

**PCCW Global<sup>®</sup>**

## **Pacific Light Cable Network (PLCN) - Deep Water Bay (EP-539/2017)**

### **Baseline Water Quality Monitoring Report (Zone A)**

Mar 2018

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**Pacific Light Cable Network (PLCN)  
– Deep Water Bay  
(EP-539/2017)**

**Baseline Water Quality Monitoring Report  
(Zone A)**

*ERM Document Code: 0448409.doc*

Client: PCCW Global (HK) Limited		GMS No: 0448409			
Summary:  This report presents the monitoring requirements, methodologies and results of the baseline ambient marine water quality measurements at the monitoring locations for Zone A in accordance with the Project Profile (PP-550/2017).		Date: 14 March 2018			
		Approved by : 			
		Terence Fong  Partner			
1	Baseline Water Quality Monitoring Report (Zone A)	NN	FZino	TFONG	14 Mar 18
0	Baseline Water Quality Monitoring Report (Zone A)	NN	FZino	TFONG	28 Feb 18
Revision	Description	By	Checked	Approved	Date
		Distribution <input checked="" type="checkbox"/> Government <input checked="" type="checkbox"/> Public <input type="checkbox"/> Confidential			
		 			

## Pacific Light Cable Network (PLCN) – Deep Water Bay Environmental Certification Sheet EP-539/2017

### Reference Document/Plan

Document/ <del>Plan to be Certified</del> / Verified:	Baseline Water Quality Monitoring Report (Zone A)
Date of Report:	14 March 2018
Date prepared by ET:	ERM-Hong Kong Ltd
Date received by IEC:	Ecosystem Ltd

### Reference EM&A Manual/ EP Requirement

EM&A Manual Requirement:	Section 2
<i>Content:</i>	<i>Water Quality Monitoring</i>
<p>G.2.3.1 “Baseline Monitoring will comprise sampling on three occasions (days) prior to, but no more than six weeks before, cable installation/ repair operation work. ...”</p> <p>G2.5 The reports to be provided shall include:</p> <ul style="list-style-type: none"> <li>• Baseline Monitoring Report;</li> <li>• Weekly Impact Monitoring Reports; and</li> <li>• Post Project Monitoring Report.</li> </ul> <p>The Baseline Monitoring Report shall be provided no later than two weeks before the cable installation/ repair operation work and the report should be submitted to EPD for agreement on the Action/Limit Levels.</p>	
EP Condition:	Conditions No. 3.2 – 3.3
<i>Content:</i>	<i>Water Quality Monitoring</i>
<p>3.2 Samples, measurements and necessary remedial actions shall be taken in accordance with the EM&amp;A requirements described in the Project Profile (Register No. PP-550/2017) by:</p> <ul style="list-style-type: none"> <li>(a) conducting baseline environmental monitoring;</li> <li>(b) conducting impact monitoring; and</li> <li>(c) carrying out remedial actions in accordance to the EM&amp;A requirements as described in the Project Profile (Register No. PP-550/2017), or as agreed by the Director, in case where specified criteria in the EM&amp;A requirements are exceeded.</li> </ul> <p>3.3 Submit to the Director three hard copies and one electronic copy of the following, as defined in the EM&amp;A requirements described in the Project Profile (Register No. PP-550/2017):</p> <ul style="list-style-type: none"> <li>(a) Baseline Monitoring Report on water quality no later than 2 week before the commencement of cable installation works;</li> <li>(b) Weekly EM&amp;A Report no later than 3 days after the relevant monitoring data are collected or become available during the cable installation works; and</li> <li>(c) Final EM&amp;A Report within one month after completion of the construction works.</li> </ul>	

## ET Certification

I hereby certify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-539/2017.

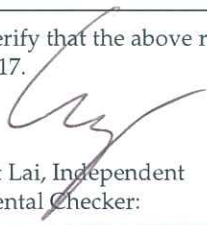


Terence Fong, Environmental  
Team Leader:

Date: 14 March 2018

## IEC Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-539/2017.



Dr Vincent Lai, Independent  
Environmental Checker:

Date: 15 March 2018

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## EXECUTIVE SUMMARY

### Baseline Water Quality Monitoring (Zone A)

Baseline water quality monitoring in Zone A was conducted between 5<sup>th</sup> and 9<sup>th</sup> February 2018 at eight (8) designated monitoring stations (including five Sensitive Receiver Stations, one Gradient Station and two Control Stations). The monitoring was carried out over 3 days, at mid-flood and mid-ebb tides, at three depths (surface, middle and bottom). The intervals between two sets of monitoring were not less than 36 hours. During the monitoring period, no major activities influencing water quality were observed in the vicinity of the Project's marine works area.

Water quality monitoring results are, therefore, considered to be representative of the current baseline conditions of the area where Phase 1 marine cable installation will be undertaken for the Project.

In accordance with *Annex G* of the Project Profile, the baseline monitoring results have been used to determine the Action and Limit Levels for Dissolved Oxygen (DO), Suspended Solids (SS) and Turbidity for the impact water quality monitoring which will be conducted during Project marine installation works. The water quality Action and Limit Levels for Zone A are summarized in *Table 1* below.

**Table 1**      **Action and Limit Levels for Water Quality – Zone A**

<b>Parameter</b>	<b>Action Level</b>	<b>Limit Level</b>
SS in mg L <sup>-1</sup> (Depth-averaged)	95%-ile of baseline data (6.97 mg L <sup>-1</sup> ), or	99%-ile of baseline data (7.22 mg L <sup>-1</sup> ), and
	20% exceedance of value at any impact station compared with corresponding data from control station	30% exceedance of value at any impact station compared with corresponding data from control station
DO in mg L <sup>-1</sup>	<u>Surface and Middle</u>	<u>Surface and Middle</u>
	5%-ile of baseline data for surface and middle layer (7.88 mg L <sup>-1</sup> )	4 mg L <sup>-1</sup> or 1%-ile of baseline data for surface and middle layer (7.84 mg L <sup>-1</sup> )
	<u>Bottom</u>	<u>Bottom</u>
	5%-ile of baseline data for bottom layer (7.81 mg L <sup>-1</sup> )	2 mg L <sup>-1</sup> or 1%-ile of baseline data for bottom layer (7.80 mg L <sup>-1</sup> )
Turbidity in NTU (Depth-averaged)	95%-ile of baseline data (5.51 NTU), or	99%-ile of baseline data (5.79 NTU), and
	20% exceedance of value at any impact station compared with corresponding data from control station	30% exceedance of value at any impact station compared with corresponding data from control station

**Notes:**

- a. "Depth-averaged" is calculated by taking the arithmetic means of reading of all sampled depths.
- b. For DO, non-compliance of the water quality limits occurs when the monitoring result is lower than the limits.
- c. For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- d. The Action and Limit Level for DO for surface and middle layer were calculated from the combined pool of baseline surface layer data and baseline middle layer data.

# 1 INTRODUCTION

## 1.1 BACKGROUND

In order to help meet the tremendous telecommunication services requirements between Asia and North America, the **PLCN Consortium** has decided to build a submarine telecommunication cable system, which will be approximately 12,800 km in length, connecting Hong Kong and the United States.

The cable will connect to Deep Water Bay (DWB) within the HKSAR. **PCCW Global (HK) Limited (PCCWG)** is providing the cable landing point and the associated cable landing service in Hong Kong for the PLCN Consortium.

The route of the proposed PLCN submarine cable system is depicted in *Figure 1.1*. The proposed cable would land at an existing manhole location at DWB and the location of the landing site is presented in *Figure 1.2a*. It should be noted that DWB is currently the landing site for a number of submarine cables.

The cable will travel from DWB southward approaching the East Lamma Channel. Near to Round Island, the cable is approximately parallel to the East Lamma Channel until the south of Stanley Peninsula. The cable will then travel eastward along the boundary of HKSAR waters and will enter the South China Sea.

The Project Profile (PP-550/2017) which includes an assessment of the potential environmental impacts associated with the installation of the submarine telecommunications cable system within HKSAR (including connection to land at DWB) was prepared and submitted to the Environmental Protection Department (EPD) under section 5.(1) (b) and 5.(11) of the *Environmental Impact Assessment Ordinance (EIAO)* for the application for Permission to apply directly for Environmental Permit (EP). On 1 June 2017, EPD issued a letter to PCCWG permitting direct application for an environmental permit and following an application, EPD subsequently issued an Environmental Permit (EP-539/2017) on 10 July 2017.

Pursuant to *Condition 3.1* of the EP, an environmental monitoring and audit (EM&A) programme, as set out in the Project Profile is required for this Project, with baseline water quality monitoring data collected prior to the start of cable installation works and Action and Limit Levels derived from these data.

Cable installation is scheduled to be carried out in two phases, with Phase 1 situated in part of Zone A only and Phase 2 covering Zones A and B (as well as the alignment outside both Zone A or Zone B). The phasing of the cable installation works is shown in *Figures 2.1 to 2.3*.



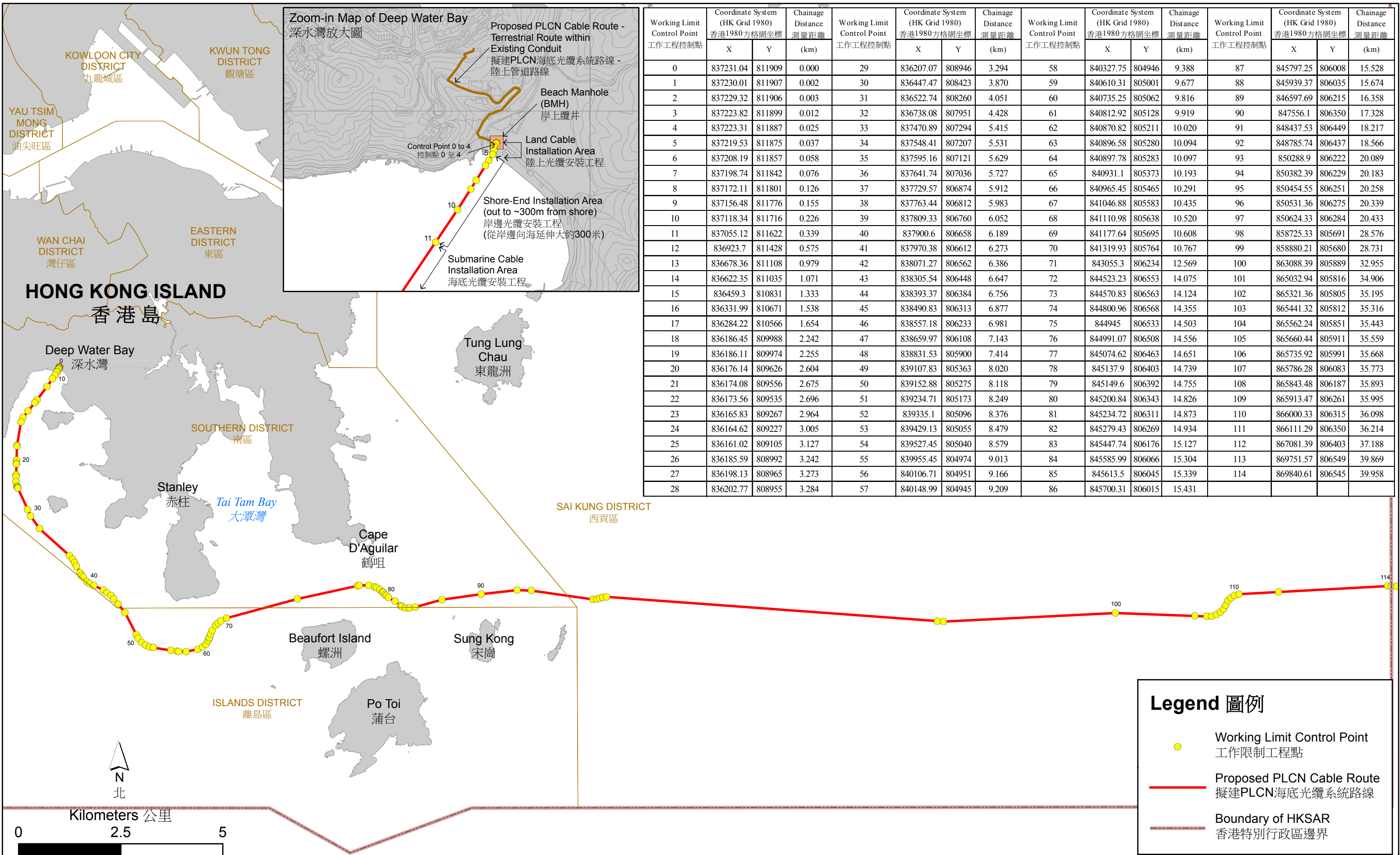
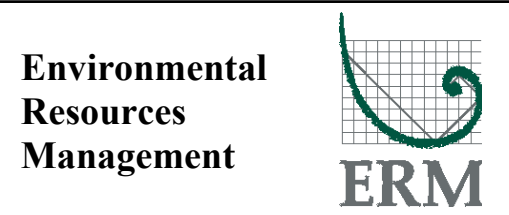


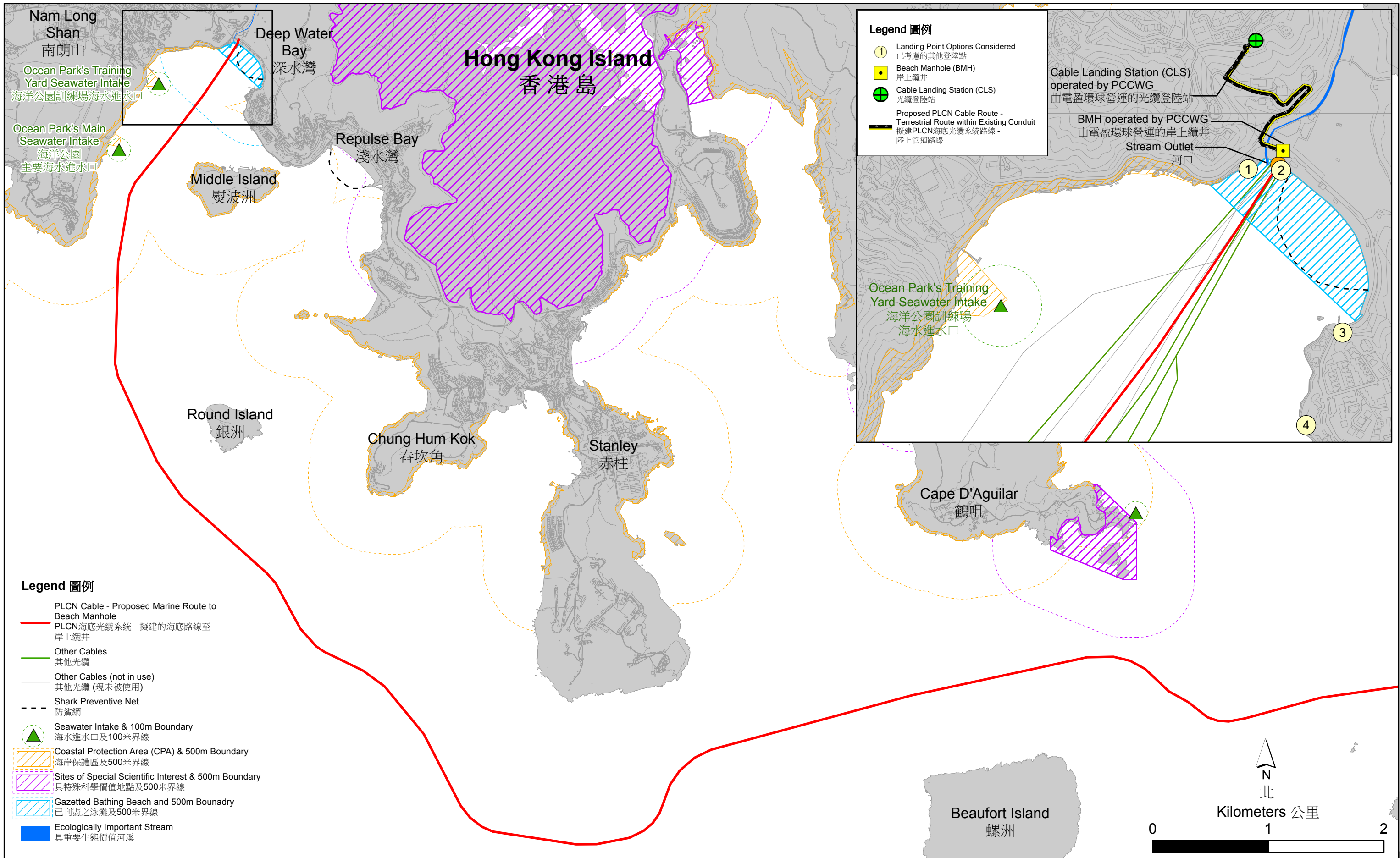
Figure 1.1  
圖 1.1  
Proposed PLCN Cable Route  
擬建PLCN海底光纜系統路線

File: T:\GIS\CONTRACT\0335723\Mxd\0335723\_Proposed\_PLCN\_Cable\_Route\_bil.mxd  
Date: 29/3/2017

**Legend 圖例**

- Working Limit Control Point  
工作限制工程點
- Proposed PLCN Cable Route  
擬建PLCN海底光纜系統路線
- Boundary of HKSAR  
香港特別行政區邊界





Given the commencement dates for Phase 1 and Phase 2 cable installation are currently scheduled to start at least two months apart, it is recommended to present the baseline data in separate reports for each Phase (i.e. Only Zone A for Phase 1 as show in *Figure 2.2*). The corresponding Action and Limit Levels will also be derived from the baseline data for each zone.

The tentative schedule is as follows:

- 1) **Phase 1 Land Cable Installation and Shore-End Cable Installation:** Mini shore-end cable installation to Beach Manhole at Deep Water Bay (DWB), involving land trench excavation and shore-end cable installation of the PLCN cable (ie from BMH out to approximately 650 m from Beach Man Hole) using diver jetting; Land trenching works tentatively scheduled between 1 - 14 Mar 2018 and near shore marine diver jetting works within silt curtain tentatively scheduled between 20-29 Mar 2018.
- 2) **Phase 2 Submarine Cable Installation:** Installation of PLCN cable from shore-end (ie approximately 650m from Beach Man Hole) to HK SAR marine eastern boundary, involving jetting technique and potential diver jetting in specific areas (eg HK Electric Pipeline crossing). Marine installation works using jetting technique tentatively scheduled to commence Jun/Jul 2018.

## **1.2 PURPOSE OF THIS REPORT**

The purpose of this *Baseline Water Quality Monitoring Report – Zone A* is to determine the baseline marine water quality at the designated monitoring locations around the Project works area for Phase 1 prior to the commencement of the Phase 1 Project marine installation works. These baseline conditions are used to determine Action and Limit Levels which are used as the basis for assessing water quality impacts, if any, and for compliance monitoring during the Phase 1 Project marine installation works.

Under the requirement of *Condition 3.3(a)* of the *EP*, the baseline monitoring report on water quality shall be prepared and submitted to the DEP no later than two weeks before the commencement of cable installation works.

This baseline EM&A exercise covers only Zone A as stipulated in *Table G1* of the approved Project Profile. A separate EM&A exercise will be conducted for Phase 2 cable installation, covering Zones A and B before the commencement of the Phase 2 cable installation.

### **1.3 STRUCTURE OF THE REPORT**

The remainder of the report is structured as follows:

#### ***Section 1: Introduction***

Provide details of the background, purpose and structure of the report.

#### ***Section 2: Water Quality Monitoring***

Summarize the water quality monitoring locations, frequency, monitoring methodology and baseline monitoring results, and establish the Action and Limit Levels in accordance with the *Project Profile*.

#### ***Section 3: Conclusion***

Conclude the representativeness of the baseline monitoring results and observations for the Project.

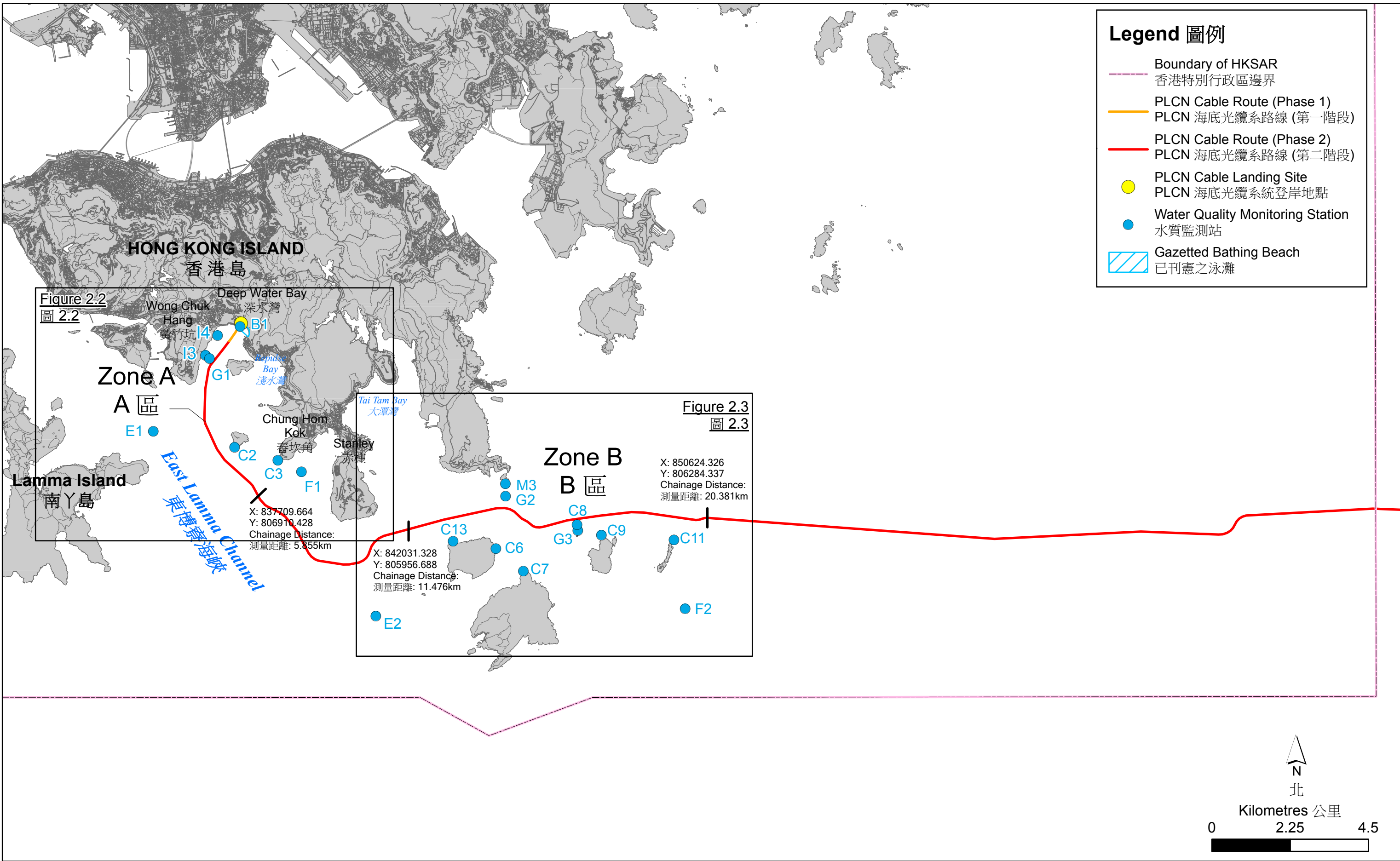


Figure 2.1  
圖 2.1

Water Quality Monitoring Stations - Overview  
水質監測圖 - 概覽

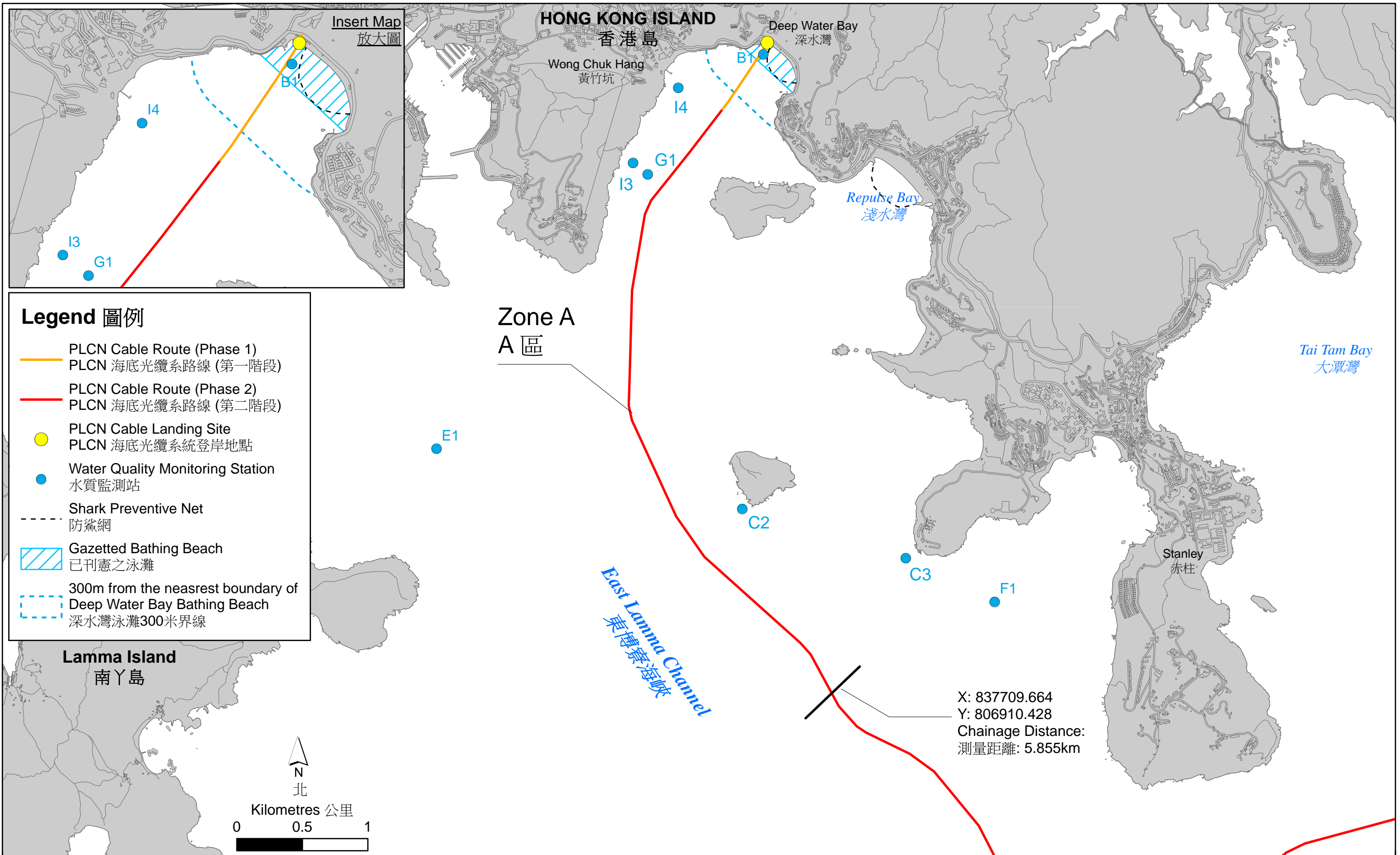


Figure 2.2  
圖 2.2

Water Quality Monitoring Stations - Zone A  
水質監測站 - A 區

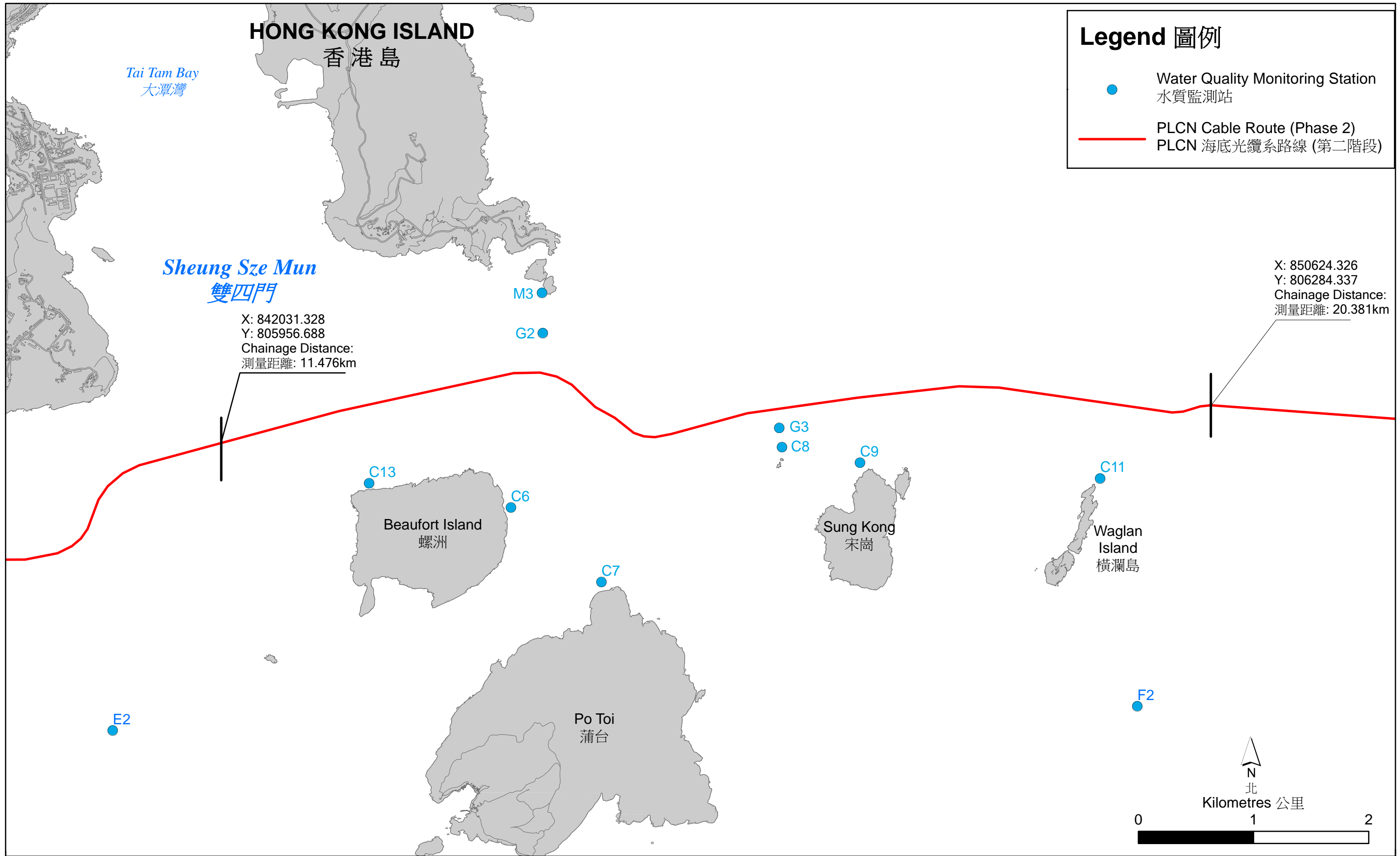


Figure 2.3  
圖 2.3

Water Quality Monitoring Stations - Zone B  
水質監測站 - B 區

## 2 WATER QUALITY MONITORING

### 2.1 MONITORING LOCATION

Baseline water quality monitoring in Zone A was conducted prior to the commencement of Project marine installation works at the monitoring stations listed in *Table 2.1* and shown in *Figure 2.1* and *Figure 2.2*.

**Table 2.1** *Water Quality Monitoring Stations*

Monitoring Station	Nature	Easting	Northing
Zone A: The waters from Aberdeen to Chung Hom Kok where a number of sensitive receivers are located close to the cable alignment. Covers the cable alignment between Chainage 0 and 5.851 km.			
B1	Impact Station (Adjacent to Deep Water Bay Beach)	837188	811783
I3	Impact Station (Ocean Park's Main Seawater Intake)	836195	810956
I4	Impact Station (Ocean Park's Training Yard Seawater Intake)	836539	811529
C2	Impact Station (Coral sites along the coast of Round Island)	847579	805787
C3	Impact Station (Coral sites along the coast of Chung Hom Kok)	838275	807941
G1	Gradient Station (Between Ocean Park's Main Seawater Intake and cable alignment)	836306	810867
E1	Control Station for Zone A in Ebb Tide	834695	808775
F1	Control Station for Zone A in Flood Tide	838953	807607

### 2.2 SAMPLING AND TESTING METHODOLOGY

#### 2.2.1 Monitoring Parameters

The parameters measured *in situ* were:

- dissolved oxygen (DO) (% saturation and mg L<sup>-1</sup>)
- temperature (°C)
- turbidity (NTU)
- salinity (‰ or ppt)

The only parameter to be measured in the laboratory is:

- suspended solids (SS) (mg L<sup>-1</sup>)

In addition to the water quality parameters, other relevant data has also been measured and recorded in field logs, including the location of the sampling stations, water depth, time, weather conditions, sea conditions, tidal state,



current direction and speed, special phenomena and work activities being undertaken around the monitoring and works area that may influence the monitoring results.

### 2.2.2 Monitoring Equipment

Table 2.2 summaries the equipment used for the baseline water quality monitoring.

**Table 2.2** *Equipment used during Baseline Water Quality Monitoring*

Equipment	Model
Global Positioning Device	Garmin etrex 20x & Furuno GP-170E (dGPS)
Water Depth Gauge	Sontek Hydrosurveyor / Sontek Riversurveyor
Water Sampling Equipment	Wildlife 1120 – 2.2L alpha vertical sampler
Salinity, DO, Temperature Measuring Meter	YSI ProDSS (Multi-Parameter)
Current Velocity and Direction	Sontek Hydrosurveyor / Sontek Riversurveyor
Turbidity Meter	YSI ProDSS (Multi-Parameter)

### 2.2.3 Monitoring Frequency and Timing

The water quality monitoring was carried out on three occasions (days) and the intervals between two sets of monitoring were not less than 36 hours. The water quality sampling was undertaken during mid-flood and mid-ebb tidal state on each sampling occasion.

Reference was made to the predicted tides at Waglan Island, which is the tidal station nearest to the Project Site, published on the website of the Hong Kong Observatory <sup>(1)</sup>. Based on the predicted tidal levels at Waglan Island, the baseline water quality monitoring was conducted between 5<sup>th</sup> and 9<sup>th</sup> February 2018, following the schedule presented in *Annex A*.

### 2.2.4 Sampling/ Testing Protocol

All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use (see calibration reports in *Annex B*), and will subsequently be re-calibrated at-monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes were checked with certified standard solutions before each use.

For the on-site calibration of field equipment, the *BS 1427: 1993, Guide to Field and On-Site Test Methods for the Analysis of Waters* was observed. Sufficient stocks of spare parts were maintained for replacements when necessary. Backup monitoring equipment was made available.

Water samples for SS measurements were collected in high density polythene bottles, packed in ice (cooled to 4° C without being frozen), and delivered to a HOKLAS laboratory as soon as possible after collection.

<sup>(1)</sup> Hong Kong Observatory (2017) <http://www.hko.gov.hk/tide/predtide.htm?s=WAG> [Accessed in February 2018]

Two replicate samples were collected from each of the monitoring events for *in situ* measurement and lab analysis.

### 2.2.5 Laboratory Analysis

All laboratory work was carried out in a HOKLAS accredited laboratory. Water samples of about 1,000 mL were collected at the monitoring and control stations for carrying out the laboratory determinations. The determination work started within the next working day after collection of the water samples. The SS laboratory measurements were provided within 2 days of the sampling event (48 hours). The analyses followed the standard methods as described in APHA Standard Methods for the *Examination of Water and Wastewater*, 19th Edition, unless otherwise specified (APHA 2540D for SS).

The QA/QC details were in accordance with requirements of HOKLAS or another internationally accredited scheme (*Annex C*).

### 2.2.6 Sampling Depths & Replication

At each station, measurements and water samples were taken at three depths, namely, 1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth less than 6 m, the mid-depth sample may be omitted. For stations that are less than 3 m in depth, only the mid-depth sample was taken.

For *in situ* measurements, duplicate readings were made at each water depth at each station. Duplicate water samples were collected at each water depth at each station.

## 2.3 BASELINE MONITORING RESULTS

The monitoring data and graphical presentations for baseline water quality monitoring are provided in *Annex D*. No marine construction activities were observed in the vicinity of the monitoring stations during the baseline monitoring. No other major activities influencing water quality were identified during the monitoring period, and sea conditions were moderate during the baseline monitoring period.

The observations from the baseline monitoring results are as following:

- For all monitoring stations, water quality was variable throughout the baseline monitoring period and this represented natural fluctuation in water quality;
- Dissolved Oxygen (DO) levels were recorded to stay at a similar level across all the monitoring stations within the baseline monitoring period;
- DO levels at all depths were generally high for all samples; DO levels smaller than 4 mg L<sup>-1</sup> were not recorded;

- Variations of Turbidity and SS levels were observed within the baseline monitoring period;
- Range of Turbidity is around 2 – 3 NTU and range of SS is 2-5 mg L<sup>-1</sup>.

#### 2.4 ACTION AND LIMIT LEVELS

The Action and Limit Levels were set in *Annex G* of the Project Profile and the proposed Action and Limit Levels were determined as shown in *Table 2.3*.

**Table 2.3** *Determination of Action and Limit Levels for Water Quality*

Parameter	Action Level	Limit Level
SS in mg L <sup>-1</sup> (Depth-averaged)	95%-ile of baseline data or	99%-ile of baseline data, and
	20% exceedance of value at any impact station compared with corresponding data from control station	30% exceedance of value at any impact station compared with corresponding data from control station
DO in mg L <sup>-1</sup>	<u>Surface and Middle</u>	<u>Surface and Middle</u>
	5%-ile of baseline data for surface and middle layer	4 mg L <sup>-1</sup> or 1%-ile of baseline data for surface and middle layer
	<u>Bottom</u>	<u>Bottom</u>
	5%-ile of baseline data for bottom layers	2 mg L <sup>-1</sup> or 1%-ile of baseline data for bottom layer
Turbidity in NTU (Depth-averaged)	95%-ile of baseline data, or	99%-ile of baseline data, and
	20% exceedance of value at any impact station compared with corresponding data from control station	30% exceedance of value at any impact station compared with corresponding data from control station
<b>Notes:</b>		
a. "Depth-averaged" is calculated by taking the arithmetic means of reading of all sampled depths.		
b. For DO, non-compliance of the water quality limits occurs when the monitoring result is lower than the limits.		
c. For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.		
d. Limit level for DO was derived from the Water Quality Objectives (WQO) for Southern, Eastern Buffer, and Mirs Bay Water Control Zones under the Water Pollution Control Ordinance (WPCO) Chapters 358I, 358Y, and 358U respectively.		

Action and Limit Levels have been determined based on the baseline water quality monitoring data for all monitoring stations in Zone A collected in February 2018. The results are presented in *Table 2.4*. Please note that the results are used to determine the Action and Limit Levels for the Phase 1 Project marine installation works to be undertaken in Zone A.

**Table 2.4 Action and Limit Levels for Water Quality – Zone A**

<b>Parameter</b>	<b>Action Level</b>	<b>Limit Level</b>
SS in mg L <sup>-1</sup> (Depth-averaged)	95%-ile of baseline data (6.97 mg L <sup>-1</sup> ), or	99%-ile of baseline data (7.22 mg L <sup>-1</sup> ), and
	20% exceedance of value at any impact station compared with corresponding data from control station	30% exceedance of value at any impact station compared with corresponding data from control station
DO in mg L <sup>-1</sup>	<u>Surface and Middle</u>	<u>Surface and Middle</u>
	5%-ile of baseline data for surface and middle layer (7.88 mg L <sup>-1</sup> )	4 mg L <sup>-1</sup> or 1%-ile of baseline data for surface and middle layer (7.84 mg L <sup>-1</sup> )
	<u>Bottom</u>	<u>Bottom</u>
	5%-ile of baseline data for bottom layer (7.81 mg L <sup>-1</sup> )	2 mg L <sup>-1</sup> or 1%-ile of baseline data for bottom layer (7.80 mg L <sup>-1</sup> )
Turbidity in NTU (Depth-averaged)	95%-ile of baseline data (5.51 NTU), or	99%-ile of baseline data (5.79 NTU), and
	20% exceedance of value at any impact station compared with corresponding data from control station	30% exceedance of value at any impact station compared with corresponding data from control station

**Notes:**

- a. "Depth-averaged" is calculated by taking the arithmetic means of reading of all sampled depths.
- b. For DO, non-compliance of the water quality limits occurs when the monitoring result is lower than the limits.
- c. For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- d. The Action and Limit Level for DO for surface and middle layer were calculated from the combined pool of baseline surface layer data and baseline middle layer data.

### 3 CONCLUSION

Baseline water quality monitoring in Zone A was conducted between 5<sup>th</sup> and 9<sup>th</sup> February 2018 at 8 designated monitoring stations (including 5 Sensitive Receiver Stations, 1 Gradient Station and 2 Control Stations). The monitoring was carried out over 3 days, at mid-flood and mid-ebb tides, at three depths (surface, middle and bottom). The intervals between two sets of monitoring were not less than 36 hours. During the monitoring period, no major activities influencing water quality were observed in the vicinity of the Project's marine works area. Water quality monitoring results are, therefore, considered to be representative of the current baseline conditions of the area where Phase 1 marine cable installation will be undertaken for the Project.

The baseline monitoring results were used to determine the Action and Limit Levels for the DO, SS and Turbidity for impact monitoring to be conducted at Zone A during Phase 1 Project cable installation works.

Annex A

## Baseline Water Quality Monitoring Schedule (Zone A)

ANNEX A

PLCN Baseline Water Quality Monitoring Schedule - Zone A

FEBRUARY 2018

■ Sunday or Public Holiday

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
			1	2	3	4
ebb tide 13:56 - 17:56 flood tide 8:07 - 12:07		ebb tide 15:53 - 19:53 flood tide 9:30 - 13:30		ebb tide 19:37 - 23:37 flood tide 11:02 - 15:02		
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Annex B

## Calibration Reports of Multi-parameter Sensor





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. : AH020037  
Date of Issue : 07 February 2018  
Page No. : 1 of 2

### PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.

Rm 811, Hin Pui House,  
Hin Keng Estate, Tai Wai  
New Territories, Hong Kong  
Attn: Mr. Thomas WONG

### PART B – DESCRIPTION

Name of Equipment : YSI ProDSS (Multi-Parameters)  
Manufacturer : YSI (a xylem brand)  
Serial Number : 17E100747  
Date of Received : Feb 01, 2018  
Date of Calibration : Feb 01, 2018 to Feb 01, 2018  
Date of Next Calibration<sup>(a)</sup> : May 01, 2018

### PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

<u>Parameter</u>	<u>Reference Method</u>
pH at 25°C	APHA 21e 4500-H <sup>+</sup> B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
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<sup>(b,c)</sup>

#### (1) pH at 25°C

Target (pH unit)	Displayed Reading <sup>(d)</sup> (pH Unit)	Tolerance <sup>(e)</sup> (pH Unit)	Results
4.00	4.08	+0.08	Satisfactory
7.42	7.48	+0.06	Satisfactory
10.01	10.03	+0.02	Satisfactory

Tolerance of pH should be less than  $\pm 0.10$  (pH unit)

#### (2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
14.0	13.8	-0.2	Satisfactory
26.0	25.8	-0.2	Satisfactory
33.0	33.1	+0.1	Satisfactory

Tolerance limit of temperature should be less than  $\pm 2.0$  (°C)

~ CONTINUED ON NEXT PAGE ~

#### Remark(s): -

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

APPROVED SIGNATORY :

  
FUNG Yuen-ching Aries  
Laboratory Manager



## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH020037  
Date of Issue : 07 February 2018  
Page No. : 2 of 2

### PART D – CALIBRATION RESULTS (Cont'd)

#### (3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.03	0.03	Satisfactory
1.95	1.88	-0.07	Satisfactory
3.68	3.61	-0.07	Satisfactory
6.26	6.20	-0.06	Satisfactory

Tolerance limit of dissolved oxygen should be less than  $\pm 0.20$  (mg/L)

#### (4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading ( $\mu\text{S}/\text{cm}$ )	Displayed Reading ( $\mu\text{S}/\text{cm}$ )	Tolerance (%)	Results
0.001	146.9	144.2	-1.8	Satisfactory
0.01	1412	1383	-2.1	Satisfactory
0.1	12890	12603	-2.2	Satisfactory
0.5	58670	57995	-1.2	Satisfactory
1.0	111900	109400	-2.2	Satisfactory

Tolerance limit of conductivity should be less than  $\pm 10.0$  (%)

#### (5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.82	-1.8	Satisfactory
20	19.81	-1.0	Satisfactory
30	29.74	-0.9	Satisfactory

Tolerance limit of salinity should be less than  $\pm 10.0$  (%)

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading <sup>(f)</sup> (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.1	--	--
10	10.1	1.0	Satisfactory
20	20.4	2.0	Satisfactory
100	103.2	3.2	Satisfactory
800	781.2	-2.3	Satisfactory

Tolerance limit of turbidity should be less than  $\pm 10.0$  (%)

~ END OF REPORT ~

Remark(s): -

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

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

Annex C

## QA/QC Results for Suspended Solids Testing

QA/QC Results of Laboratory Analysis of Total Suspended Solids

Sampling Date	Sample Duplicate		Method Blank *	Laboratory Control Spike
	Sample ID	% Error		% Recovery **
5/2/2018	E1/S/1	38	<0.5	106
	G1/B/1	22		
	I4/M/1	16.7	<0.5	109
	F1/S/1	9.23		
	C2/B/1	9.66	<0.5	112
	E1/M/1	14.3		
	I3/S/1	0	<0.5	112
	I4/B/1	0		
	F1/M/1	25.6	<0.5	109
	C3/S/1	2.56		
7/2/2018	E1/S/1	40.8	<0.5	106
	G1/B/1	20.6		
	I4/M/1	16.7	<0.5	109
	F1/S/1	27.7		
	C2/B/1	4	<0.5	108
	E1/M/1	30.1		
	I3/S/1	13.2	<0.5	98.5
	I4/B/1	5.56		
	F1/M/1	3.51	<0.5	112
	C3/S/1	18.2		
9/2/2018	E1/S/1	12.8	<0.5	110
	G1/B/1	6.25		
	I4/M/1	27.7	<0.5	102
	F1/S/1	25.9		
	C2/B/1	27.8	<0.5	110
	E1/M/1	26		
	I3/S/1	23.6	<0.5	110
	I4/B/1	5.02		
	F1/M/1	15.2	<0.5	108
	C3/S/1	17.4		

Note: (\*) Reporting limit of SS is 0.5 mg/L.

(\*\*) % Recovery of laboratory control spike should be between 85% to 115%.



### CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENOVATIVE ENVIRONMENTAL SERVICE LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 6
<i>Contact</i>	: MR THOMAS WONG	<i>Contact</i>	: Richard Fung	<i>Work Order</i>	: <b>HK1815517</b>
<i>Address</i>	: FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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<i>Telephone</i>	: +852 22421020	<i>Telephone</i>	: +852 2610 1044		
<i>Facsimile</i>	: +852 27143612	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PACIFIC LIGHT CABLE NETWORK (PLCN) - DEEP WATER BAY	<i>Quote number</i>	: HKE/1254/2018	<i>Date received</i>	: 05-Feb-2018
<i>Order number</i>	: —			<i>Date of issue</i>	: 07-Feb-2018
<i>C-O-C number</i>	: —			<i>No. of samples</i>	- Received : 96
<i>Site</i>	: —				- Analysed : 96

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

<u>Signatory</u>	<u>Position</u>	<u>Authorised results for:</u>
Fung Lim Chee, Richard	General Manager	Inorganics



### **Report Comments**

This report for ALS Technichem (HK) Pty Ltd work order reference HK1815517 supersedes any previous reports with this reference. Testing period is from 05-Feb-2018 to 07-Feb-2018. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

#### **Specific Comments for Work Order HK1815517 :**

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.

---



**Analytical Results**

Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
E1/S/1 MID-EBB	05-Feb-2018	HK1815517-001	3.0	---	---	---	---	---
E1/S/2 MID-EBB	05-Feb-2018	HK1815517-002	2.5	---	---	---	---	---
E1/M/1 MID-EBB	05-Feb-2018	HK1815517-003	4.5	---	---	---	---	---
E1/M/2 MID-EBB	05-Feb-2018	HK1815517-004	4.8	---	---	---	---	---
E1/B/1 MID-EBB	05-Feb-2018	HK1815517-005	5.6	---	---	---	---	---
E1/B/2 MID-EBB	05-Feb-2018	HK1815517-006	4.9	---	---	---	---	---
G1/S/1 MID-EBB	05-Feb-2018	HK1815517-007	4.3	---	---	---	---	---
G1/S/2 MID-EBB	05-Feb-2018	HK1815517-008	2.7	---	---	---	---	---
G1/M/1 MID-EBB	05-Feb-2018	HK1815517-009	3.3	---	---	---	---	---
G1/M/2 MID-EBB	05-Feb-2018	HK1815517-010	3.1	---	---	---	---	---
G1/B/1 MID-EBB	05-Feb-2018	HK1815517-011	5.3	---	---	---	---	---
G1/B/2 MID-EBB	05-Feb-2018	HK1815517-012	4.8	---	---	---	---	---
I3/S/1 MID-EBB	05-Feb-2018	HK1815517-013	4.0	---	---	---	---	---
I3/S/2 MID-EBB	05-Feb-2018	HK1815517-014	3.9	---	---	---	---	---
I3/M/1 MID-EBB	05-Feb-2018	HK1815517-015	2.9	---	---	---	---	---
I3/M/2 MID-EBB	05-Feb-2018	HK1815517-016	3.7	---	---	---	---	---
I3/B/1 MID-EBB	05-Feb-2018	HK1815517-017	4.8	---	---	---	---	---
I3/B/2 MID-EBB	05-Feb-2018	HK1815517-018	6.7	---	---	---	---	---
I4/S/1 MID-EBB	05-Feb-2018	HK1815517-019	3.8	---	---	---	---	---
I4/S/2 MID-EBB	05-Feb-2018	HK1815517-020	4.3	---	---	---	---	---
I4/M/1 MID-EBB	05-Feb-2018	HK1815517-021	2.9	---	---	---	---	---
I4/M/2 MID-EBB	05-Feb-2018	HK1815517-022	2.7	---	---	---	---	---
I4/B/1 MID-EBB	05-Feb-2018	HK1815517-023	3.1	---	---	---	---	---
I4/B/2 MID-EBB	05-Feb-2018	HK1815517-024	2.6	---	---	---	---	---
B1/S/1 MID-EBB	05-Feb-2018	HK1815517-025	2.5	---	---	---	---	---
B1/S/2 MID-EBB	05-Feb-2018	HK1815517-026	3.2	---	---	---	---	---
B1/M/1 MID-EBB	05-Feb-2018	HK1815517-027	3.9	---	---	---	---	---
B1/M/2 MID-EBB	05-Feb-2018	HK1815517-028	3.2	---	---	---	---	---
B1/B/1 MID-EBB	05-Feb-2018	HK1815517-029	4.2	---	---	---	---	---
B1/B/2 MID-EBB	05-Feb-2018	HK1815517-030	3.4	---	---	---	---	---
F1/S/1 MID-EBB	05-Feb-2018	HK1815517-031	3.9	---	---	---	---	---



Sub-Matrix: MARINE WATER

			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
F1/S/2 MID-EBB	05-Feb-2018	HK1815517-032	2.8	---	---	---	---	---
F1/M/1 MID-EBB	05-Feb-2018	HK1815517-033	4.2	---	---	---	---	---
F1/M/2 MID-EBB	05-Feb-2018	HK1815517-034	4.0	---	---	---	---	---
F1/B/1 MID-EBB	05-Feb-2018	HK1815517-035	3.3	---	---	---	---	---
F1/B/2 MID-EBB	05-Feb-2018	HK1815517-036	3.7	---	---	---	---	---
C2/S/1 MID-EBB	05-Feb-2018	HK1815517-037	4.0	---	---	---	---	---
C2/S/2 MID-EBB	05-Feb-2018	HK1815517-038	4.5	---	---	---	---	---
C2/M/1 MID-EBB	05-Feb-2018	HK1815517-039	4.8	---	---	---	---	---
C2/M/2 MID-EBB	05-Feb-2018	HK1815517-040	3.8	---	---	---	---	---
C2/B/1 MID-EBB	05-Feb-2018	HK1815517-041	4.9	---	---	---	---	---
C2/B/2 MID-EBB	05-Feb-2018	HK1815517-042	5.0	---	---	---	---	---
C3/S/1 MID-EBB	05-Feb-2018	HK1815517-043	6.7	---	---	---	---	---
C3/S/2 MID-EBB	05-Feb-2018	HK1815517-044	5.4	---	---	---	---	---
C3/M/1 MID-EBB	05-Feb-2018	HK1815517-045	5.3	---	---	---	---	---
C3/M/2 MID-EBB	05-Feb-2018	HK1815517-046	5.8	---	---	---	---	---
C3/B/1 MID-EBB	05-Feb-2018	HK1815517-047	5.9	---	---	---	---	---
C3/B/2 MID-EBB	05-Feb-2018	HK1815517-048	6.8	---	---	---	---	---
E1/S/1 MID-FLOOD	05-Feb-2018	HK1815517-049	4.5	---	---	---	---	---
E1/S/2 MID-FLOOD	05-Feb-2018	HK1815517-050	4.6	---	---	---	---	---
E1/M/1 MID-FLOOD	05-Feb-2018	HK1815517-051	3.7	---	---	---	---	---
E1/M/2 MID-FLOOD	05-Feb-2018	HK1815517-052	4.9	---	---	---	---	---
E1/B/1 MID-FLOOD	05-Feb-2018	HK1815517-053	4.2	---	---	---	---	---
E1/B/2 MID-FLOOD	05-Feb-2018	HK1815517-054	5.9	---	---	---	---	---
G1/S/1 MID-FLOOD	05-Feb-2018	HK1815517-055	3.4	---	---	---	---	---
G1/S/2 MID-FLOOD	05-Feb-2018	HK1815517-056	3.5	---	---	---	---	---
G1/M/1 MID-FLOOD	05-Feb-2018	HK1815517-057	4.3	---	---	---	---	---
G1/M/2 MID-FLOOD	05-Feb-2018	HK1815517-058	4.8	---	---	---	---	---
G1/B/1 MID-FLOOD	05-Feb-2018	HK1815517-059	3.5	---	---	---	---	---
G1/B/2 MID-FLOOD	05-Feb-2018	HK1815517-060	3.5	---	---	---	---	---
I3/S/1 MID-FLOOD	05-Feb-2018	HK1815517-061	5.4	---	---	---	---	---
I3/S/2 MID-FLOOD	05-Feb-2018	HK1815517-062	5.5	---	---	---	---	---
I3/M/1 MID-FLOOD	05-Feb-2018	HK1815517-063	4.2	---	---	---	---	---
I3/M/2 MID-FLOOD	05-Feb-2018	HK1815517-064	5.4	---	---	---	---	---





Sub-Matrix: MARINE WATER

Client sample ID	Client sampling date / time	Laboratory sample ID	Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
			EA/ED: Physical and Aggregate Properties	---	---	---	---	---
I3/B/1 MID-FLOOD	05-Feb-2018	HK1815517-065	8.1	---	---	---	---	---
I3/B/2 MID-FLOOD	05-Feb-2018	HK1815517-066	6.6	---	---	---	---	---
I4/S/1 MID-FLOOD	05-Feb-2018	HK1815517-067	4.8	---	---	---	---	---
I4/S/2 MID-FLOOD	05-Feb-2018	HK1815517-068	4.8	---	---	---	---	---
I4/M/1 MID-FLOOD	05-Feb-2018	HK1815517-069	6.4	---	---	---	---	---
I4/M/2 MID-FLOOD	05-Feb-2018	HK1815517-070	6.6	---	---	---	---	---
I4/B/1 MID-FLOOD	05-Feb-2018	HK1815517-071	5.5	---	---	---	---	---
I4/B/2 MID-FLOOD	05-Feb-2018	HK1815517-072	5.1	---	---	---	---	---
B1/S/1 MID-FLOOD	05-Feb-2018	HK1815517-073	4.7	---	---	---	---	---
B1/S/2 MID-FLOOD	05-Feb-2018	HK1815517-074	3.4	---	---	---	---	---
B1/M/1 MID-FLOOD	05-Feb-2018	HK1815517-075	5.3	---	---	---	---	---
B1/M/2 MID-FLOOD	05-Feb-2018	HK1815517-076	5.9	---	---	---	---	---
B1/B/1 MID-FLOOD	05-Feb-2018	HK1815517-077	8.6	---	---	---	---	---
B1/B/2 MID-FLOOD	05-Feb-2018	HK1815517-078	7.2	---	---	---	---	---
F1/S/1 MID-FLOOD	05-Feb-2018	HK1815517-079	7.4	---	---	---	---	---
F1/S/2 MID-FLOOD	05-Feb-2018	HK1815517-080	7.0	---	---	---	---	---
F1/M/1 MID-FLOOD	05-Feb-2018	HK1815517-081	6.0	---	---	---	---	---
F1/M/2 MID-FLOOD	05-Feb-2018	HK1815517-082	7.0	---	---	---	---	---
F1/B/1 MID-FLOOD	05-Feb-2018	HK1815517-083	6.9	---	---	---	---	---
F1/B/2 MID-FLOOD	05-Feb-2018	HK1815517-084	5.9	---	---	---	---	---
C2/S/1 MID-FLOOD	05-Feb-2018	HK1815517-085	4.9	---	---	---	---	---
C2/S/2 MID-FLOOD	05-Feb-2018	HK1815517-086	4.4	---	---	---	---	---
C2/M/1 MID-FLOOD	05-Feb-2018	HK1815517-087	3.7	---	---	---	---	---
C2/M/2 MID-FLOOD	05-Feb-2018	HK1815517-088	4.4	---	---	---	---	---
C2/B/1 MID-FLOOD	05-Feb-2018	HK1815517-089	4.7	---	---	---	---	---
C2/B/2 MID-FLOOD	05-Feb-2018	HK1815517-090	5.3	---	---	---	---	---
C3/S/1 MID-FLOOD	05-Feb-2018	HK1815517-091	3.8	---	---	---	---	---
C3/S/2 MID-FLOOD	05-Feb-2018	HK1815517-092	3.2	---	---	---	---	---
C3/M/1 MID-FLOOD	05-Feb-2018	HK1815517-093	2.7	---	---	---	---	---
C3/M/2 MID-FLOOD	05-Feb-2018	HK1815517-094	2.4	---	---	---	---	---
C3/B/1 MID-FLOOD	05-Feb-2018	HK1815517-095	2.9	---	---	---	---	---
C3/B/2 MID-FLOOD	05-Feb-2018	HK1815517-096	3.8	---	---	---	---	---



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1413928)</b>								
HK1815517-001	E1/S/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.0	2.1	38.0
HK1815517-011	G1/B/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	5.3	4.2	22.0
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1413929)</b>								
HK1815517-021	I4/M/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.9	3.4	16.7
HK1815517-031	F1/S/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.9	4.2	9.23
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1413930)</b>								
HK1815517-041	C2/B/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.9	5.4	9.66
HK1815517-051	E1/M/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.7	4.3	14.3
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1413931)</b>								
HK1815517-061	I3/S/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	5.4	5.3	0.00
HK1815517-071	I4/B/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	5.5	5.6	0.00
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1413932)</b>								
HK1815517-081	F1/M/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.0	7.7	25.6
HK1815517-091	C3/S/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.8	4.0	2.56

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1413928)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	106	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1413929)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	109	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1413930)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	112	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1413931)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	112	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1413932)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	109	----	85	115	----	----

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



### CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENOVATIVE ENVIRONMENTAL SERVICE LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 6
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<i>Facsimile</i>	: +852 27143612	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PACIFIC LIGHT CABLE NETWORK (PLCN) - DEEP WATER BAY	<i>Quote number</i>	: HKE/1254/2018	<i>Date received</i>	: 07-Feb-2018
<i>Order number</i>	: —			<i>Date of issue</i>	: 12-Feb-2018
<i>C-O-C number</i>	: —			<i>No. of samples</i>	- Received : 96
<i>Site</i>	: —				- Analysed : 96

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This document has been signed by those names that appear on this report and are the authorised signatories.

<u>Signatory</u>	<u>Position</u>	<u>Authorised results for:</u>
Fung Lim Chee, Richard	General Manager	Inorganics



### **Report Comments**

This report for ALS Technichem (HK) Pty Ltd work order reference HK1815701 supersedes any previous reports with this reference. Testing period is from 07-Feb-2018 to 12-Feb-2018. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

#### **Specific Comments for Work Order HK1815701 :**

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.

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**Analytical Results**

Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
E1/S/1 MID-EBB	07-Feb-2018	HK1815701-001	4.6	---	---	---	---	---
E1/S/2 MID-EBB	07-Feb-2018	HK1815701-002	3.3	---	---	---	---	---
E1/M/1 MID-EBB	07-Feb-2018	HK1815701-003	4.1	---	---	---	---	---
E1/M/2 MID-EBB	07-Feb-2018	HK1815701-004	3.9	---	---	---	---	---
E1/B/1 MID-EBB	07-Feb-2018	HK1815701-005	6.3	---	---	---	---	---
E1/B/2 MID-EBB	07-Feb-2018	HK1815701-006	4.8	---	---	---	---	---
G1/S/1 MID-EBB	07-Feb-2018	HK1815701-007	5.4	---	---	---	---	---
G1/S/2 MID-EBB	07-Feb-2018	HK1815701-008	4.8	---	---	---	---	---
G1/M/1 MID-EBB	07-Feb-2018	HK1815701-009	4.1	---	---	---	---	---
G1/M/2 MID-EBB	07-Feb-2018	HK1815701-010	4.7	---	---	---	---	---
G1/B/1 MID-EBB	07-Feb-2018	HK1815701-011	4.5	---	---	---	---	---
G1/B/2 MID-EBB	07-Feb-2018	HK1815701-012	4.8	---	---	---	---	---
I3/S/1 MID-EBB	07-Feb-2018	HK1815701-013	5.4	---	---	---	---	---
I3/S/2 MID-EBB	07-Feb-2018	HK1815701-014	5.1	---	---	---	---	---
I3/M/1 MID-EBB	07-Feb-2018	HK1815701-015	3.5	---	---	---	---	---
I3/M/2 MID-EBB	07-Feb-2018	HK1815701-016	3.9	---	---	---	---	---
I3/B/1 MID-EBB	07-Feb-2018	HK1815701-017	3.7	---	---	---	---	---
I3/B/2 MID-EBB	07-Feb-2018	HK1815701-018	4.4	---	---	---	---	---
I4/S/1 MID-EBB	07-Feb-2018	HK1815701-019	3.3	---	---	---	---	---
I4/S/2 MID-EBB	07-Feb-2018	HK1815701-020	4.9	---	---	---	---	---
I4/M/1 MID-EBB	07-Feb-2018	HK1815701-021	6.2	---	---	---	---	---
I4/M/2 MID-EBB	07-Feb-2018	HK1815701-022	6.3	---	---	---	---	---
I4/B/1 MID-EBB	07-Feb-2018	HK1815701-023	8.5	---	---	---	---	---
I4/B/2 MID-EBB	07-Feb-2018	HK1815701-024	9.1	---	---	---	---	---
B1/S/1 MID-EBB	07-Feb-2018	HK1815701-025	4.8	---	---	---	---	---
B1/S/2 MID-EBB	07-Feb-2018	HK1815701-026	4.7	---	---	---	---	---
B1/M/1 MID-EBB	07-Feb-2018	HK1815701-027	5.5	---	---	---	---	---
B1/M/2 MID-EBB	07-Feb-2018	HK1815701-028	4.0	---	---	---	---	---
B1/B/1 MID-EBB	07-Feb-2018	HK1815701-029	4.3	---	---	---	---	---
B1/B/2 MID-EBB	07-Feb-2018	HK1815701-030	5.8	---	---	---	---	---
F1/S/1 MID-EBB	07-Feb-2018	HK1815701-031	3.4	---	---	---	---	---



Sub-Matrix: MARINE WATER

Client sample ID	Client sampling date / time	Laboratory sample ID	Compound	---	---	---	---
			EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	---	---	---	---
			0.5 mg/L	---	---	---	---
			EA/ED: Physical and Aggregate Properties	---	---	---	---
F1/S/2 MID-EBB	07-Feb-2018	HK1815701-032	3.4	---	---	---	---
F1/M/1 MID-EBB	07-Feb-2018	HK1815701-033	3.5	---	---	---	---
F1/M/2 MID-EBB	07-Feb-2018	HK1815701-034	4.8	---	---	---	---
F1/B/1 MID-EBB	07-Feb-2018	HK1815701-035	5.0	---	---	---	---
F1/B/2 MID-EBB	07-Feb-2018	HK1815701-036	3.9	---	---	---	---
C2/S/1 MID-EBB	07-Feb-2018	HK1815701-037	4.8	---	---	---	---
C2/S/2 MID-EBB	07-Feb-2018	HK1815701-038	6.1	---	---	---	---
C2/M/1 MID-EBB	07-Feb-2018	HK1815701-039	6.5	---	---	---	---
C2/M/2 MID-EBB	07-Feb-2018	HK1815701-040	7.7	---	---	---	---
C2/B/1 MID-EBB	07-Feb-2018	HK1815701-041	6.1	---	---	---	---
C2/B/2 MID-EBB	07-Feb-2018	HK1815701-042	6.2	---	---	---	---
C3/S/1 MID-EBB	07-Feb-2018	HK1815701-043	3.4	---	---	---	---
C3/S/2 MID-EBB	07-Feb-2018	HK1815701-044	4.9	---	---	---	---
C3/M/1 MID-EBB	07-Feb-2018	HK1815701-045	4.2	---	---	---	---
C3/M/2 MID-EBB	07-Feb-2018	HK1815701-046	4.5	---	---	---	---
C3/B/1 MID-EBB	07-Feb-2018	HK1815701-047	8.6	---	---	---	---
C3/B/2 MID-EBB	07-Feb-2018	HK1815701-048	7.2	---	---	---	---
E1/S/1 MID-FLOOD	07-Feb-2018	HK1815701-049	5.0	---	---	---	---
E1/S/2 MID-FLOOD	07-Feb-2018	HK1815701-050	4.0	---	---	---	---
E1/M/1 MID-FLOOD	07-Feb-2018	HK1815701-051	3.5	---	---	---	---
E1/M/2 MID-FLOOD	07-Feb-2018	HK1815701-052	5.3	---	---	---	---
E1/B/1 MID-FLOOD	07-Feb-2018	HK1815701-053	4.3	---	---	---	---
E1/B/2 MID-FLOOD	07-Feb-2018	HK1815701-054	5.6	---	---	---	---
G1/S/1 MID-FLOOD	07-Feb-2018	HK1815701-055	4.3	---	---	---	---
G1/S/2 MID-FLOOD	07-Feb-2018	HK1815701-056	5.5	---	---	---	---
G1/M/1 MID-FLOOD	07-Feb-2018	HK1815701-057	8.8	---	---	---	---
G1/M/2 MID-FLOOD	07-Feb-2018	HK1815701-058	8.6	---	---	---	---
G1/B/1 MID-FLOOD	07-Feb-2018	HK1815701-059	7.8	---	---	---	---
G1/B/2 MID-FLOOD	07-Feb-2018	HK1815701-060	7.0	---	---	---	---
I3/S/1 MID-FLOOD	07-Feb-2018	HK1815701-061	4.8	---	---	---	---
I3/S/2 MID-FLOOD	07-Feb-2018	HK1815701-062	4.2	---	---	---	---
I3/M/1 MID-FLOOD	07-Feb-2018	HK1815701-063	5.1	---	---	---	---
I3/M/2 MID-FLOOD	07-Feb-2018	HK1815701-064	4.1	---	---	---	---



Sub-Matrix: MARINE WATER

			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
I3/B/1 MID-FLOOD	07-Feb-2018	HK1815701-065	7.4	---	---	---	---	---
I3/B/2 MID-FLOOD	07-Feb-2018	HK1815701-066	6.8	---	---	---	---	---
I4/S/1 MID-FLOOD	07-Feb-2018	HK1815701-067	7.1	---	---	---	---	---
I4/S/2 MID-FLOOD	07-Feb-2018	HK1815701-068	7.1	---	---	---	---	---
I4/M/1 MID-FLOOD	07-Feb-2018	HK1815701-069	5.8	---	---	---	---	---
I4/M/2 MID-FLOOD	07-Feb-2018	HK1815701-070	6.7	---	---	---	---	---
I4/B/1 MID-FLOOD	07-Feb-2018	HK1815701-071	8.3	---	---	---	---	---
I4/B/2 MID-FLOOD	07-Feb-2018	HK1815701-072	8.6	---	---	---	---	---
B1/S/1 MID-FLOOD	07-Feb-2018	HK1815701-073	5.1	---	---	---	---	---
B1/S/2 MID-FLOOD	07-Feb-2018	HK1815701-074	4.1	---	---	---	---	---
B1/M/1 MID-FLOOD	07-Feb-2018	HK1815701-075	5.9	---	---	---	---	---
B1/M/2 MID-FLOOD	07-Feb-2018	HK1815701-076	4.6	---	---	---	---	---
B1/B/1 MID-FLOOD	07-Feb-2018	HK1815701-077	6.7	---	---	---	---	---
B1/B/2 MID-FLOOD	07-Feb-2018	HK1815701-078	7.4	---	---	---	---	---
F1/S/1 MID-FLOOD	07-Feb-2018	HK1815701-079	5.4	---	---	---	---	---
F1/S/2 MID-FLOOD	07-Feb-2018	HK1815701-080	4.5	---	---	---	---	---
F1/M/1 MID-FLOOD	07-Feb-2018	HK1815701-081	6.5	---	---	---	---	---
F1/M/2 MID-FLOOD	07-Feb-2018	HK1815701-082	6.1	---	---	---	---	---
F1/B/1 MID-FLOOD	07-Feb-2018	HK1815701-083	5.6	---	---	---	---	---
F1/B/2 MID-FLOOD	07-Feb-2018	HK1815701-084	6.2	---	---	---	---	---
C2/S/1 MID-FLOOD	07-Feb-2018	HK1815701-085	3.1	---	---	---	---	---
C2/S/2 MID-FLOOD	07-Feb-2018	HK1815701-086	5.4	---	---	---	---	---
C2/M/1 MID-FLOOD	07-Feb-2018	HK1815701-087	4.7	---	---	---	---	---
C2/M/2 MID-FLOOD	07-Feb-2018	HK1815701-088	4.0	---	---	---	---	---
C2/B/1 MID-FLOOD	07-Feb-2018	HK1815701-089	7.3	---	---	---	---	---
C2/B/2 MID-FLOOD	07-Feb-2018	HK1815701-090	6.3	---	---	---	---	---
C3/S/1 MID-FLOOD	07-Feb-2018	HK1815701-091	4.6	---	---	---	---	---
C3/S/2 MID-FLOOD	07-Feb-2018	HK1815701-092	4.2	---	---	---	---	---
C3/M/1 MID-FLOOD	07-Feb-2018	HK1815701-093	5.0	---	---	---	---	---
C3/M/2 MID-FLOOD	07-Feb-2018	HK1815701-094	4.7	---	---	---	---	---
C3/B/1 MID-FLOOD	07-Feb-2018	HK1815701-095	4.8	---	---	---	---	---
C3/B/2 MID-FLOOD	07-Feb-2018	HK1815701-096	4.0	---	---	---	---	---



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1423328)</b>								
HK1815701-001	E1/S/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.6	3.0	40.8
HK1815701-011	G1/B/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.5	5.5	20.6
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1423329)</b>								
HK1815701-021	I4/M/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.2	7.3	16.7
HK1815701-031	F1/S/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.4	4.5	27.7
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1423330)</b>								
HK1815701-041	C2/B/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.1	6.4	4.00
HK1815701-051	E1/M/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	3.5	4.8	30.1
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1423331)</b>								
HK1815701-061	I3/S/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.8	5.4	13.2
HK1815701-071	I4/B/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	8.3	7.9	5.56
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1423332)</b>								
HK1815701-081	F1/M/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.5	6.3	3.51
HK1815701-091	C3/S/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.6	3.9	18.2

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1423328)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	106	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1423329)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	109	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1423330)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	108	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1423331)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	98.5	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1423332)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	112	----	85	115	----	----

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.





### CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENOVATIVE ENVIRONMENTAL SERVICE LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 6
<i>Contact</i>	: MR THOMAS WONG	<i>Contact</i>	: Richard Fung	<i>Work Order</i>	: <b>HK1815702</b>
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<i>Telephone</i>	: ----	<i>Telephone</i>	: +852 2610 1044		
<i>Facsimile</i>	: ----	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PACIFIC LIGHT CABLE NETWORK (PLCN) - DEEP WATER BAY	<i>Quote number</i>	: HKE/1254/2018	<i>Date received</i>	: 09-Feb-2018
<i>Order number</i>	: —			<i>Date of issue</i>	: 13-Feb-2018
<i>C-O-C number</i>	: —			<i>No. of samples</i>	- <i>Received</i> : 96
<i>Site</i>	: —				- <i>Analysed</i> : 96

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This document has been signed by those names that appear on this report and are the authorised signatories.

<u>Signatory</u>	<u>Position</u>	<u>Authorised results for:</u>
Fung Lim Chee, Richard	General Manager	Inorganics



### **Report Comments**

This report for ALS Technichem (HK) Pty Ltd work order reference HK1815702 supersedes any previous reports with this reference. Testing period is from 09-Feb-2018 to 13-Feb-2018. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

#### **Specific Comments for Work Order HK1815702 :**

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.

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**Analytical Results**

Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
E1/S/1 MID-EBB	09-Feb-2018	HK1815702-001	6.0	---	---	---	---	---
E1/S/2 MID-EBB	09-Feb-2018	HK1815702-002	7.5	---	---	---	---	---
E1/M/1 MID-EBB	09-Feb-2018	HK1815702-003	7.5	---	---	---	---	---
E1/M/2 MID-EBB	09-Feb-2018	HK1815702-004	8.1	---	---	---	---	---
E1/B/1 MID-EBB	09-Feb-2018	HK1815702-005	7.0	---	---	---	---	---
E1/B/2 MID-EBB	09-Feb-2018	HK1815702-006	6.9	---	---	---	---	---
G1/S/1 MID-EBB	09-Feb-2018	HK1815702-007	8.2	---	---	---	---	---
G1/S/2 MID-EBB	09-Feb-2018	HK1815702-008	6.6	---	---	---	---	---
G1/M/1 MID-EBB	09-Feb-2018	HK1815702-009	6.1	---	---	---	---	---
G1/M/2 MID-EBB	09-Feb-2018	HK1815702-010	7.6	---	---	---	---	---
G1/B/1 MID-EBB	09-Feb-2018	HK1815702-011	6.6	---	---	---	---	---
G1/B/2 MID-EBB	09-Feb-2018	HK1815702-012	6.3	---	---	---	---	---
I3/S/1 MID-EBB	09-Feb-2018	HK1815702-013	3.8	---	---	---	---	---
I3/S/2 MID-EBB	09-Feb-2018	HK1815702-014	2.3	---	---	---	---	---
I3/M/1 MID-EBB	09-Feb-2018	HK1815702-015	4.4	---	---	---	---	---
I3/M/2 MID-EBB	09-Feb-2018	HK1815702-016	4.2	---	---	---	---	---
I3/B/1 MID-EBB	09-Feb-2018	HK1815702-017	3.8	---	---	---	---	---
I3/B/2 MID-EBB	09-Feb-2018	HK1815702-018	3.5	---	---	---	---	---
I4/S/1 MID-EBB	09-Feb-2018	HK1815702-019	3.7	---	---	---	---	---
I4/S/2 MID-EBB	09-Feb-2018	HK1815702-020	4.6	---	---	---	---	---
I4/M/1 MID-EBB	09-Feb-2018	HK1815702-021	4.7	---	---	---	---	---
I4/M/2 MID-EBB	09-Feb-2018	HK1815702-022	3.7	---	---	---	---	---
I4/B/1 MID-EBB	09-Feb-2018	HK1815702-023	8.5	---	---	---	---	---
I4/B/2 MID-EBB	09-Feb-2018	HK1815702-024	7.2	---	---	---	---	---
B1/S/1 MID-EBB	09-Feb-2018	HK1815702-025	5.2	---	---	---	---	---
B1/S/2 MID-EBB	09-Feb-2018	HK1815702-026	4.6	---	---	---	---	---
B1/M/1 MID-EBB	09-Feb-2018	HK1815702-027	7.2	---	---	---	---	---
B1/M/2 MID-EBB	09-Feb-2018	HK1815702-028	8.4	---	---	---	---	---
B1/B/1 MID-EBB	09-Feb-2018	HK1815702-029	8.4	---	---	---	---	---
B1/B/2 MID-EBB	09-Feb-2018	HK1815702-030	7.8	---	---	---	---	---
F1/S/1 MID-EBB	09-Feb-2018	HK1815702-031	2.8	---	---	---	---	---



Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
F1/S/2 MID-EBB	09-Feb-2018	HK1815702-032	3.4	---	---	---	---	---
F1/M/1 MID-EBB	09-Feb-2018	HK1815702-033	2.2	---	---	---	---	---
F1/M/2 MID-EBB	09-Feb-2018	HK1815702-034	2.1	---	---	---	---	---
F1/B/1 MID-EBB	09-Feb-2018	HK1815702-035	3.4	---	---	---	---	---
F1/B/2 MID-EBB	09-Feb-2018	HK1815702-036	2.5	---	---	---	---	---
C2/S/1 MID-EBB	09-Feb-2018	HK1815702-037	3.6	---	---	---	---	---
C2/S/2 MID-EBB	09-Feb-2018	HK1815702-038	5.0	---	---	---	---	---
C2/M/1 MID-EBB	09-Feb-2018	HK1815702-039	5.2	---	---	---	---	---
C2/M/2 MID-EBB	09-Feb-2018	HK1815702-040	4.3	---	---	---	---	---
C2/B/1 MID-EBB	09-Feb-2018	HK1815702-041	4.0	---	---	---	---	---
C2/B/2 MID-EBB	09-Feb-2018	HK1815702-042	3.4	---	---	---	---	---
C3/S/1 MID-EBB	09-Feb-2018	HK1815702-043	2.8	---	---	---	---	---
C3/S/2 MID-EBB	09-Feb-2018	HK1815702-044	2.8	---	---	---	---	---
C3/M/1 MID-EBB	09-Feb-2018	HK1815702-045	3.2	---	---	---	---	---
C3/M/2 MID-EBB	09-Feb-2018	HK1815702-046	3.8	---	---	---	---	---
C3/B/1 MID-EBB	09-Feb-2018	HK1815702-047	7.2	---	---	---	---	---
C3/B/2 MID-EBB	09-Feb-2018	HK1815702-048	7.9	---	---	---	---	---
E1/S/1 MID-FLOOD	09-Feb-2018	HK1815702-049	2.6	---	---	---	---	---
E1/S/2 MID-FLOOD	09-Feb-2018	HK1815702-050	3.8	---	---	---	---	---
E1/M/1 MID-FLOOD	09-Feb-2018	HK1815702-051	4.5	---	---	---	---	---
E1/M/2 MID-FLOOD	09-Feb-2018	HK1815702-052	5.5	---	---	---	---	---
E1/B/1 MID-FLOOD	09-Feb-2018	HK1815702-053	4.4	---	---	---	---	---
E1/B/2 MID-FLOOD	09-Feb-2018	HK1815702-054	5.3	---	---	---	---	---
G1/S/1 MID-FLOOD	09-Feb-2018	HK1815702-055	4.1	---	---	---	---	---
G1/S/2 MID-FLOOD	09-Feb-2018	HK1815702-056	3.8	---	---	---	---	---
G1/M/1 MID-FLOOD	09-Feb-2018	HK1815702-057	4.7	---	---	---	---	---
G1/M/2 MID-FLOOD	09-Feb-2018	HK1815702-058	3.1	---	---	---	---	---
G1/B/1 MID-FLOOD	09-Feb-2018	HK1815702-059	6.3	---	---	---	---	---
G1/B/2 MID-FLOOD	09-Feb-2018	HK1815702-060	5.0	---	---	---	---	---
I3/S/1 MID-FLOOD	09-Feb-2018	HK1815702-061	4.6	---	---	---	---	---
I3/S/2 MID-FLOOD	09-Feb-2018	HK1815702-062	4.5	---	---	---	---	---
I3/M/1 MID-FLOOD	09-Feb-2018	HK1815702-063	5.7	---	---	---	---	---
I3/M/2 MID-FLOOD	09-Feb-2018	HK1815702-064	4.9	---	---	---	---	---



Sub-Matrix: MARINE WATER			Compound	EA025: Suspended Solids (SS)	---	---	---	---
			LOR Unit	0.5 mg/L	---	---	---	---
Client sample ID	Client sampling date / time	Laboratory sample ID	EA/ED: Physical and Aggregate Properties	---	---	---	---	---
I3/B/1 MID-FLOOD	09-Feb-2018	HK1815702-065	4.9	---	---	---	---	---
I3/B/2 MID-FLOOD	09-Feb-2018	HK1815702-066	5.5	---	---	---	---	---
I4/S/1 MID-FLOOD	09-Feb-2018	HK1815702-067	2.4	---	---	---	---	---
I4/S/2 MID-FLOOD	09-Feb-2018	HK1815702-068	3.6	---	---	---	---	---
I4/M/1 MID-FLOOD	09-Feb-2018	HK1815702-069	5.4	---	---	---	---	---
I4/M/2 MID-FLOOD	09-Feb-2018	HK1815702-070	4.6	---	---	---	---	---
I4/B/1 MID-FLOOD	09-Feb-2018	HK1815702-071	5.8	---	---	---	---	---
I4/B/2 MID-FLOOD	09-Feb-2018	HK1815702-072	7.3	---	---	---	---	---
B1/S/1 MID-FLOOD	09-Feb-2018	HK1815702-073	3.5	---	---	---	---	---
B1/S/2 MID-FLOOD	09-Feb-2018	HK1815702-074	4.2	---	---	---	---	---
B1/M/1 MID-FLOOD	09-Feb-2018	HK1815702-075	3.0	---	---	---	---	---
B1/M/2 MID-FLOOD	09-Feb-2018	HK1815702-076	2.9	---	---	---	---	---
B1/B/1 MID-FLOOD	09-Feb-2018	HK1815702-077	8.1	---	---	---	---	---
B1/B/2 MID-FLOOD	09-Feb-2018	HK1815702-078	9.5	---	---	---	---	---
F1/S/1 MID-FLOOD	09-Feb-2018	HK1815702-079	2.9	---	---	---	---	---
F1/S/2 MID-FLOOD	09-Feb-2018	HK1815702-080	3.3	---	---	---	---	---
F1/M/1 MID-FLOOD	09-Feb-2018	HK1815702-081	2.3	---	---	---	---	---
F1/M/2 MID-FLOOD	09-Feb-2018	HK1815702-082	2.6	---	---	---	---	---
F1/B/1 MID-FLOOD	09-Feb-2018	HK1815702-083	3.2	---	---	---	---	---
F1/B/2 MID-FLOOD	09-Feb-2018	HK1815702-084	3.8	---	---	---	---	---
C2/S/1 MID-FLOOD	09-Feb-2018	HK1815702-085	3.4	---	---	---	---	---
C2/S/2 MID-FLOOD	09-Feb-2018	HK1815702-086	2.1	---	---	---	---	---
C2/M/1 MID-FLOOD	09-Feb-2018	HK1815702-087	4.7	---	---	---	---	---
C2/M/2 MID-FLOOD	09-Feb-2018	HK1815702-088	3.6	---	---	---	---	---
C2/B/1 MID-FLOOD	09-Feb-2018	HK1815702-089	3.9	---	---	---	---	---
C2/B/2 MID-FLOOD	09-Feb-2018	HK1815702-090	3.1	---	---	---	---	---
C3/S/1 MID-FLOOD	09-Feb-2018	HK1815702-091	2.2	---	---	---	---	---
C3/S/2 MID-FLOOD	09-Feb-2018	HK1815702-092	3.9	---	---	---	---	---
C3/M/1 MID-FLOOD	09-Feb-2018	HK1815702-093	3.0	---	---	---	---	---
C3/M/2 MID-FLOOD	09-Feb-2018	HK1815702-094	2.6	---	---	---	---	---
C3/B/1 MID-FLOOD	09-Feb-2018	HK1815702-095	4.1	---	---	---	---	---
C3/B/2 MID-FLOOD	09-Feb-2018	HK1815702-096	3.3	---	---	---	---	---



### Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1427256)</b>								
HK1815702-001	E1/S/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.0	6.9	12.8
HK1815702-011	G1/B/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.6	6.2	6.25
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1427257)</b>								
HK1815702-021	I4/M/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.7	3.6	27.7
HK1815702-031	F1/S/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.8	3.6	25.9
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1427258)</b>								
HK1815702-041	C2/B/1 MID-EBB	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.0	5.2	27.8
HK1815702-051	E1/M/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.5	5.9	26.0
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1427259)</b>								
HK1815702-061	I3/S/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.6	3.6	23.6
HK1815702-071	I4/B/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	5.8	6.1	5.02
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 1427260)</b>								
HK1815702-081	F1/M/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.3	2.6	15.2
HK1815702-091	C3/S/1 MID-FLOOD	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.2	2.6	17.4

### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1427256)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	110	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1427257)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	102	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1427258)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	110	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1427259)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	110	----	85	115	----	----
<b>EA/ED: Physical and Aggregate Properties (QCLot: 1427260)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	20 mg/L	108	----	85	115	----	----

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Annex D

## Baseline Water Quality Monitoring Results (Zone A)

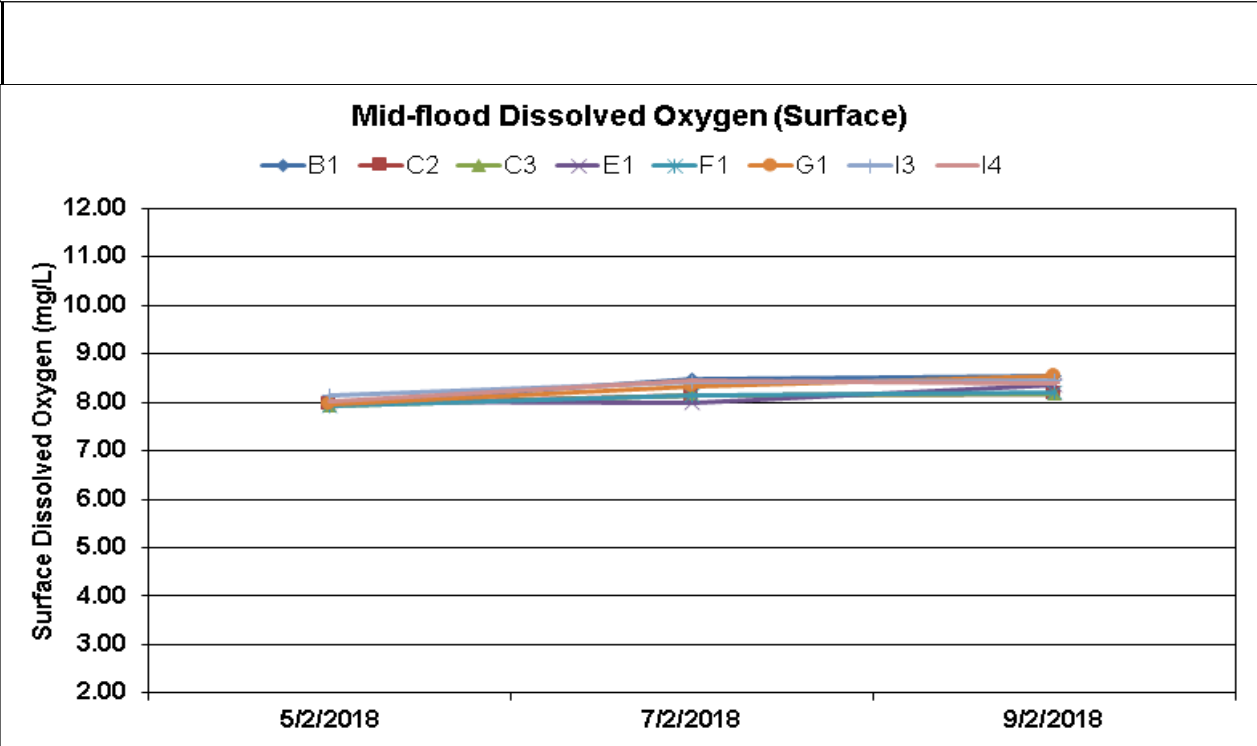
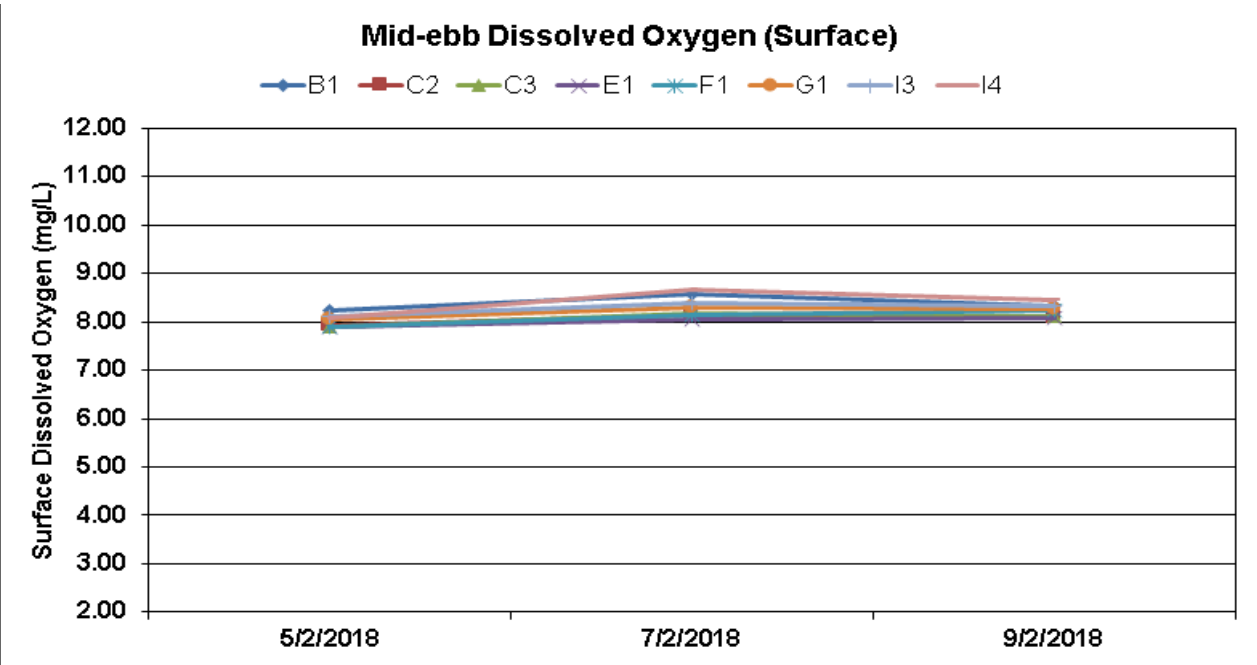


Figure D1 Dissolved oxygen (mg/L) at surface of water column measured during the baseline update monitoring period from 5 to 9 February 2018 for Zone A





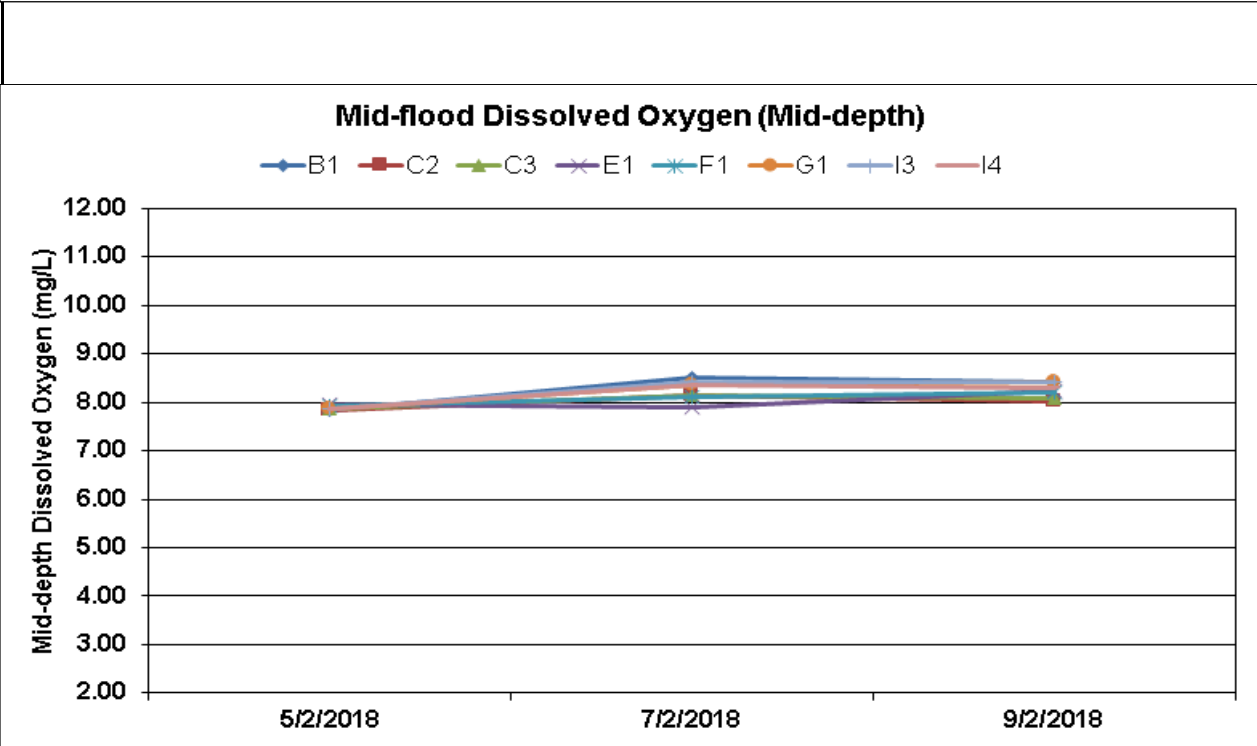
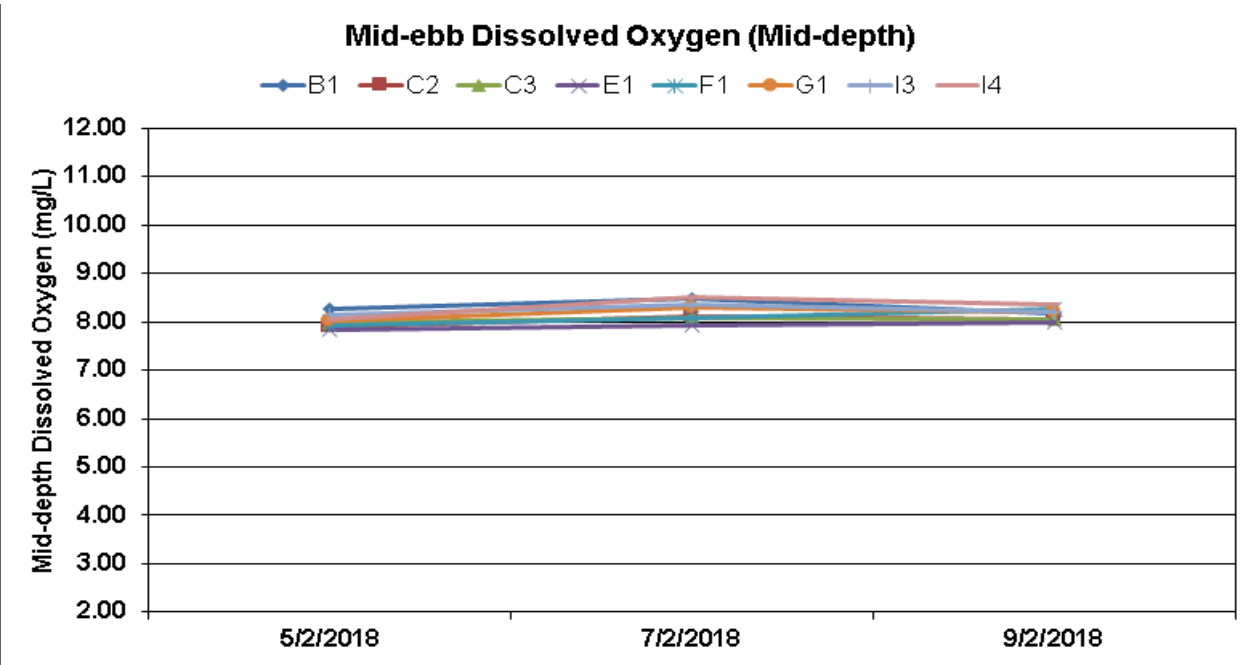


Figure D2 Dissolved oxygen (mg/L) at mid-depth of water column measured during the baseline update monitoring period from 5 to 9 February 2018 for Zone A



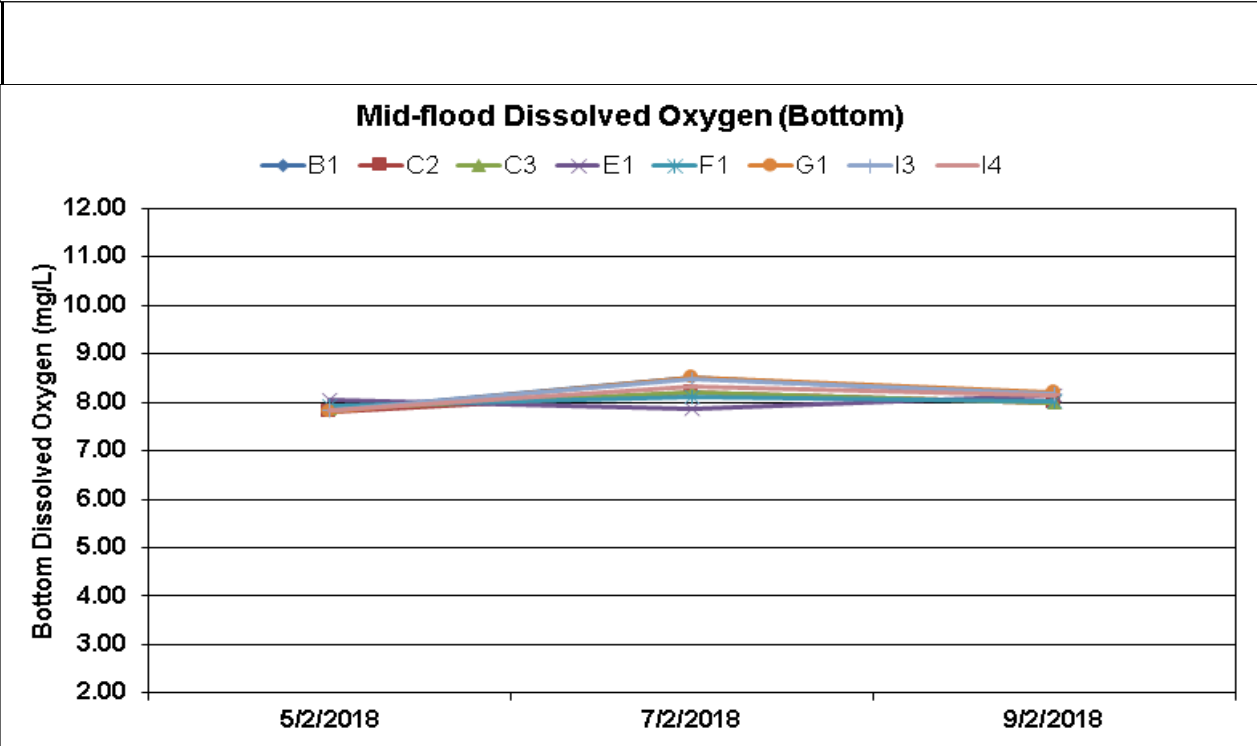
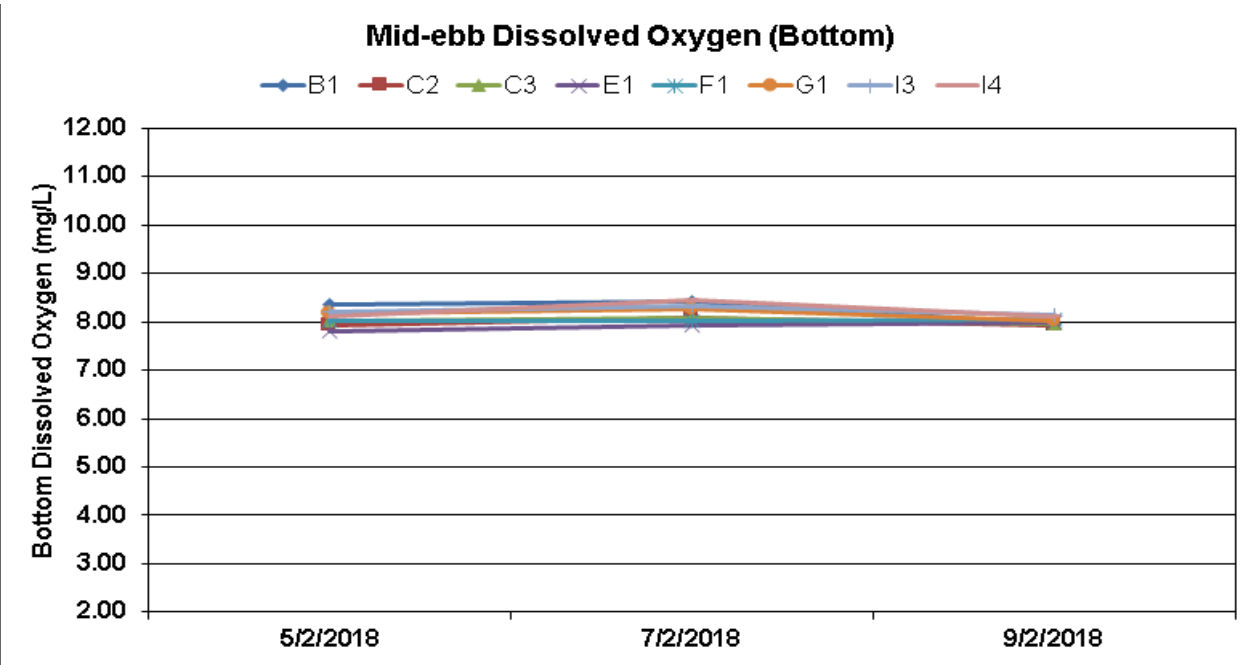


Figure D3 Dissolved oxygen (mg/L) at bottom of water column measured during the baseline update monitoring period from 5 to 9 February 2018 for Zone A



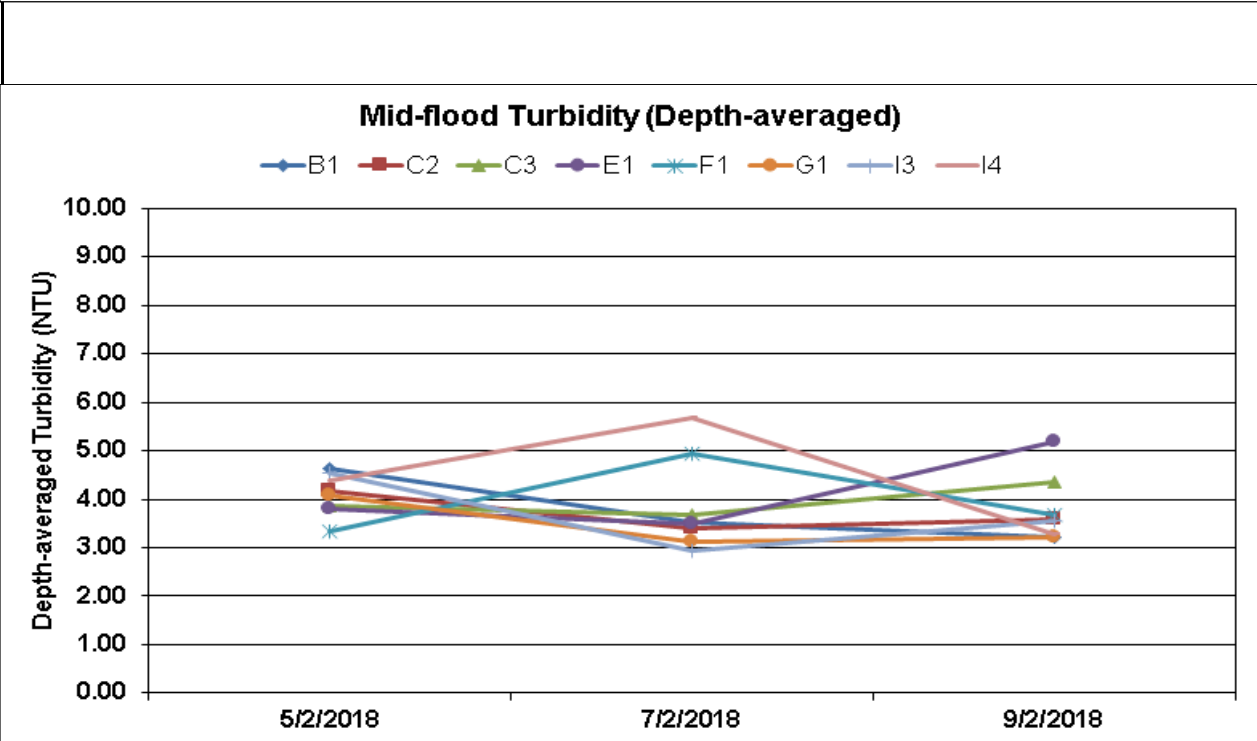
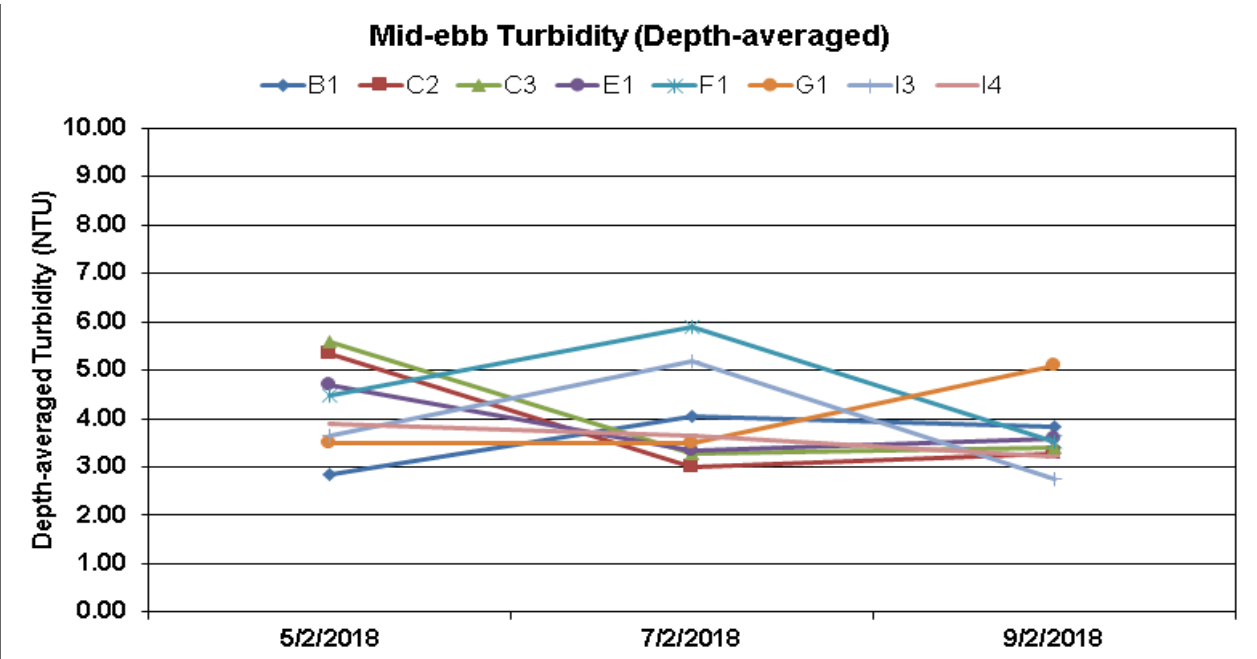
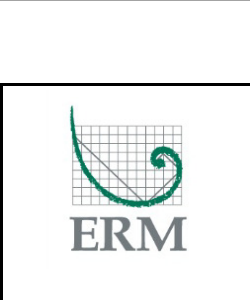


Figure D4 Depth-averaged turbidity (NTU) of water column measured during the baseline update monitoring period from 5 to 9 February 2018 for Zone A



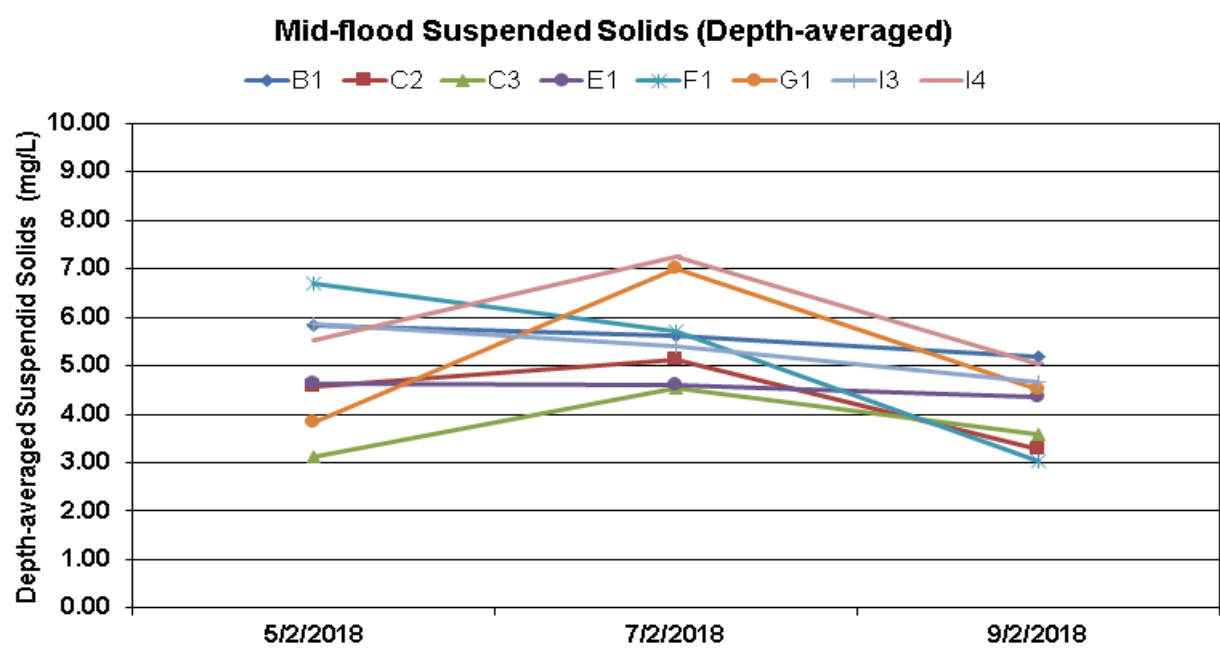
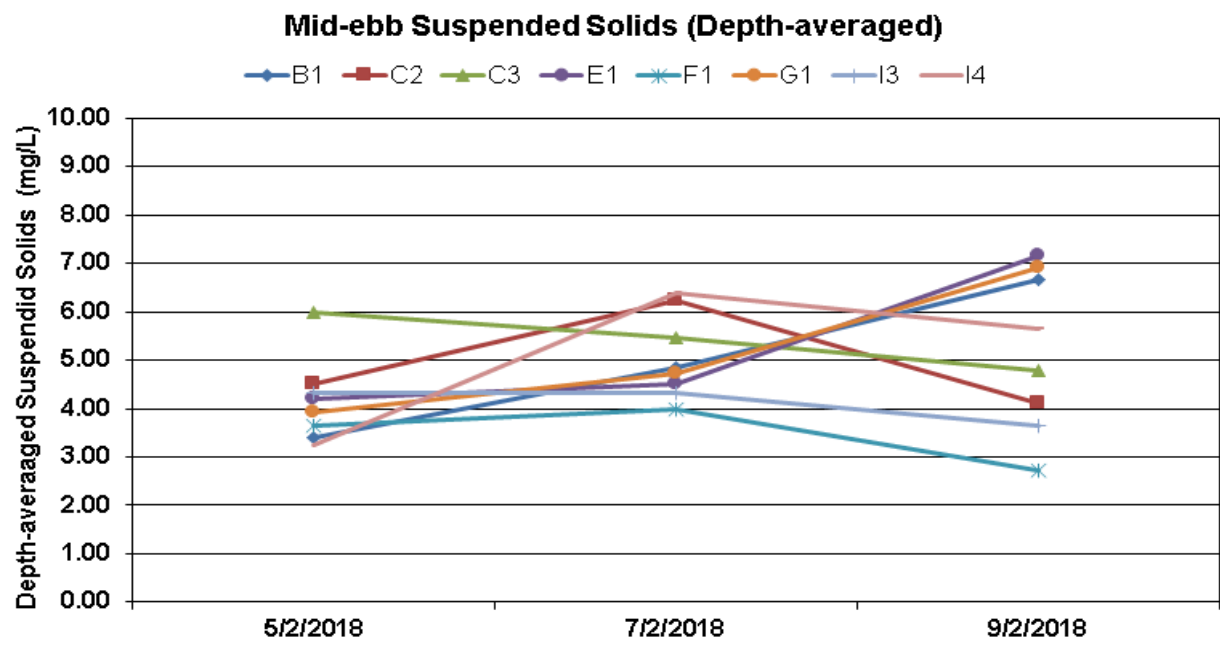


Figure D5 Depth-averaged suspended solid (mg/L) of water column measured during the baseline update monitoring period from 5 to 9 February 2018 for Zone A



Monitoring Date	Station	Depth + Replicate No.	Replicate	Tidal Level	Depth (m)	Water Temperature (° C)	Salinity (ppt)	D.O. (mg/L)	D.O. Saturation (%)	Turbidity (NTU)	pH	SS (mg/L)	D.O. (mg/L) Surface & Middle	D.O. (mg/L) Bottom	Turbidity (Depth-averaged) (NTU)	SS (Depth-averaged) (mg/L)
5/2/2018	E1	S1	R1	Mid-ebb	1.0	15.74	34.68	7.90	98.3	4.7	8.0	3.0	7.87		4.70	4.22
	E1	S2	R2	Mid-ebb		15.74	34.68	7.90	98.3	4.7	8.0	2.5				
	E1	M1	R1	Mid-ebb	18.6	15.71	34.70	7.84	97.6	4.4	8.0	4.5				
	E1	M2	R2	Mid-ebb		15.71	34.70	7.84	97.6	4.4	8.0	4.8				
	E1	B1	R1	Mid-ebb	36.1	15.65	34.75	7.81	97.1	5.0	8.0	5.6		7.81		
	E1	B2	R2	Mid-ebb		15.65	34.75	7.81	97.1	5.0	8.0	4.9				
	F1	S1	R1	Mid-ebb	1.0	15.77	35.69	7.91	99.2	4.3	8.0	3.9	7.92		4.47	3.65
	F1	S2	R2	Mid-ebb		15.77	35.69	7.91	99.2	4.3	8.0	2.8				
	F1	M1	R1	Mid-ebb	8.2	15.73	35.68	7.92	99.2	4.4	8.0	4.2				
	F1	M2	R2	Mid-ebb		15.73	35.68	7.92	99.2	4.4	8.0	4.0				
	F1	B1	R1	Mid-ebb	15.3	15.72	35.67	8.01	100.2	4.7	8.0	3.3		8.01		
	F1	B2	R2	Mid-ebb		15.72	35.67	8.01	100.2	4.7	8.0	3.7				
	B1	S1	R1	Mid-ebb	1.0	15.54	34.80	8.25	102.4	2.6	8.0	2.5	8.27		2.83	3.40
	B1	S2	R2	Mid-ebb		15.54	34.80	8.25	102.4	2.6	8.0	3.2				
	B1	M1	R1	Mid-ebb	3.6	15.51	34.87	8.28	102.7	2.7	8.0	3.9				
	B1	M2	R2	Mid-ebb		15.51	34.87	8.28	102.7	2.7	8.0	3.2				
	B1	B1	R1	Mid-ebb	6.2	15.48	34.83	8.35	103.5	3.2	8.0	4.2		8.35		
	B1	B2	R2	Mid-ebb		15.48	34.83	8.35	103.5	3.2	8.0	3.4				
	C2	S1	R1	Mid-ebb	1.0	15.75	34.53	7.94	98.8	4.4	8.0	4.0	7.92		5.33	4.50
	C2	S2	R2	Mid-ebb		15.75	34.53	7.94	98.8	4.4	8.0	4.5				
	C2	M1	R1	Mid-ebb	9.6	15.73	34.57	7.90	98.2	5.1	8.0	4.8				
	C2	M2	R2	Mid-ebb		15.73	34.57	7.90	98.2	5.1	8.0	3.8				
	C2	B1	R1	Mid-ebb	18.2	15.72	34.60	7.92	98.5	6.5	8.0	4.9		7.92		
	C2	B2	R2	Mid-ebb		15.72	34.60	7.92	98.5	6.5	8.0	5.0				
	C3	S1	R1	Mid-ebb	1.0	15.65	35.27	7.90	98.5	5.6	8.0	6.7	7.94		5.60	5.98
	C3	S2	R2	Mid-ebb		15.65	35.27	7.90	98.5	5.6	8.0	5.4				
	C3	M1	R1	Mid-ebb	9.7	15.67	33.80	7.98	98.7	5.4	8.0	5.3				
	C3	M2	R2	Mid-ebb		15.67	33.80	7.98	98.7	5.4	8.0	5.8				
	C3	B1	R1	Mid-ebb	18.4	15.66	33.90	8.01	99.0	5.8	8.0	5.9		8.01		
	C3	B2	R2	Mid-ebb		15.66	33.90	8.01	99.1	5.8	8.0	6.8				
	I3	S1	R1	Mid-ebb	1.0	15.72	34.80	8.10	100.8	3.1	8.0	4.0	8.12		3.63	4.33
	I3	S2	R2	Mid-ebb		15.72	34.80	8.10	100.8	3.1	8.0	3.9				
	I3	M1	R1	Mid-ebb	5.5	15.68	34.82	8.14	101.3	3.5	8.0	2.9				
	I3	M2	R2	Mid-ebb		15.68	34.82	8.14	101.3	3.5	8.0	3.7				
	I3	B1	R1	Mid-ebb	10.0	15.66	34.81	8.22	102.2	4.3	8.0	4.8		8.22		
	I3	B2	R2	Mid-ebb		15.66	34.81	8.22	102.2	4.3	8.0	6.7				
	I4	S1	R1	Mid-ebb	1.0	15.64	34.78	8.08	100.4	3.2	8.0	3.8	8.07		3.90	3.23
	I4	S2	R2	Mid-ebb		15.64	34.78	8.08	100.4	3.2	8.0	4.3				
	I4	M1	R1	Mid-ebb	5.0	15.56	34.80	8.06	100.0	4.0	8.0	2.9				
	I4	M2	R2	Mid-ebb		15.56	34.80	8.06	100.0	4.0	8.0	2.7				
	I4	B1	R1	Mid-ebb	8.9	15.49	34.80	8.11	100.5	4.5	8.0	3.1		8.11		
	I4	B2	R2	Mid-ebb		15.49	34.80	8.11	100.5	4.5	8.0	2.6				
	G1	S1	R1	Mid-ebb	1.0	15.73	34.28	8.04	99.8	3.3	8.0	4.3	8.03		3.50	3.92
	G1	S2	R2	Mid-ebb		15.73	34.28	8.04	99.8	3.3	8.0	2.7				
	G1	M1	R1	Mid-ebb	5.6	15.71	34.27	8.01	99.4	3.5	8.0	3.3				
	G1	M2	R2	Mid-ebb		15.71	34.27	8.01	99.4	3.5	8.0	3.1				
	G1	B1	R1	Mid-ebb	10.2	15.70	34.26	8.16	101.2	3.7	8.0	5.3		8.16		
	G1	B2	R2	Mid-ebb		15.70	34.26	8.16	101.2	3.7	8.0	4.8				

Monitoring Date	Station	Depth + Replicate No.	Replicate	Tidal Level	Depth (m)	Water Temperature (° C)	Salinity (ppt)	D.O. (mg/L)	D.O. Saturation (%)	Turbidity (NTU)	pH	SS (mg/L)	D.O. (mg/L) Surface & Middle	D.O. (mg/L) Bottom	Turbidity (Depth-averaged) (NTU)	SS (Depth-averaged) (mg/L)
5/2/2018	E1	S1	R1	Mid-flood	1.0	15.25	35.58	8.01	99.2	3.6	7.9	4.5	7.98		3.80	4.63
	E1	S2	R2	Mid-flood		15.25	35.58	8.01	99.2	3.6	7.9	4.6				
	E1	M1	R1	Mid-flood	18.1	15.27	35.58	7.95	98.6	3.8	7.9	3.7				
	E1	M2	R2	Mid-flood		15.27	35.58	7.95	98.6	3.8	7.9	4.9				
	E1	B1	R1	Mid-flood	35.2	15.28	35.58	8.04	99.7	4.0	7.9	4.2		8.04		
	E1	B2	R2	Mid-flood		15.28	35.58	8.04	99.7	4.0	7.9	5.9				
	F1	S1	R1	Mid-flood	1.0	15.34	35.03	7.94	98.3	3.1	8.0	7.4	7.93		3.33	6.70
	F1	S2	R2	Mid-flood		15.34	35.03	7.94	98.3	3.1	8.0	7.0				
	F1	M1	R1	Mid-flood	7.8	15.35	35.04	7.92	98.0	3.3	8.0	6.0				
	F1	M2	R2	Mid-flood		15.35	35.04	7.92	98.0	3.3	8.0	7.0				
	F1	B1	R1	Mid-flood	14.5	15.38	35.06	7.92	98.1	3.6	8.0	6.9		7.92		
	F1	B2	R2	Mid-flood		15.38	35.06	7.92	98.1	3.6	8.0	5.9				
	B1	S1	R1	Mid-flood	1.0	15.08	35.00	7.96	98.0	4.3	8.0	4.7	7.90		4.63	5.85
	B1	S2	R2	Mid-flood		15.08	35.00	7.96	98.0	4.3	8.0	3.4				
	B1	M1	R1	Mid-flood	3.8	15.17	35.00	7.84	96.7	5.1	8.0	5.3				
	B1	M2	R2	Mid-flood		15.17	35.00	7.84	96.7	5.1	8.0	5.9				
	B1	B1	R1	Mid-flood	6.5	15.18	35.03	7.84	96.7	4.5	8.0	8.6		7.84		
	B1	B2	R2	Mid-flood		15.18	35.03	7.84	96.7	4.5	8.0	7.2				
	C2	S1	R1	Mid-flood	1.0	15.17	35.09	7.95	98.1	3.7	8.0	4.9	7.90		4.17	4.57
	C2	S2	R2	Mid-flood		15.17	35.10	7.96	98.2	3.7	8.0	4.4				
	C2	M1	R1	Mid-flood	9.8	15.15	35.05	7.85	96.8	3.9	8.0	3.7				
	C2	M2	R2	Mid-flood		15.15	35.05	7.85	96.8	3.9	8.0	4.4				
	C2	B1	R1	Mid-flood	18.6	15.13	35.05	7.80	96.1	4.9	8.0	4.7		7.80		
	C2	B2	R2	Mid-flood		15.13	35.05	7.80	96.1	4.9	8.0	5.3				
	C3	S1	R1	Mid-flood	1.0	15.12	35.20	7.94	97.9	3.3	8.0	3.8	7.91		3.87	3.13
	C3	S2	R2	Mid-flood		15.12	35.16	7.94	97.9	3.3	8.0	3.2				
	C3	M1	R1	Mid-flood	9.6	15.12	35.04	7.88	97.1	4.1	8.0	2.7				
	C3	M2	R2	Mid-flood		15.12	35.04	7.88	97.1	4.1	8.0	2.4				
	C3	B1	R1	Mid-flood	18.2	15.14	35.08	7.86	96.9	4.2	8.0	2.9		7.86		
	C3	B2	R2	Mid-flood		15.14	35.08	7.86	97.0	4.2	8.0	3.8				
	I3	S1	R1	Mid-flood	1.0	15.01	35.53	8.14	100.4	4.2	8.0	5.4	8.01		4.55	5.87
	I3	S2	R2	Mid-flood		15.01	35.53	8.14	100.4	4.3	8.0	5.5				
	I3	M1	R1	Mid-flood	5.6	15.02	35.53	7.87	97.1	4.6	8.0	4.2				
	I3	M2	R2	Mid-flood		15.02	35.53	7.87	97.1	4.6	8.0	5.4				
	I3	B1	R1	Mid-flood	10.2	15.03	35.53	7.85	96.8	4.8	7.9	8.1		7.85		
	I3	B2	R2	Mid-flood		15.03	35.53	7.85	96.8	4.8	7.9	6.6				
	I4	S1	R1	Mid-flood	1.0	14.98	35.11	8.03	98.7	4.5	8.0	4.8	7.96		4.40	5.53
	I4	S2	R2	Mid-flood		14.98	35.11	8.03	98.7	4.5	8.0	4.8				
	I4	M1	R1	Mid-flood	4.9	15.01	35.22	7.88	97.0	4.2	8.0	6.4				
	I4	M2	R2	Mid-flood		15.01	35.22	7.88	97.0	4.2	8.0	6.6				
	I4	B1	R1	Mid-flood	8.7	15.01	35.20	7.82	96.3	4.5	8.0	5.5		7.82		
	I4	B2	R2	Mid-flood		15.01	35.20	7.82	96.3	4.5	8.0	5.1				
	G1	S1	R1	Mid-flood	1.0	15.27	35.58	7.96	98.8	3.9	7.9	3.4	7.92		4.07	3.83
	G1	S2	R2	Mid-flood		15.27	35.58	7.96	98.8	3.9	7.9	3.5				
	G1	M1	R1	Mid-flood	5.8	15.29	35.58	7.87	97.6	4.1	7.9	4.3				
	G1	M2	R2	Mid-flood		15.29	35.58	7.87	97.6	4.1	7.9	4.8				
	G1	B1	R1	Mid-flood	10.6	15.29	35.58	7.81	96.9	4.2	7.9	3.5		7.81		
	G1	B2	R2	Mid-flood		15.29	35.58	7.81	96.9	4.2	7.9	3.5				

Monitoring Date	Station	Depth + Replicate No.	Replicate	Tidal Level	Depth (m)	Water Temperature (° C)	Salinity (ppt)	D.O. (mg/L)	D.O. Saturation (%)	Turbidity (NTU)	pH	SS (mg/L)	D.O. (mg/L) Surface & Middle	D.O. (mg/L) Bottom	Turbidity (Depth-averaged) (NTU)	SS (Depth-averaged) (mg/L)
7/2/2018	E1	S1	R1	Mid-ebb	1.0	15.40	33.82	8.06	99.1	3.2	8.0	4.6	8.00		3.33	4.50
	E1	S2	R2	Mid-ebb		15.40	33.82	8.06	99.1	3.2	8.0	3.3				
	E1	M1	R1	Mid-ebb	19.1	15.37	33.82	7.94	97.7	3.2	8.0	4.1				
	E1	M2	R2	Mid-ebb		15.37	33.82	7.94	97.7	3.2	8.0	3.9				
	E1	B1	R1	Mid-ebb	37.1	15.34	33.83	7.92	97.3	3.6	8.0	6.3	7.92			
	E1	B2	R2	Mid-ebb		15.34	33.83	7.92	97.3	3.6	8.0	4.8				
	F1	S1	R1	Mid-ebb	1.0	15.21	33.14	8.15	99.5	4.3	8.0	3.4	8.11		5.90	4.00
	F1	S2	R2	Mid-ebb		15.21	33.14	8.15	99.5	4.3	8.0	3.4				
	F1	M1	R1	Mid-ebb	8.4	15.18	33.31	8.07	98.6	7.9	8.0	3.5				
	F1	M2	R2	Mid-ebb		15.18	33.31	8.07	98.6	7.9	8.0	4.8				
	F1	B1	R1	Mid-ebb	15.7	15.09	33.69	8.02	98.0	5.5	8.0	5.0	8.02			
	F1	B2	R2	Mid-ebb		15.09	33.69	8.02	98.0	5.5	8.0	3.9				
	B1	S1	R1	Mid-ebb	1.0	15.14	33.74	8.58	104.9	4.1	8.0	4.8	8.53		4.03	4.85
	B1	S2	R2	Mid-ebb		15.14	33.74	8.58	104.9	4.1	8.0	4.7				
	B1	M1	R1	Mid-ebb	3.4	15.07	33.74	8.47	103.5	3.8	8.0	5.5				
	B1	M2	R2	Mid-ebb		15.07	33.74	8.47	103.5	3.8	8.0	4.0				
	B1	B1	R1	Mid-ebb	5.7	14.97	33.71	8.42	102.6	4.2	8.0	4.3	8.42			
	B1	B2	R2	Mid-ebb		14.97	33.71	8.42	102.6	4.2	8.0	5.8				
	C2	S1	R1	Mid-ebb	1.0	15.28	33.63	8.14	99.8	3.2	8.0	4.8	8.12		3.00	6.23
	C2	S2	R2	Mid-ebb		15.28	33.63	8.14	99.8	3.2	8.0	6.1				
	C2	M1	R1	Mid-ebb	8.7	15.14	33.62	8.10	98.9	3.0	8.0	6.5				
	C2	M2	R2	Mid-ebb		15.14	33.62	8.10	98.9	3.0	8.0	7.7				
	C2	B1	R1	Mid-ebb	16.4	15.10	33.59	8.09	98.7	2.8	8.0	6.1	8.09			
	C2	B2	R2	Mid-ebb		15.10	33.59	8.09	98.7	2.8	8.0	6.2				
	C3	S1	R1	Mid-ebb	1.0	15.33	33.54	8.17	100.2	3.0	8.0	3.4	8.13		3.27	5.47
	C3	S2	R2	Mid-ebb		15.33	33.54	8.17	100.2	3.0	8.0	4.9				
	C3	M1	R1	Mid-ebb	10.2	15.21	33.50	8.09	98.9	3.2	8.0	4.2				
	C3	M2	R2	Mid-ebb		15.21	33.50	8.09	98.9	3.2	8.0	4.5				
	C3	B1	R1	Mid-ebb	19.4	15.13	33.47	8.08	98.6	3.6	8.0	8.6	8.08			
	C3	B2	R2	Mid-ebb		15.13	33.47	8.08	98.6	3.6	8.0	7.2				
	I3	S1	R1	Mid-ebb	1.0	15.66	33.84	8.38	103.6	3.2	8.0	5.4	8.37		5.20	4.33
	I3	S2	R2	Mid-ebb		15.66	33.84	8.38	103.6	3.2	8.0	5.1				
	I3	M1	R1	Mid-ebb	5.4	15.59	33.84	8.36	103.2	4.9	8.0	3.5				
	I3	M2	R2	Mid-ebb		15.59	33.84	8.36	103.2	4.9	8.0	3.9				
	I3	B1	R1	Mid-ebb	9.7	15.36	33.82	8.33	102.4	7.5	8.0	3.7	8.33			
	I3	B2	R2	Mid-ebb		15.36	33.82	8.33	102.4	7.5	8.0	4.4				
	I4	S1	R1	Mid-ebb	1.0	15.42	33.79	8.66	106.5	3.3	8.0	3.3	8.59		3.63	6.38
	I4	S2	R2	Mid-ebb		15.42	33.79	8.66	106.5	3.3	8.0	4.9				
	I4	M1	R1	Mid-ebb	5.1	15.30	33.77	8.52	104.5	4.2	8.0	6.2				
	I4	M2	R2	Mid-ebb		15.30	33.77	8.52	104.5	4.2	8.0	6.3				
	I4	B1	R1	Mid-ebb	9.2	15.19	33.76	8.46	103.6	3.4	8.0	8.5	8.46			
	I4	B2	R2	Mid-ebb		15.19	33.76	8.46	103.6	3.4	8.0	9.1				
	G1	S1	R1	Mid-ebb	1.0	15.56	33.82	8.31	102.5	3.3	8.0	5.4	8.30		3.50	4.72
	G1	S2	R2	Mid-ebb		15.56	33.82	8.31	102.5	3.3	8.0	4.8				
	G1	M1	R1	Mid-ebb	6.6	15.44	33.84	8.29	102.0	3.2	8.0	4.1				
	G1	M2	R2	Mid-ebb		15.44	33.84	8.29	102.0	3.2	8.0	4.7				
	G1	B1	R1	Mid-ebb	12.1	15.37	33.75	8.26	101.5	4.0	8.0	4.5	8.26			
	G1	B2	R2	Mid-ebb		15.37	33.75	8.26	101.5	4.0	8.0	4.8				

Monitoring Date	Station	Depth + Replicate No.	Replicate	Tidal Level	Depth (m)	Water Temperature (° C)	Salinity (ppt)	D.O. (mg/L)	D.O. Saturation (%)	Turbidity (NTU)	pH	SS (mg/L)	D.O. (mg/L) Surface & Middle	D.O. (mg/L) Bottom	Turbidity (Depth-averaged) (NTU)	SS (Depth-averaged) (mg/L)
7/2/2018	E1	S1	R1	Mid-flood	1.0	15.44	33.78	8.00	98.5	3.3	8.0	5.0	7.95		3.50	4.62
	E1	S2	R2	Mid-flood		15.44	33.78	8.00	98.5	3.3	8.0	4.0				
	E1	M1	R1	Mid-flood	19.5	15.40	33.81	7.89	97.1	3.6	8.0	3.5				
	E1	M2	R2	Mid-flood		15.40	33.81	7.89	97.1	3.6	8.0	5.3				
	E1	B1	R1	Mid-flood	37.9	15.38	33.89	7.87	96.8	3.6	8.0	4.3		7.87		
	E1	B2	R2	Mid-flood		15.38	33.89	7.87	96.8	3.6	8.0	5.6				
	F1	S1	R1	Mid-flood	1.0	15.05	33.77	8.14	99.4	4.2	8.0	5.4	8.13		4.93	5.72
	F1	S2	R2	Mid-flood		15.05	33.77	8.14	99.4	4.2	8.0	4.5				
	F1	M1	R1	Mid-flood	8.3	15.04	33.80	8.12	99.1	4.8	8.0	6.5				
	F1	M2	R2	Mid-flood		15.04	33.80	8.12	99.1	4.8	8.0	6.1				
	F1	B1	R1	Mid-flood	15.5	15.04	33.81	8.10	98.9	5.8	8.0	5.6		8.10		
	F1	B2	R2	Mid-flood		15.04	33.81	8.10	98.9	5.8	8.0	6.2				
	B1	S1	R1	Mid-flood	1.0	15.14	33.75	8.49	103.9	3.2	8.0	5.1	8.50		3.53	5.63
	B1	S2	R2	Mid-flood		15.14	33.75	8.49	103.9	3.2	8.0	4.1				
	B1	M1	R1	Mid-flood	3.5	15.06	33.75	8.50	103.8	3.6	8.0	5.9				
	B1	M2	R2	Mid-flood		15.06	33.75	8.50	103.8	3.6	8.0	4.6				
	B1	B1	R1	Mid-flood	6.0	15.03	33.76	8.51	103.8	3.8	8.0	6.7		8.51		
	B1	B2	R2	Mid-flood		15.03	33.76	8.51	103.8	3.8	8.0	7.4				
	C2	S1	R1	Mid-flood	1.0	15.37	33.80	8.14	100.1	3.1	8.0	3.1	8.15		3.40	5.13
	C2	S2	R2	Mid-flood		15.37	33.80	8.14	100.1	3.1	8.0	5.4				
	C2	M1	R1	Mid-flood	9.7	15.30	33.81	8.15	100.0	3.9	8.0	4.7				
	C2	M2	R2	Mid-flood		15.30	33.81	8.15	100.0	3.9	8.0	4.0				
	C2	B1	R1	Mid-flood	18.3	15.30	33.82	8.21	100.7	3.2	8.0	7.3		8.21		
	C2	B2	R2	Mid-flood		15.30	33.82	8.21	100.7	3.2	8.0	6.3				
	C3	S1	R1	Mid-flood	1.0	15.21	33.77	8.13	99.6	3.3	8.0	4.6	8.14		3.67	4.55
	C3	S2	R2	Mid-flood		15.21	33.77	8.13	99.6	3.3	8.0	4.2				
	C3	M1	R1	Mid-flood	9.7	15.21	33.78	8.15	99.9	3.6	8.0	5.0				
	C3	M2	R2	Mid-flood		15.21	33.78	8.15	99.8	3.6	8.0	4.7				
	C3	B1	R1	Mid-flood	18.4	15.20	33.78	8.19	100.3	4.1	8.0	4.8		8.19		
	C3	B2	R2	Mid-flood		15.20	33.78	8.19	100.3	4.1	8.0	4.0				
	I3	S1	R1	Mid-flood	1.0	15.28	33.74	8.41	103.1	3.1	8.0	4.8	8.41		2.95	5.40
	I3	S2	R2	Mid-flood		15.28	33.74	8.41	103.1	3.1	8.0	4.2				
	I3	M1	R1	Mid-flood	4.8	15.24	33.74	8.41	103.1	3.2	8.0	5.1				
	I3	M2	R2	Mid-flood		15.24	33.74	8.41	103.1	3.2	8.0	4.1				
	I3	B1	R1	Mid-flood	8.6	15.21	33.75	8.47	103.8	2.6	8.0	7.4		8.48		
	I3	B2	R2	Mid-flood		15.21	33.75	8.48	103.8	2.5	8.0	6.8				
	I4	S1	R1	Mid-flood	1.0	15.21	33.76	8.44	103.3	3.2	8.0	7.1	8.41		5.67	7.27
	I4	S2	R2	Mid-flood		15.21	33.76	8.44	103.3	3.2	8.0	7.1				
	I4	M1	R1	Mid-flood	4.4	15.19	33.77	8.37	102.6	4.4	8.0	5.8				
	I4	M2	R2	Mid-flood		15.19	33.77	8.37	102.6	4.4	8.0	6.7				
	I4	B1	R1	Mid-flood	7.7	15.12	33.77	8.34	102.0	9.4	8.0	8.3		8.34		
	I4	B2	R2	Mid-flood		15.12	33.77	8.34	102.0	9.4	8.0	8.6				
	G1	S1	R1	Mid-flood	1.0	15.30	33.73	8.34	102.3	3.0	8.0	4.3	8.35		3.13	7.00
	G1	S2	R2	Mid-flood		15.30	33.73	8.34	102.3	3.0	8.0	5.5				
	G1	M1	R1	Mid-flood	6.5	15.27	33.77	8.36	102.6	3.1	8.0	8.8				
	G1	M2	R2	Mid-flood		15.27	33.77	8.36	102.6	3.1	8.0	8.6				
	G1	B1	R1	Mid-flood	11.9	15.24	33.77	8.51	104.4	3.3	8.0	7.8		8.51		
	G1	B2	R2	Mid-flood		15.24	33.77	8.51	104.4	3.3	8.0	7.0				



Monitoring Date	Station	Depth + Replicate No.	Replicate	Tidal Level	Depth (m)	Water Temperature (° C)	Salinity (ppt)	D.O. (mg/L)	D.O. Saturation (%)	Turbidity (NTU)	pH	SS (mg/L)	D.O. (mg/L) Surface & Middle	D.O. (mg/L) Bottom	Turbidity (Depth-averaged) (NTU)	SS (Depth-averaged) (mg/L)
9/2/2018	E1	S1	R1	Mid-ebb	1.0	15.26	33.62	8.08	99.0	3.9	7.9	6.0	8.04		3.60	7.17
	E1	S2	R2	Mid-ebb		15.26	33.62	8.08	99.0	3.9	7.9	7.5				
	E1	M1	R1	Mid-ebb	19.5	15.25	33.64	7.99	97.9	3.8	7.9	7.5				
	E1	M2	R2	Mid-ebb		15.25	33.64	7.99	97.9	3.8	7.9	8.1				
	E1	B1	R1	Mid-ebb	37.9	15.23	33.67	7.99	97.8	3.1	7.9	7.0		7.99		
	E1	B2	R2	Mid-ebb		15.23	33.67	7.99	97.9	3.1	7.9	6.9				
	F1	S1	R1	Mid-ebb	1.0	15.09	32.90	8.19	99.5	3.5	8.0	2.8	8.25		3.53	2.73
	F1	S2	R2	Mid-ebb		15.09	32.90	8.27	100.6	3.3	8.0	3.4				
	F1	M1	R1	Mid-ebb	8.1	15.09	32.91	8.27	100.5	3.3	8.0	2.2				
	F1	M2	R2	Mid-ebb		15.09	32.91	8.27	100.6	3.3	8.0	2.1				
	F1	B1	R1	Mid-ebb	15.1	15.08	32.92	8.04	97.7	3.9	8.0	3.4		8.04		
	F1	B2	R2	Mid-ebb		15.08	32.92	8.04	97.8	3.9	8.0	2.5				
	B1	S1	R1	Mid-ebb	1.0	15.05	32.66	8.32	100.9	3.0	8.0	4.6	8.24		3.82	6.67
	B1	S2	R2	Mid-ebb		15.05	32.66	8.31	100.8	2.9	8.0	7.2				
	B1	M1	R1	Mid-ebb	3.1	15.07	32.68	8.17	99.2	3.5	8.0	8.4				
	B1	M2	R2	Mid-ebb		15.07	32.68	8.17	99.2	3.5	8.0	8.4				
	B1	B1	R1	Mid-ebb	5.2	15.05	32.70	7.97	96.7	5.0	8.0	7.8		7.97		
	B1	B2	R2	Mid-ebb		15.05	32.70	7.97	96.7	5.0	8.0	3.6				
	C2	S1	R1	Mid-ebb	1.0	15.18	32.85	8.09	98.5	2.9	8.0	5.0	8.07		3.27	4.12
	C2	S2	R2	Mid-ebb		15.18	32.85	8.10	98.6	2.9	8.0	5.2				
	C2	M1	R1	Mid-ebb	8.9	15.15	32.89	8.05	98.0	3.1	8.0	4.3				
	C2	M2	R2	Mid-ebb		15.15	32.89	8.05	98.0	3.1	8.0	4.0				
	C2	B1	R1	Mid-ebb	16.7	15.12	32.91	7.92	96.4	3.8	8.0	3.4		7.92		
	C2	B2	R2	Mid-ebb		15.12	32.91	7.92	96.4	3.8	8.0	2.8				
	C3	S1	R1	Mid-ebb	1.0	15.15	32.90	8.10	98.5	3.4	8.0	2.8	8.08		3.40	4.78
	C3	S2	R2	Mid-ebb		15.15	32.90	8.10	98.6	3.3	8.0	3.2				
	C3	M1	R1	Mid-ebb	9.6	15.17	32.91	8.05	98.1	3.2	8.0	3.8				
	C3	M2	R2	Mid-ebb		15.17	32.91	8.05	98.0	3.2	8.0	7.2				
	C3	B1	R1	Mid-ebb	18.2	15.15	32.93	7.97	97.0	3.6	8.0	7.9		7.97		
	C3	B2	R2	Mid-ebb		15.15	32.93	7.97	97.0	3.7	8.0	3.8				
	I3	S1	R1	Mid-ebb	1.0	15.26	32.45	8.34	101.4	2.9	8.0	2.3	8.28		2.77	3.65
	I3	S2	R2	Mid-ebb		15.26	32.45	8.34	101.4	2.9	8.0	4.4				
	I3	M1	R1	Mid-ebb	5.3	15.27	32.43	8.21	99.9	2.8	8.0	4.2				
	I3	M2	R2	Mid-ebb		15.27	32.43	8.21	99.9	2.8	8.0	3.8				
	I3	B1	R1	Mid-ebb	9.5	15.27	32.34	8.14	98.9	2.6	8.0	3.5		8.14		
	I3	B2	R2	Mid-ebb		15.27	32.34	8.14	98.9	2.6	8.0	3.7				
	I4	S1	R1	Mid-ebb	1.0	15.14	32.66	8.44	102.6	3.4	8.0	4.6	8.40		3.20	5.65
	I4	S2	R2	Mid-ebb		15.14	32.66	8.44	102.6	3.4	8.0	4.7				
	I4	M1	R1	Mid-ebb	4.9	15.14	32.69	8.36	101.5	3.0	8.0	3.7				
	I4	M2	R2	Mid-ebb		15.14	32.69	8.36	101.5	3.0	8.0	8.5				
	I4	B1	R1	Mid-ebb	8.8	15.13	32.69	8.13	98.8	3.1	8.0	7.2		8.13		
	I4	B2	R2	Mid-ebb		15.13	32.69	8.12	98.7	3.3	8.0	5.2				
	G1	S1	R1	Mid-ebb	1.0	15.24	33.50	8.28	101.3	4.8	8.0	8.2	8.25		5.10	6.90
	G1	S2	R2	Mid-ebb		15.24	33.50	8.28	101.3	4.8	8.0	6.6				
	G1	M1	R1	Mid-ebb	6.6	15.24	33.59	8.21	100.6	5.1	8.0	6.1				
	G1	M2	R2	Mid-ebb		15.24	33.59	8.21	100.6	5.1	8.0	7.6				
	G1	B1	R1	Mid-ebb	12.2	15.24	33.61	8.02	98.2	5.4	7.9	6.6		8.02		
	G1	B2	R2	Mid-ebb		15.24	33.61	8.02	98.2	5.4	7.9	6.3				

Monitoring Date	Station	Depth + Replicate No.	Replicate	Tidal Level	Depth (m)	Water Temperature (° C)	Salinity (ppt)	D.O. (mg/L)	D.O. Saturation (%)	Turbidity (NTU)	pH	SS (mg/L)	D.O. (mg/L) Surface & Middle	D.O. (mg/L) Bottom	Turbidity (Depth-averaged) (NTU)	SS (Depth-averaged) (mg/L)
9/2/2018	E1	S1	R1	Mid-flood	1.0	15.29	32.98	8.36	102.1	4.3	8.0	2.6	8.30		5.20	4.35
	E1	S2	R2	Mid-flood		15.29	32.98	8.36	102.1	4.3	8.0	3.8				
	E1	M1	R1	Mid-flood	19.9	15.21	32.97	8.23	100.3	5.0	8.0	4.5				
	E1	M2	R2	Mid-flood		15.21	32.97	8.23	100.3	5.0	8.0	5.5				
	E1	B1	R1	Mid-flood	38.8	15.00	32.98	8.15	98.9	6.3	8.0	4.4		8.15		
	E1	B2	R2	Mid-flood		15.00	32.98	8.15	98.9	6.3	8.0	5.3				
	F1	S1	R1	Mid-flood	1.0	15.12	32.16	8.22	99.5	3.7	8.0	2.9	8.22		3.67	3.02
	F1	S2	R2	Mid-flood		15.12	32.16	8.22	99.5	3.7	8.0	3.3				
	F1	M1	R1	Mid-flood	8.4	15.09	32.20	8.22	99.5	3.7	8.0	2.3				
	F1	M2	R2	Mid-flood		15.09	32.20	8.22	99.5	3.7	8.0	2.6				
	F1	B1	R1	Mid-flood	15.7	15.08	32.50	8.03	97.3	3.6	8.0	3.2		8.03		
	F1	B2	R2	Mid-flood		15.08	32.50	8.03	97.3	3.6	8.0	3.8				
	B1	S1	R1	Mid-flood	1.0	15.30	32.79	8.55	104.3	3.0	8.0	4.2	8.49		3.20	5.18
	B1	S2	R2	Mid-flood		15.30	32.79	8.55	104.3	3.0	8.0	3.0				
	B1	M1	R1	Mid-flood	3.4	15.12	32.87	8.43	102.6	3.1	8.0	2.9				
	B1	M2	R2	Mid-flood		15.12	32.87	8.43	102.6	3.1	8.0	8.1				
	B1	B1	R1	Mid-flood	5.7	15.09	32.86	8.13	98.8	3.5	8.0	9.5		8.13		
	B1	B2	R2	Mid-flood		15.09	32.86	8.13	98.8	3.5	8.0	3.4				
	C2	S1	R1	Mid-flood	1.0	15.26	32.86	8.17	99.6	3.6	8.0	2.1	8.10		3.58	3.27
	C2	S2	R2	Mid-flood		15.26	32.86	8.16	99.6	3.3	8.0	4.7				
	C2	M1	R1	Mid-flood	8.9	15.22	32.86	8.03	97.8	3.5	8.0	3.6				
	C2	M2	R2	Mid-flood		15.22	32.86	8.03	97.8	3.5	8.0	3.9				
	C2	B1	R1	Mid-flood	16.7	15.21	32.87	7.98	97.2	3.8	8.0	3.1		7.98		
	C2	B2	R2	Mid-flood		15.21	32.87	7.98	97.2	3.8	8.0	2.2				
	C3	S1	R1	Mid-flood	1.0	15.26	32.75	8.17	99.6	3.3	8.0	3.9	8.13		4.37	3.58
	C3	S2	R2	Mid-flood		15.26	32.75	8.17	99.6	3.3	8.0	3.0				
	C3	M1	R1	Mid-flood	10.2	15.21	32.77	8.08	98.4	6.0	8.0	2.6				
	C3	M2	R2	Mid-flood		15.21	32.77	8.08	98.4	6.0	8.0	4.1				
	C3	B1	R1	Mid-flood	19.4	15.16	32.78	8.00	97.3	3.8	8.0	3.3		8.00		
	C3	B2	R2	Mid-flood		15.16	32.78	8.00	97.3	3.8	8.0	4.6				
	I3	S1	R1	Mid-flood	1.0	15.44	32.93	8.44	103.3	3.6	8.0	4.5	8.43		3.57	4.65
	I3	S2	R2	Mid-flood		15.44	32.93	8.44	103.3	3.6	8.0	5.7				
	I3	M1	R1	Mid-flood	4.9	15.25	32.92	8.41	102.6	3.5	8.0	4.9				
	I3	M2	R2	Mid-flood		15.25	32.92	8.41	102.6	3.5	8.0	4.9				
	I3	B1	R1	Mid-flood	8.8	15.25	32.92	8.18	99.7	3.6	8.0	5.5		8.18		
	I3	B2	R2	Mid-flood		15.25	32.92	8.18	99.7	3.6	8.0	2.4				
	I4	S1	R1	Mid-flood	1.0	15.21	32.95	8.38	102.1	3.2	8.0	3.6	8.34		3.27	5.03
	I4	S2	R2	Mid-flood		15.21	32.95	8.38	102.1	3.2	8.0	5.4				
	I4	M1	R1	Mid-flood	4.9	15.16	32.91	8.30	101.0	3.2	8.0	4.6				
	I4	M2	R2	Mid-flood		15.16	32.91	8.30	101.0	3.2	8.0	5.8				
	I4	B1	R1	Mid-flood	8.8	15.13	32.91	8.13	98.9	3.4	8.0	7.3		8.13		
	I4	B2	R2	Mid-flood		15.13	32.91	8.13	98.9	3.4	8.0	3.5				
	G1	S1	R1	Mid-flood	1.0	15.41	32.92	8.53	104.4	2.5	8.0	4.1	8.47		3.20	4.50
	G1	S2	R2	Mid-flood		15.41	32.92	8.53	104.4	2.5	8.0	3.8				
	G1	M1	R1	Mid-flood	6.2	15.21	32.90	8.41	102.5	2.9	8.0	4.7				
	G1	M2	R2	Mid-flood		15.21	32.90	8.41	102.5	2.9	8.0	3.1				
	G1	B1	R1	Mid-flood	11.3	15.19	32.90	8.19	99.8	4.2	8.0	6.3		8.19		
	G1	B2	R2	Mid-flood		15.19	32.90	8.19	99.8	4.2	8.0	5.0				

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