a - Turbidity
Turbidity
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date
Turbidity
Action Level
Limit Level


Water Quality Monitoring at D2a - Suspended Solids
Suspended Solids, mg/L
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
13/7/2019
13/8/2019
13/9/2019
13/10/2019
13/11/2019
13/12/2019
13/1/2020
13/2/2020
13/3/2020
13/4/2020
13/5/2020
13/6/2020
13/7/2020
13/8/2020
13/9/2020
13/10/2020
13/11/2020
13/12/2020
13/1/2021
13/2/2021
13/3/2021
13/4/2021
13/5/2021
13/6/2021
13/7/2021
13/8/2021
13/9/2021
Date
Suspended Solids
Action Level
Limit Level

Appendix G
Supplementary Meteorological Data

EXTRACT OF METEOROLOGICAL OBSERVATIONS FOR HONG KONG, SEPTEMBER 2021 (Table 1)

Date September	Mean Pressure (hPa)	Air Temperature			Mean Dew Point Temperature (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Maximum (deg. C)	Mean (deg. C)	Minimum (deg. C)				
1	1009.9	32.1	28.7	26.7	25.8	85	84	5.9
2	1009.0	33.0	29.5	27.7	25.7	80	74	-
3	1007.4	33.6	29.8	27.8	25.6	79	66	Trace
4	1008.3	33.6	29.8	27.9	25.7	79	49	0.9
5	1010.0	33.2	29.8	28.3	25.7	79	61	Trace
6	1010.5	32.5	29.7	28.0	25.2	77	73	-
7	1010.4	33.4	30.1	28.1	25.7	78	72	0.2
8	1009.4	34.3	30.6	28.2	25.2	74	66	-
9	1009.3	33.5	30.1	27.8	24.7	73	66	-
10	1008.3	33.7	30.5	28.6	24.6	71	79	-
11	1004.5	33.4	30.5	28.4	25.5	75	77	-
12	1002.0	34.5	31.2	29.0	26.4	76	78	-
13	1006.7	33.6	30.9	29.5	26.5	77	80	-
14	1011.5	30.2	29.0	26.7	25.8	83	81	33.8
15	1011.2	33.0	30.2	27.9	25.2	75	71	-
16	1009.4	31.9	29.2	26.8	24.6	77	86	Trace
17	1009.2	34.1	29.5	27.5	25.0	77	81	7.6
18	1011.1	33.2	30.2	28.3	26.1	79	69	0.2
19	1011.3	32.1	29.3	27.4	26.6	86	83	21.2
20	1010.4	32.3	29.3	27.9	26.2	84	80	9.4
21	1009.5	31.7	29.0	26.7	25.6	82	74	10.2
22	1010.5	34.0	30.3	27.9	25.7	77	66	0.5
23	1013.0	30.2	28.0	26.0	25.6	87	87	38.4
24	1013.6	32.0	29.4	27.8	25.7	81	76	1.2
25	1012.8	32.3	29.6	27.9	24.7	76	64	0.1
26	1012.3	31.6	29.1	27.8	23.5	72	86	-
27	1010.8	32.8	29.5	28.1	24.6	75	60	-
28	1009.6	32.2	29.6	27.9	24.7	75	66	-
29	1008.3	32.7	29.7	27.9	25.1	77	44	-
30	1008.1	32.9	30.3	28.4	26.0	78	38	-
Mean/Total	1009.6	32.8	29.7	27.8	25.4	78	71	129.6
Climatological Normal(1991-2020)	1008.8	30.5	27.9	26.1	23.6	78	66	321.4

Climatological Normal(1981-2010)	1008.9	30.1	27.7	25.8	23.4	78	66	327.6
Station	Hong Kong Observatory							

EXTRACT OF METEOROLOGICAL OBSERVATIONS FOR HONG KONG, SEPTEMBER 2021 (Table 2)

Date September	Number of hours of Reduced Visibility# (hours)	Total Bright Sunshine (hours)	Daily Global Solar Radiation (MJ/m^2)	Total Evaporation (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
1	0	6.2	21.31	5.0	080	21.2
2	0	10.1	26.19	5.8	080	13.5
3	0	6.2	17.17	3.7	120	7.1
4	0	5.1	13.72	3.5	140	7.8
5	0	8.2	21.15	4.7	120	8.0
6	0	6.8	14.06	3.9	080	11.9
7	0	9.3	21.54	5.2	060	24.3
8	0	11.0	26.83	6.1	120	10.3
9	0	8.0	17.85	4.9	080	10.4
10	0	10.5	24.53	5.7	080	21.0
11	0	8.5	21.22	5.1	250	16.0
12	0	9.6	21.20	5.5	250	27.7
13	0	6.5	17.23	4.9	240	19.0
14	0	1.5	6.94	2.0	200	6.8
15	0	10.0	22.95	5.2	250	18.2
16	0	3.2	11.93	3.4	280	14.1
17	2	7.8	18.57	4.3	070	7.5
18	0	9.1	22.52	5.4	070	24.5
19	0	5.8	17.73	3.8	110	22.3
20	0	7.3	17.46	3.6	090	7.9
21	0	5.6	9.28	3.0	150	8.5
22	0	10.3	24.08	6.0	090	14.6
23	0	1.2	7.12	5.4	090	30.7
24	0	6.8	17.07	4.4	090	31.8
25	0	8.5	20.54	5.5	080	35.2
26	0	5.3	13.53	3.7	080	26.0
27	0	7.0	16.80	3.8	080	16.3
28	0	6.0	14.06	3.8	090	10.3
29	0	8.8	18.94	4.3	240	13.0

30	0	8.3	18.26	4.1	240	14.9
Mean/Total	2	218.5	18.06	135.7	080	16.7
Climatological Normal(1991-2020)	70.8§	174.4	14.99	122.8	080	21.4
Climatological Normal(1981-2010)	70.8§	172.3	14.61	125.9	090	22.6
Station	Hong Kong International Airport	King's Park			Waglan Island^	

The minimum pressure recorded at the Hong Kong Observatory was 1000.1 hectopascals at 1541 HKT on 12 September.

The maximum air temperature recorded at the Hong Kong Observatory was 34.5 degrees C at 1442 HKT on 12 September.

The minimum air temperature recorded at the Hong Kong Observatory was 26.0 degrees C at 1933 HKT on 23 September.

The maximum gust peak speed recorded at Waglan Island was 91 kilometres per hour from 120 degrees at 0826 HKT on 23 September.

The maximum 1-minute mean rainfall rate recorded at the Hong Kong Observatory was 123 millimetres per hour at 0945 HKT on 14 September.

Reduced visibility refers to visibility below 8 kilometres when there is no fog, mist or precipitation.

- The visibility readings at the Hong Kong International Airport are based on hourly observations by professional meteorological observers in 2004 and before, and average readings over the 10-minute period before the clock hour of the visibility meter near the middle of the south runway from 2005 onwards. The change of the data source in 2005 is an improvement of the visibility assessment using instrumented observations following the international trend.

- Before 10 October 2007, the number of hours of reduced visibility at the Hong Kong International Airport in 2005 and thereafter displayed in this web page was based on hourly visibility observations by professional meteorological observers. Since 10 October 2007, the data have been revised using the average visibility readings over the 10-minute period before the clock hour, as recorded by the visibility meter near the middle of the south runway.

^ In case the data are not available from Waglan Island, observations of Cheung Chau or other nearby weather stations will be incorporated in computing the Prevailing Wind Direction and Mean Wind Speed.

§ 1997-2020 Mean value

Appendix H
Event / Action Plans

Table B-1 Event/ Action Plan for Noise Impact

Event and Action Plan for Noise Impact				
Event	**Action**			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level is reached	1. Notify IEC and Contractor 2. Carry out investigation 3. Report the results of the investigation to the IEC and Contractor 4. Discuss with the Contractor and formulate remedial measures	1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analyzed noise problem 4. Ensure remedial measures are properly implemented 5.	1. Submit noise mitigation proposal to IEC 2. Implement noise mitigation proposals
Limit Level is reached	1. Notify IEC, ER, EPD and Contractor 2. Identify source 3. Repeat measurement to confirm findings 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 5. Inform IEC, ER and EPD the causes & actions taken for the exceedances 6. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 7. If exceedance stops cease additional monitoring	1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analyzed noise problem 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion or work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table B-2 Event/ Action Plan for Water Quality Impact

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings and repeat measurement on next day of exceedance being recorded; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor;	1. Check monitoring data submitted by ET and Contractor's working methods. 2. Discuss with ET and Contractor on possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly;	1. Confirm receipt of notification of failure in writing 2. Discuss with IEC, ET and Contractor on the proposed mitigation. 3. Request Contractor to view the working methods. 4. Ensure mitigation measures are properly implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3 Check all plant and equipment and consider changes of working methods; 4. Discuss with ET, IEC and ER and propose mitigation measures to ER and IEC within 3 working days; 5. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings and repeat measurement on next day of exceedance being recorded; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency	1. Check monitoring data submitted by ET and Contractor's working methods. 2. Discuss with ET and Contractor on possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Take immediate action to avoid further exceedance 2. Discuss with ET, IEC and ER and propose mitigation measures to ER and IEC; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

	to daily until no exceedance of Limit level for two consecutive days.			

Appendix I
Monthly Waste Flow Table

Name of Department: ArchSD/CEDD/DSD/EMSD/HyD/WSD Contract No.: DC/2018/08

Monthly Summary Waste Flow Table for 2021 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	6.334	0	0	3.028	3.306	0	0	0	0	0.4	0.00847
Feb	4.008	0	0	1.461	2.547	0	0	0	0	1.4	0.01195
Mar	6.096	0	0	0	6.096	0	0	0	0	0	0.00638
Apr	4.013	0	0	0	4.013	0	0	0	0	4.2	0.00612
May	4.096	0	0	1.130	2.966	0	0	0	0	0	0.00769
June	5.882	0	0	5.212	0.670	0	0	0	0	0	0.00533
Sub-total	30.429	0	0	10.831	19.598	0	0	0	0	6.0	0.04594
July	4.0758	0	0	3.188	1.0059	0	0	0	0	0.05	0.02628
Aug	6.0636	0	0	2.8203	3.2432	0	0	0	0	1	0.01173
Sept	5.6990	0	0	4.4111	1.2879	0	0	0	0	0	0.01292
Oct											
Nov											
Dec											
Total	46.2674	0	0	21.2504	25.1350	0	0	0	0	7.05	0.09687

Remark: Use of conversion factors: density of inert C&D materials (2 ton/m^3) and general refuse (1 ton/m^3)

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
37.523	37.2	0	0	5.92	0	0	0	0	4.8	0.323

Notes: (1) The performance targets are given in PS Clause 1.104(14).
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material

Appendix J
Implementation Schedule of Recommended Mitigation Measures

Table A-1 Air Quality Impact – Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase						
S.3.5.9	S.3.2.2	All the dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation, where applicable, should be implemented. Typical dust control measures include:	Air Quality (fugitive dust) Control during Construction Phase	Contractors	At all construction areas of the site during the entire construction period	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ The works area for site clearance shall be sprayed with water before, during and after the operation so as to maintain the entire surface wet	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ Restricting heights from which materials are to be dropped, as far as practicable to minimise the fugitive dust arising from unloading/ loading	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ Immediately before leaving a construction site, all vehicles shall be washed to remove any dusty materials from the bodies and wheels. However, all spraying of materials and surfaces should avoid excessive water usage	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials will not leak from the vehicle	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ Erection of hoarding of not less than 2.4 m high from ground level along the site boundary, where appropriate	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ Any stockpile of dusty materials shall be covered entirely by impervious sheeting; and/or placed in an area sheltered on the top and 4 sides	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.5.9	S.3.2.2	▪ All dusty materials shall be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet	Air Quality (fugitive dust) Control during Construction Phase	Contractors	Ditto	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
Operational Phase						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table A-2 Noise Impact – Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase						
S.4.8.2	S.4.8.1	▪ The Contractor shall adopt the Code of Practice on Good Management Practice to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ The Contractor shall observe and comply with the statutory and non-statutory requirements and guidelines	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ Before commencing any work, the Contractor shall submit to the Engineer Representative for approval the method of working, equipment and noise mitigation measures intended to be used at the site	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ The Contractor shall devise and execute working methods to minimise the noise impact on the surrounding sensitive uses, and provide experienced personnel with suitable training to ensure that those methods are implemented	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ Noisy equipment and noisy activities should be located as far away from the NSRs as is practical	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ Unused equipment should be turned off. PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ Regular maintenance of all plant and equipment	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
S.4.8.2	S.4.8.1	▪ Material stockpiles and other structures should be effectively utilised as noise barriers, where practicable	Noise control during construction	Contractors	Ditto	Annex 5 of EIAO-TM
Operational Phase						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table A-3 Water Quality Impact – Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase						
S.5.10.1 -5.10.2	S.5.8.2 -5.8.3	Construction for the desilting facilities at intake and outfall portals should be carried out behind a temporary cofferdam which is watertight enclosure built in the reservoirs and pumped dry to expose the bottom.	Point Pollution Control	Contractors	Before construction of intake and outfall portals and remain on site until completion of intake and outfall portals and tunnel construction	Water Pollution Control Ordinance
S.5.10.3	S.5.8.4	The cofferdams should be regularly inspected and maintained to ensure no spillage of waste or wastewater into the reservoirs.	Point Pollution Control	Contractors	Before construction of intake and outfall portals and remain on site until completion of intake and outfall portals and tunnel construction	Water Pollution Control Ordinance
S. 5.10.4	S. 5.8.5	Construction of desilting facilities within works areas capable of controlling discharge of SS to comply with WPCO/TM-DSS	Point and Non-point Pollution Control	Contractors	At all construction areas of the site during the entire construction period	Water Pollution Control Ordinance
S.5.10.5	S.5.8.6	Construction runoff will be managed as per the Practice Note for Professional Persons ProPECC PN1/94 - Construction Site Drainage and the conditions of working within Water Gathering Grounds stipulated by WSD	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance Water Gathering Ground control by WSD
S.5.10.6	S. 5.8.7	A Drainage Management Plan should be prepared by the Contractor for approval by the Engineer for each of the works areas, detailing the facilities and measures to manage pollution arising from surface runoff from those works areas	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance Water Gathering Ground control by WSD
S. 5.10.7	S. 5.8.8	An Emergency Contingency Plan should also be prepared by the Contractor, detailing the response and procedures to contain and remove any accidental spillage along the temporary and permanent roads and at the site at short notice to prevent or minimize the quantities of contaminants from reaching the reservoirs and local streams leading to the reservoirs. The Emergency Contingency Plan should be submitted to the Engineer for approval	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance Water Gathering Ground control by WSD
S. 5.10.8	S. 5.8.9	▪ Surface run-off and effluent from the construction sites at	Stormwater and Non-point	Contractors	Ditto	Water Pollution Control

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
		the intake at Kowloon Byewash Reservoir and outfall at the Lower Shing Mun Reservoir will be directed towards adequately designed sand/silt removal facilities such as sand/silt traps and sediment basins to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO before discharging to discharge points downstream of the Kowloon Byewash Reservoir Dam and Lower Shing Mun Reservoir Dam respectively. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1m3/s a sedimentation basin of 30m^3 would be required and for a flow rate of 0.5m^3/s the basin would be 150m^3. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction	Source Pollution Control			Ordinance
S. 5.10.8	S. 5.8.9	▪ Channels, earth bunds or sand bag barriers will be provided on-site to properly direct stormwater to the above-mentioned facilities	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Existing on-site silt removal facilities, channels and manholes, if any, will be maintained and the deposited silt and grit will be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Other manholes, if any, including any newly constructed ones will be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Open stockpiles of materials on site will be avoided within water gathering grounds as far as practicable. All surplus spoil will be removed from water gathering grounds as soon as possible Measures will be taken to prevent the washing away of construction materials, soil, silt or debris	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Where possible, works entailing soil excavation will be minimized during the rainy season (i.e. April to September). If excavation in soil could not be avoided in these months or	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
		at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces should be covered e.g. by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (e.g. along the crest/edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm				
S. 5.10.8	S. 5.8.9	▪ Where applicable, final earthworks surfaces/ slopes will be well compacted and hydro-seeded following completion to prevent erosion	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Where surface runoff or construction effluent is likely to be contaminated with oil, properly designed and maintained petrol interceptor will be provided to meet the WPCO/TM-DSS requirements. Oil leakage or spillage shall be contained and cleaned up immediately. Detailed design of the petrol interceptor shall be provided by the Contractor before commencement of construction	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Sewage arising from the construction workers on site should be collected by temporary sanitary facilities e.g. portable chemical toilets. Portable toilets should be used coupled with tankering away services provided by a licensed collector	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ All site discharges within Inland Waters Group A must comply with the terms and conditions of a valid discharge licence issued by EPD	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Vehicle wheel washing facilities should be provided, where applicable, at the site exit such that mud, debris, etc. deposited onto the vehicle wheels or body can be washed off before the vehicles are leaving the site area	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Section of the road between the wheel washing bay and the public road should be paved with backfill to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S. 5.10.8	S. 5.8.9	▪ Vehicle washing facilities should be drained into desilting facilities before discharge. The water should be recycled on site wherever possible. It is suggested that the wash water from the wheel wash basin is either reused for site watering or pumped to the on-site desilting facilities for treatment	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	• Desilting facilities should be checked and the deposited silt and grit should be removed regularly to ensure they are working properly at all times	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	• To minimize water quality impact, recycled water should be used at the cutter face for cooling purposes. Used water should be collected and discharged to settling tank for settlement	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	• Excess water from the settling tank would be transferred to the desilting facilities for treatment before discharge. The Contractor should ensure that the discharge water from the desilting facilities and treated spent effluent arising from tunnel boring from the desilting facilities comply with the WPCO/TM-DSS requirements before discharge	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Existing on-site silt removal facilities, channels and manholes, if any, would be maintained such that the deposited silt and grit will be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times;	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ Desilting facilities should be checked and the deposited silt and grit should be removed regularly to ensure they are working properly at all times;	Stormwater and Non-point Source Pollution Control	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ The project may occasionally involve the handling of fuel and generates chemical wastes. It must be ensured that all fuel tanks and chemical storage are sited on sealed and bunded areas, provided with locks and located outside water gathering grounds as far as practicable	Protection Against Accidental Spillage	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	▪ The storage areas will be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent accidentally spilled oil, fuel or chemicals from reaching the receiving waters	Protection Against Accidental Spillage	Contractors	Ditto	Water Pollution Control Ordinance

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S. 5.10.8	S. 5.8.9	• Oil and grease removal facilities will be provided where appropriate, for example, in area near plant workshop/ maintenance areas, if any	Protection Against Accidental Spillage	Contractors	Ditto	Water Pollution Control Ordinance
S. 5.10.8	S. 5.8.9	• Chemical waste arising from the site should be properly stored, handled, treated and disposed of in compliance with the requirements stipulated under the Waste Disposal (Chemical Waste) (General) Regulation	Protection Against Accidental Spillage	Contractors	Ditto	Waste Disposal (Chemical Waste) (General) Regulation
Operational Phase						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table A-4 Waste Management Implication – Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location/ Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase						
S.6.7.1		Given the potential for secondary environmental impacts (dust, noise, water quality and visual impacts), mitigation measures are required to ensure proper handling, storage, transportation and disposal of materials at the outset and throughout the construction phase of the project	Waste management during construction	Contractors	At all construction areas of the site during the entire construction period	Waste Disposal Ordinance
S.6.7.2	S. 6.2.5	▪ An on-site environmental co-ordinator employed by the Contractor should be identified at the outset of the works. The co-ordinator shall prepare a Waste Management Plan ("WMP") in accordance with the requirements set out in the ETWB TCW No. 19/2005, Waste Management on Construction Sites. The WMP shall include monthly and yearly Waste Flow Tables ("WFT") that indicate the amounts of waste generated, recycled and disposed of (including final disposal site), and which should be regularly updated	Waste management during construction	Contractors	Ditto	ETWB TCW No. 19/2005, Waste Management on Construction Sites
S.6.7.2	S. 6.2.5	▪ The reuse/ recycling of all materials on site shall be investigated and exhausted prior to treatment/ disposal off-site	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance
S.6.7.2	S. 6.2.5	▪ Good site practices shall be adopted from the commencement of works to avoid the generation of waste, reduce cross contamination of waste and to promote waste minimisation	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance
S.6.7.2	S. 6.2.5	▪ All waste materials shall be sorted on-site into inert and non-inert C&D materials, and where the materials can be recycled or reused, they shall be further segregated. Inert material, or public fill will comprise stone, rock, concrete and soil which is suitable for land reclamation and site formation whilst non-inert materials include all other wastes generated from the construction process such as plastic packaging and vegetation (from site clearance)	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance
S.6.7.2	S. 6.2.5	▪ The Contractor shall be responsible for identifying what materials can be recycled/ reused, whether on-site or off-site. In the event of the latter, the Contractor shall make	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location/ Timing of implementation of Measures	What requirements or standards for the measures to achieve?
		arrangements for the collection of the recyclable materials. Any remaining non-inert waste shall be collected and disposed of to the public fill reception facilities whilst any inert C&D materials shall be re-used on site as far as possible. Alternatively, if no use of the inert material can be found on-site, the materials can be delivered to a public fill reception facilities after obtaining the appropriate licence				
S.6.7.2	S. 6.2.5	▪ In order to monitor the disposal of C&D material and solid wastes at public fill reception facilities and landfills, and control fly-tipping, a trip-ticket system shall be implemented by the Contractor, in accordance with the contract and the requirements of WBTC 31/2004 "Trip Ticket System for Disposal of Construction and Demolition Material"	Waste management during construction	Contractors	Ditto	WBTC 31/2004 "Trip Ticket System for Disposal of Construction and Demolition Material"
S.6.7.2	S. 6.2.5	▪ Under the Waste Disposal (Chemical Waste) (General) Regulation, the Contractor shall register as a Chemical Waste Producer if chemical wastes such as spent lubricants and paints are generated on site. Only licensed chemical waste collectors shall be employed to collect any chemical waste generated at site. The handling, storage, transportation and disposal of chemical wastes shall be conducted in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes and A Guide to the Chemical Waste Control Scheme both published by EPD	Waste management during construction	Contractors	Ditto	Waste Disposal (Chemical Waste) (General) Regulation
S.6.7.2	S. 6.2.5	▪ A sufficient number of covered bins shall be provided on site for the containment of general refuse to prevent visual impacts and nuisance to the sensitive surroundings. These bins shall be cleared daily and the collected waste disposed of to the refuse transfer station. Further to the issue of ETWB TCW No. 6/2002A, Enhanced Specification for Site Cleanliness and Tidiness, the Contractor is required to maintain a clean and hygienic site throughout the project works	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance
S.6.7.2	S. 6.2.5	▪ All chemical toilets, if any, shall be regularly cleaned and the night-soil collected and transported by a licensed contractor to a Government Sewage Treatment Works facility for disposal	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location/ Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.6.7.2	S. 6.2.5	▪ Toolbox talks should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance
S.6.7.2	S. 6.2.5	▪ The Contractor shall comply with all relevant statutory requirements and guidelines and their updated versions that may be issued during the course of project construction	Waste management during construction	Contractors	Ditto	Waste Disposal Ordinance
Operational Phase						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table A-5 Ecological Impact – Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location/ Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase						
S 8.8	N/A	Minimise the habitat loss of secondary woodland / plantation and grassland as far as possible	Reduce habitat and vegetation loss	Contractors	At all construction areas of the site during the entire construction period	Annex 16 of EIAO-TM
S 8.8	N/A	Disturbed secondary woodland / plantation and grassland should be reinstated after the completion of works	Reinstate disturbed habitats	Contractors	Worksite areas at the two portals / after completion of construction works	Annex 16 of EIAO-TM
S 8.8	N/A	Provide clear definition of site boundary	Prevent impact on offsite habitats	Contractors	At all construction areas of the site during the entire construction period	Annex 16 of EIAO-TM
S 8.8	N/A	Protect the protected plant *Pavetta hongkongensis* on its existing location; Transplant the *Pavetta hongkongensis* to other suitable location if onsite protection is not feasible.	Preserve the protected plant species	Contractors	On the vegetated slope along the existing vehicle access at worksite area at Lower Shing Mun Reservoir / Construction period	Annex 16 of EIAO-TM
S 8.8	N/A	Carry out compensatory planting if the individual of *Artocarpus hypargyreus* cannot be retained onsite	Mitigate the tree removal	Contractors	worksite area at Kwoloon Byewash Reservoir / Construction Period	ETWB TCW No. 3/2006
S 8.8	N/A	Workers should avoid eating and leave food in works area and avoid feeding the wildlife; Fishes observed remaining at the proposed works area during the draining down process should be translocated to the portion of the reservoir outside the cofferdam.	Avoidance of injury to wildlife	Contractors	At all construction areas of the site during the entire construction period	Annex 16 of EIAO-TM
S 8.8	N/A	Implement standard good site practices for dust suppression	Avoid dust deposition on vegetation	Contractors	At all construction areas of the site during the entire construction period	EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S 8.8	N/A	Implement standard good site practices for water quality control	Avoid site runoff to nearby habitats	Contractors	At all construction areas of the site during the entire construction period	Water Pollution Control Ordinance
S 8.8	N/A	Workers shall not disturb birds and other wildlife; Litter shall not be burned on-site but shall be removed off-site;	Avoid disturbance to wildlife	Contractors	At all construction areas of the site during the entire construction period	Annex 16 of EIAO-TM

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location/ Timing of implementation of Measures	What requirements or standards for the measures to achieve?
		Machinery not in use should be switched off to minimize the noise nuisance; No fishing is allowed in the reservoir without permission.				
Operational Phase						
S 8.8	N/A	Compensate the habitat loss (grassland and woodland) by restoration of same type of habitats to be lost. The compensatory ratio should not be less than 1:1 in terms of area.	Mitigate the temporary habitat loss	Contractors	Woodland at worksite area at Kowloon Byewash Reservoir and Grassland at worksite area at Lower Shing Mun Reservoir / Operational period	Annex 16 of EIAO-TM

Table A-6 Landscape and Visual Impact – Implementation Schedule of Recommended Mitigation Measures

Id No.	Landscape and Visual Mitigation Measures	Location	Funding	Implementation/ Maintenance Agent	Relevant Standard or Requirement	Implementation Stage			Timing of Implementation	Objectives of the Recommended Measure and Main Concern to address
LMM1	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical	Site	WSD	Contractor	TM-EIA Annex 18		√		Throughout construction phase	To provide a viable growing medium suited to the existing conditions and reduce the need for the importation of top soil
LMM2	Existing Trees to be retained on site should be carefully protected during construction	Site	WSD	Contractor	TM-EIA Annex 18, ETWB TCW No. 2/2004 & ETWB TCW No. 3/2006		√		Throughout construction phase	To ensure the success of the tree preservation proposal
LMM3	Compensatory tree planting should be provided to compensate for felled trees	Site	WSD	Contractor	TM-EIA Annex 18, ETWB TCW No. 2/2004 & ETWB TCW No. 3/2006		√		Throughout design and construction phase	The planting proposal seeks to compensate for the predicted tree loss resulting form the construction, visually integrate the proposals within its existing landscape framework and provide an improved visual amenity
LMM4	Erection of decorative screen hoarding compatible with surrounding setting	Site	WSD	Contractor	TM-EIA Annex 18 and BD		√		Throughout construction phase	To integrate the construction site with the existing environment
LMM5	Locations of the site office, storage or workshops should be carefully adjusted to areas out of tree protection zones.	Site	WSD	Contractor	TM-EIA Annex 18 and BD	√			Throughout design phase	To avoid unnecessary felling of trees
LMM6	Selection of intake and outfall portals to areas enclosed by existing topography or vegetation	Site	WSD	Contractor	TM-EIA Annex 18 and BD	√			Throughout design phase	To preserve the existing topography and as many as trees as possible
LMM7	Appearance of the water intake and outfall structures	Site	WSD	Contractor	TM-EIA Annex 18 and BD	√			Throughout design phase	To reduce the apparent visual mass of water intake and outfall structures
LMM8	Reinstatement of disturbed vegetation at both portal	Site	WSD	Contractor	TM-EIA Annex 18			√	After the completion of construction	To mitigate disturbance to vegetation arising from the proposed construction

Id No.	Landscape and Visual Mitigation Measures	Location	Funding	Implementation/ Maintenance Agent	Relevant Standard or Requirement	Implementation Stage			Timing of Implementation	Objectives of the Recommended Measure and Main Concern to address
	areas								works	

Table A-7 Cultural Heritage – Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location/ Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase						
S 10.7	S8.1.2	Condition Survey for the identified historic items and monitoring of vibration levels if required.	Prevention of structural damage to the identified historic items	Contractors	Condition survey to be undertaken prior to the construction phase and vibration monitoring to be undertaken during the construction phase if required.	None
Operational Phase						
N/A	N/A	None	None	None	None	None

Appendix K
Tentative Monitoring Schedule of Next Reporting Period

IRTS – EM&A Monitoring & Inspection Schedule

October 2021

Sun	Mon	Tue	Wed	Thur	Fri	Sat
					1 Impact Water Quality Monitoring	2
3 Noise Monitoring at NM1 (09:00-19:00)	4 Impact Water Quality Monitoring	5 Weekly Site Inspection	6 Impact Water Quality Monitoring & Noise Monitoring at NM1 & NM2 (09:00-19:00); NM1 (19:00-23:00)	7	8 Impact Water Quality Monitoring	9
10 Noise Monitoring at NM1 (09:00-19:00)	11 Impact Water Quality Monitoring	12 Weekly Site Inspection	13 Impact Water Quality Monitoring & Noise Monitoring at NM1 & NM2 (09:00-19:00); NM1 (19:00-23:00)	14	15 Impact Water Quality Monitoring	16
17 Noise Monitoring at NM1 (09:00-19:00)	18 Impact Water Quality Monitoring	19 Weekly Site Inspection	20 Impact Water Quality Monitoring & Noise Monitoring at NM1 & NM2 (09:00-19:00); NM1 (19:00-23:00)	21	22 Impact Water Quality Monitoring	23
24 Noise Monitoring at NM1 (09:00-19:00)	25 Impact Water Quality Monitoring	26 Weekly Site Inspection	27 Impact Water Quality Monitoring & Noise Monitoring at NM1 & NM2 (09:00-19:00); NM1 (19:00-23:00)	28	29 Impact Water Quality Monitoring	30
31 Noise Monitoring at NM1 (09:00-19:00)						

= General Holiday

Appendix L

Cumulative Statistics on Complaints, Notifications of Summons And Successful Prosecutions

Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 Sep 2021 - 30 Sep 2021	0	1	N/A

Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Details
1 Sep 2021 - 30 Sep 2021	0	0	N/A

Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Details
1 Sep 2021 - 30 Sep 2021	0	0	N/A