



Asia Pacific Gateway (APG) - Tseung Kwan O

Post Project Water Quality Monitoring Report

29 June 2016

Submitted by

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Asia Pacific Gateway (APG) – Tseung Kwan O
Environmental Certification Sheet
EP-485/2014

Reference Document/Plan

Document/ Plan to be Certified / Verified:	Post Project Water Quality Monitoring Report
Date of Report:	29 June 2016
Date prepared by ET:	29 June 2016
Date received by IEC:	29 June 2016

Reference EM&A Manual

EM&A Manual:	Section 2
<i>Content: Reporting on Post Project Monitoring</i>	
2.5	<p>"A Post Project Monitoring Report to review the environmental status after Project marine installation and compare with the results as presented in the relevant Baseline Monitoring Report shall be provided within one month after completion of the Project marine installation works."</p> <p>"A Post Project Monitoring Report shall include the following details: brief project background information; drawings showing locations of the baseline monitoring stations; full Project marine installation works programme with milestones of environmental protection/mitigation activities annotated; monitoring results together with the information including monitoring methodology, parameters monitored, monitoring locations (and depth), monitoring date, time, frequency and duration. The monitoring results should show the relationship between the Control and the Impact monitoring stations and compliance or non-compliance with respect to the Action/Limit Levels; review the environmental status after Project marine installation works and compare with results presented in the relevant Baseline Monitoring Report and comments and conclusions."</p>
EP Condition:	Condition 2
<i>Content: Impact Monitoring Report on Water Quality</i>	
2.5	<p>"(ii)(c): To monitor the environmental impacts and timely implementation of the recommended mitigation measures, the Permit Holder shall submit to the director four hard copies and one electronic copy of post project monitoring report within one month after completion of the marine works, as defined in the approved EM&A Manual."</p> <p>"All environmental monitoring and audit results submitted under this Permit shall be true, valid and correct. Before submission to the Director, the reports as required in Condition 2.4 and 2.5 (ii) shall be certified by the independent checker that all mitigation measures recommended in the Project Profile (Register No. PP-496/2013) have been fully implemented."</p>

ET Certification

I hereby certify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-485/2014.

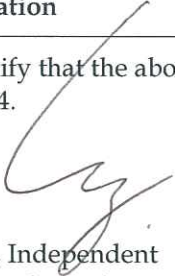


Terence Fong, Environmental
Team Leader:

Date: 29 June 2016

IEC Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-485/2014.



Vincent Lai, Independent
Environmental Checker:

Date: 29 June 2016




Asia Pacific Gateway (APG) – Tseung Kwan O

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Post Project Water Quality Monitoring Report

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Client:		Project No:			
China Mobile International Limited (CMI Ltd)		0324228			
Summary:		Date:			
<p>This document presents the monitoring requirements, methodologies and results of the impact marine water quality measurements at the monitoring locations near the proposed submarine cable installation works in the post project monitoring period from 13 to 21 June 2016.</p>		29 June 2016			
		Approved by:			
		 Terence Fong Partner			
v0	Post Project Water Quality Monitoring Report_v0	YL	FZ	TF	29/6/16
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> <p>This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.</p>		Distribution <ul style="list-style-type: none"> <input type="checkbox"/> Internal <input checked="" type="checkbox"/> Public <input type="checkbox"/> Confidential 			
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EXECUTIVE SUMMARY

The installation works of the Asia Pacific Gateway - Tseung Kwan O (APG-TKO) submarine cable commenced on 17 May 2016 and completed on 5 June 2016. This is the *Post Project Water Quality Monitoring Report*, presenting results and findings of the post project water quality monitoring conducted during the period from 13 to 21 June 2016, in accordance with the *Environmental Monitoring and Audit Manual (EM&A Manual)*.

In situ water quality measurements and water samples were taken at the monitoring stations on three occasions (total six days, 13, 15-17, and 20-21 June 2016) at each location, with the interval between two sets of monitoring at any one location being no less than 36 hours. Samples were taken at three depths (surface, middle and bottom) where practical and the water quality sampling was undertaken within a 4-hour window of 2 hours before and 2 hours after mid flood and mid-ebb tides. The tidal range selected for the baseline monitoring was at least 0.5 m for both flood and ebb tides as far as practicable.

Post project water quality monitoring was conducted after the confirmation that the Project marine works had been completed. The overall water quality (represented by DO, turbidity and SS) in post project monitoring was slightly different to the baseline monitoring results but remained good quality with high DO levels and low turbidity and SS levels. During the post project monitoring water quality at the impact stations was found to be similar to that at the control stations which are located at sufficient distance from the cable alignment that it is unlikely the water quality there would be affected by the Project works. Therefore it is considered that the overall water quality changes in DO, Turbidity and SS levels during the post project monitoring period, are a reflection of natural background fluctuation.

It is concluded that the Project works had negligible impact on water quality, i.e. did not cause deterioration of water quality.

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) has been appointed by China Mobile International Limited (CMI Ltd) as the Environmental Team (ET) to implement the Environmental Monitoring and Audit (EM&A) programme for the 'Asia Pacific Gateway (APG) - Tseung Kwan O' (hereafter referred to as the 'Project').

1.1 PURPOSE OF THE REPORT

This is the *Post Project Water Quality Monitoring Report*, summarising the results of post project water quality monitoring as part of the EM&A programme during the period from 13 to 21 June 2016. The post project monitoring results have been compared to the baseline water quality monitoring results in order to investigate whether the Project marine works had any impact on water quality in the vicinity of the Project.

1.2 STRUCTURE OF THE REPORT

The structure of the Report is as follows:

Section 1 : Introduction

Provides details of the background, purpose and report structure.

Section 2 : Project Information

Summarises background and scope of the project, the marine works undertaken and the status of Environmental Permits/Licenses during the reporting period.

Section 3 : Water Quality Monitoring Requirements

Summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, and monitoring locations.

Section 4 : Implementation Status of Environmental Mitigation Measures

Summarises the implementation of environmental protection measures during the reporting period.

Section 5 : Post Project Monitoring Results

Summarises the monitoring results obtained in the post project monitoring period.

Section 6 : Conclusions

Presents the key findings of the post project monitoring results.

2.1

BACKGROUND

In order to help meet the tremendous telecommunication services requirements for intra-Asia connectivity between South East Asia and North Asia, the APG Consortium has decided to build a submarine telecommunication cable system, which will be approximately 10,400 km in length, connecting the major business hubs across the region – the Asia Pacific Gateway (APG). The cable will link up with several countries, including Malaysia, Singapore, Vietnam, Taiwan, Mainland China, Japan, Korea and the Hong Kong Special Administrative Region (HKSAR). Since the cable that branches to HKSAR will ultimately connect to land at Tseung Kwan O (TKO), the HKSAR section of the submarine cable will be referred to as the APG-TKO cable.

As one of the members of the APG Consortium, China Mobile International Limited (CMI) proposes to install the APG-TKO section of the cable. The proposed cable will land via an existing Beach Manhole (BMH) within the TKO Industrial Estate on the reclaimed land and ultimately connect with a Cable Landing Station in the TKO Industrial Estate. It should be noted that Tseung Kwan O is currently the landing site for a number of submarine cables. The proposed submarine cable will travel west and southward from TKO as it approaches the Tathong Channel. After crossing the Tathong Channel and near to Cape Collinson, the cable then runs approximately parallel to the Tathong Channel until north of Sung Kong Island where it then turns eastward to the boundary of HKSAR waters where it enters the South China Sea. At the southeast offshore waters, it will be necessary to install a grout mattress to protect the cable where it crosses Hong Kong Electric Co., Ltd's (HKE) gas pipeline. A map of the proposed cable route is presented in *Figure 2.1*.

The Project Profile ([PP-496/2013](#)) (which includes an assessment of the potential environmental impacts associated with the installation of the submarine telecommunications cable system within HKSAR, including the connection to land at TKO), 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)*. EPD subsequently issued an approval letter on *Application for Permission to Apply Directly for Environmental Permit* on 15th November 2013 ([DIR-233/2013](#)) and issued an EP on 18 February 2014 ([EP-485/2014](#)).

Although no unacceptable environmental impacts have been identified, it was recommended that during APG-TKO installation works an Environmental Monitoring and Audit (EM&A) programme be conducted. The key aspects of the EM&A programme include Water Quality Monitoring and Coral Monitoring as well as the implementation a Marine Mammal (mainly Finless Porpoise) Exclusion Zone, conducted according to the location of works.

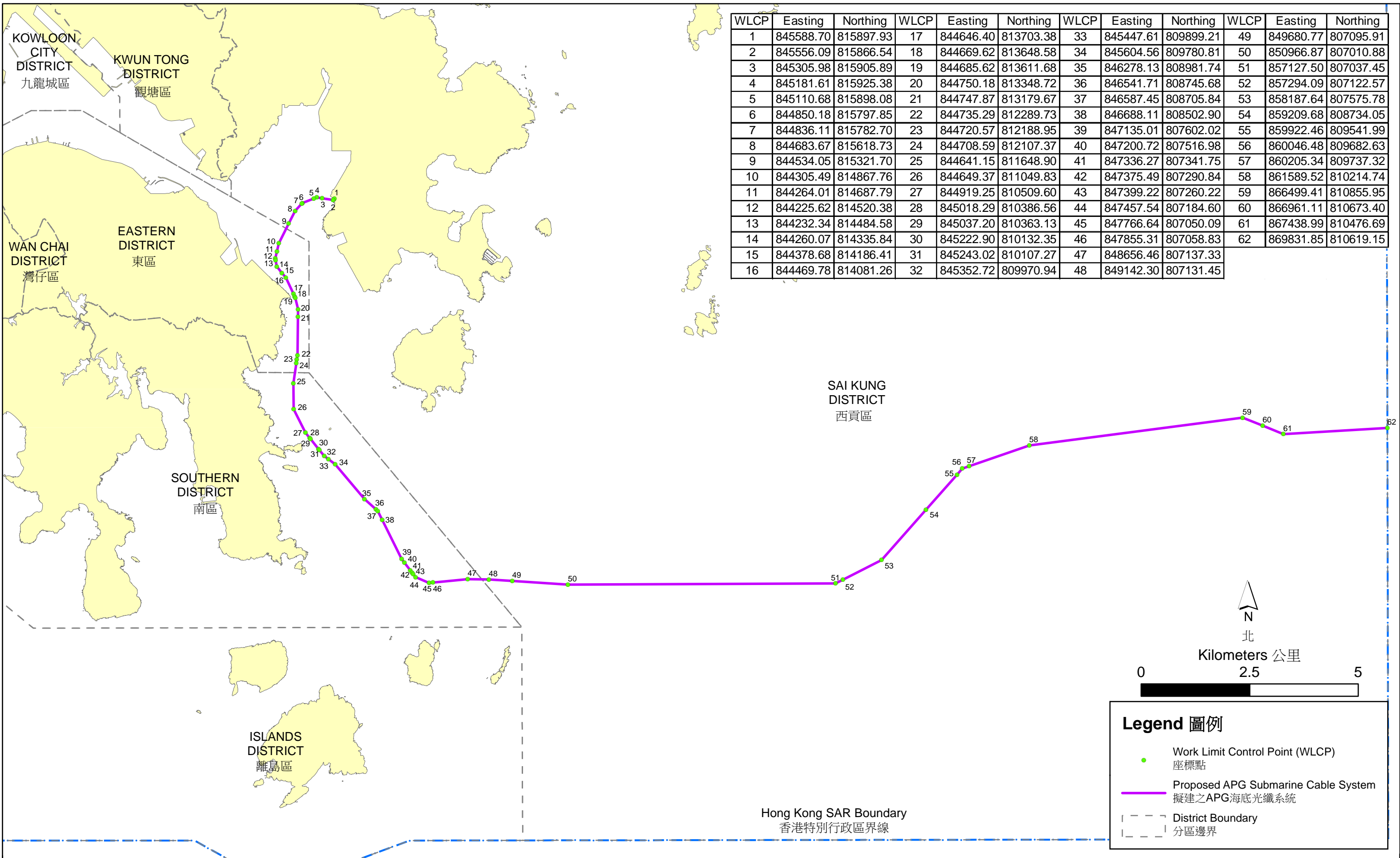


Figure 2.1
圖 2.1

Proposed APG Submarine Cable System
擬建之APG海底光纖系統

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[EP-485/2014](#) *Special Condition 2.5* states that an EM&A programme should be implemented in accordance with the procedures and requirements set out in the *EM&A Manual*. In accordance with the *EM&A Manual*, water quality monitoring is required for the Project, including baseline monitoring, impact monitoring and site audit and post Project monitoring.

Baseline water quality Monitoring was conducted in in Zones A, B and C between 27 April 2016 and 5 May 2016 and the results were presented in the *Baseline Water Quality Monitoring Report*.

Impact water quality monitoring commenced on 17 May 2016, in accordance with the *EM&A Manual*. The impact water quality monitoring was used to reflect the water quality conditions and to identify potential water quality impacts during the cable installation works. With reference to the *EM&A Manual*, Impact Monitoring Reports were provided during Project marine installation work, weekly within three days after the relevant monitoring data were collected or became available. Repeated (*ad hoc*) monitoring was carried out accordingly if exceedance of Action and Limit Level were observed. All Project marine works were completed on 5 June 2016, with all impact-related monitoring (including repeated monitoring) requirements completed on 7 June 2016.

In accordance with the *EM&A Manual*, post project monitoring was conducted within three weeks after the completion of the cable installation works at the same location as the baseline monitoring stations during mid flood and mid ebb tides.

This *Post Project Water Quality Monitoring Report* presents the results and findings of post project monitoring, conducted in the period from 13 to 21 June 2016.

2.2 *SITE DESCRIPTION*

The submarine cable lands via an existing BMH within the TKO Industrial Estate on the reclaimed land and travels west and southward from TKO as it approached the Tathong Channel. After crossing the Tathong Channel and near to Cape Collinson, the cable then runs approximately parallel to the Tathong Channel until north of Sung Kong Island where it then turns eastward to the boundary of HKSAR waters where it enters the South China Sea. The APG-TKO submarine cable alignment within Hong Kong waters is shown in *Figure 2.1*.

2.3 *STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS*

A summary of the relevant permits, licences and reports on marine water quality for this Project is presented in *Table 2.1*.

Table 2.1 *Summary of Environmental Licensing, Notification, Permit and Reporting Status*

Permit / Licence / Reference	Validity Period	Remarks
Project Profile	PP-496/2013	Throughout the construction and operation stages
EM&A Manual	-	Submitted on 9 October 2013
Environmental Permit	EP-485/2014	Throughout the construction and operation stages
Baseline Water Quality - Monitoring Report	-	Approved by EPD on 17 January 2014
First Weekly Impact Water - Quality Monitoring Report	-	Granted by EPD on 18 February 2014
Second Weekly Impact Water - Quality Monitoring Report	-	Submitted on 9 May 2016
Site Inspection Report	-	Submitted on 26 May 2016
Third Weekly Impact Water - Quality Monitoring Report	-	Submitted on 3 June 2016
Fourth Weekly Impact Water - Quality Monitoring Report	-	Submitted on 6 June 2016

3.1 MONITORING LOCATIONS

In accordance with the *EM&A Manual*, post project water quality monitoring was carried out at the same twenty-six (26) stations as in baseline water quality monitoring. These stations are situated around the cable laying works in Junk Bay and near to Tung Lung Chau and Tai Long Pai and listed below. The locations are also shown in *Figure 3.1*.

- B1 is an Impact Station to monitor the impacts of cable installation works on the Big Wave Bay Beach;
- B2 is an Impact Station to monitor the impacts of cable installation works on the Rocky Bay Beach;
- B3 is an Impact Station to monitor the impacts of cable installation works on the Shek O Beach;
- E1 is an Impact Station to monitor impacts of cable installation works on Cape d' Aguilar Marine Reserve;
- E2 is an Impact Station to monitor the impacts of cable installation works on the coral communities at Tung Lung Chau;

(There is no Impact Station E3 as E3 represents coral communities along the coast of Ninepins, over 5 km from the cable installation works, and will not be affected by the Project due to the distance)

- E4 is the Impact Station to monitor the impacts of cable installation works on the coral communities at the coast of Sung Kong;
- E5 is the Impact Station to monitor the impacts of cable installation works on the coral communities at the coast of Waglan Island;
- E6 is an Impact Station to monitor the impacts of cable installation works on the coral communities at Tai Long Pai (the Gradient Station is not set due to the insufficient distance between this Impact Station and the nearby proposed cable works which may affect the cable laying works);
- E7 is an Impact Station to monitor the impacts of cable installation works on the coral communities along Junk Bay - South West;
- E8 is an Impact Station to monitor the impacts of cable installation works on the coral communities at Cape Collinson (the Gradient Station is not set due to the insufficient distance between this Impact Station to nearby proposed cable works which may affect the cable laying works);
- E9 is an Impact Station to monitor the impacts of cable installation works on the coral communities at Fat Tong Chau (the Gradient Station is not set due to the insufficient distance between this Impact Station to nearby proposed cable works which may affect the cable laying works);
- F1 is an Impact Station to monitor the impacts of cable installation works on the Tung Lung Chau Fish Culture Zone;



Figure 3.1
圖 3.1

Water Quality Monitoring Station
水質監測點

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- I1 is an Impact Station to monitor the impacts of cable installation works on the Shek O Headland SSSI;
- S1 is an Impact Station situated at the WSD Seawater Intake Point in Junk Bay. It is located within 500 m north of the cable alignment at Junk Bay and set up to monitor the effect of cable laying works in the area;
- S2 is an Impact Station to monitor the impacts of cable installation works on the WSD Seawater Intake at Siu Sai Wan;
- S3 is an Impact Station to monitor the impacts of cable installation works on the Pamela Youde Nethersole Eastern Hospital Cooling Water Intake at Heng Fa Chuen;
- G1 is a Gradient Station between S1 and the cable alignment;
- G2 is a Gradient Station between S2 and the cable alignment;
- G3 is a Gradient Station between F1 and the cable alignment;
- G4 is a Gradient Station between E2 and the cable alignment;
- G5 is the Gradient Station between E4 and the alignment;
- G6 is the Gradient Station between E5 and the alignment;
- G7 is a Gradient Station between E1 and the cable alignment;
- C1 is a Control Station (approximately 3 km from the proposed cable alignment) for Zone A. It is not supposed to be influenced by the cable laying works due to its remoteness to the construction works;
- C2 is a Control Station (approximately 4 km from the proposed cable alignment) for Zone B. It is not supposed to be influenced by the cable laying works due to its remoteness to the construction works; and
- C3 is a Control Station (approximately 3 km from the proposed cable alignment) for Zone C. It is not supposed to be influenced by the cable laying works due to its remoteness to the construction works.

Stations C1, E7, E8, E9, F1, G1, G2, G3, S1, S2, and S3 (i.e. eleven (11) stations) are located in Zone A (*Figure 3.2*).

Thirteen (13) stations (i.e. B1, B2, B3, C2, E1, E2, E6, E8, F1, G3, G4, G7 and I1) are located in Zone B (*Figure 3.3*)

Five (5) stations (i.e. C3, E4, E5, G5 and G6) are located in Zone C (*Figure 3.4*).

The above monitoring stations were sampled during post project monitoring.

The co-ordinates of these monitoring stations are listed in *Table 3.1*.

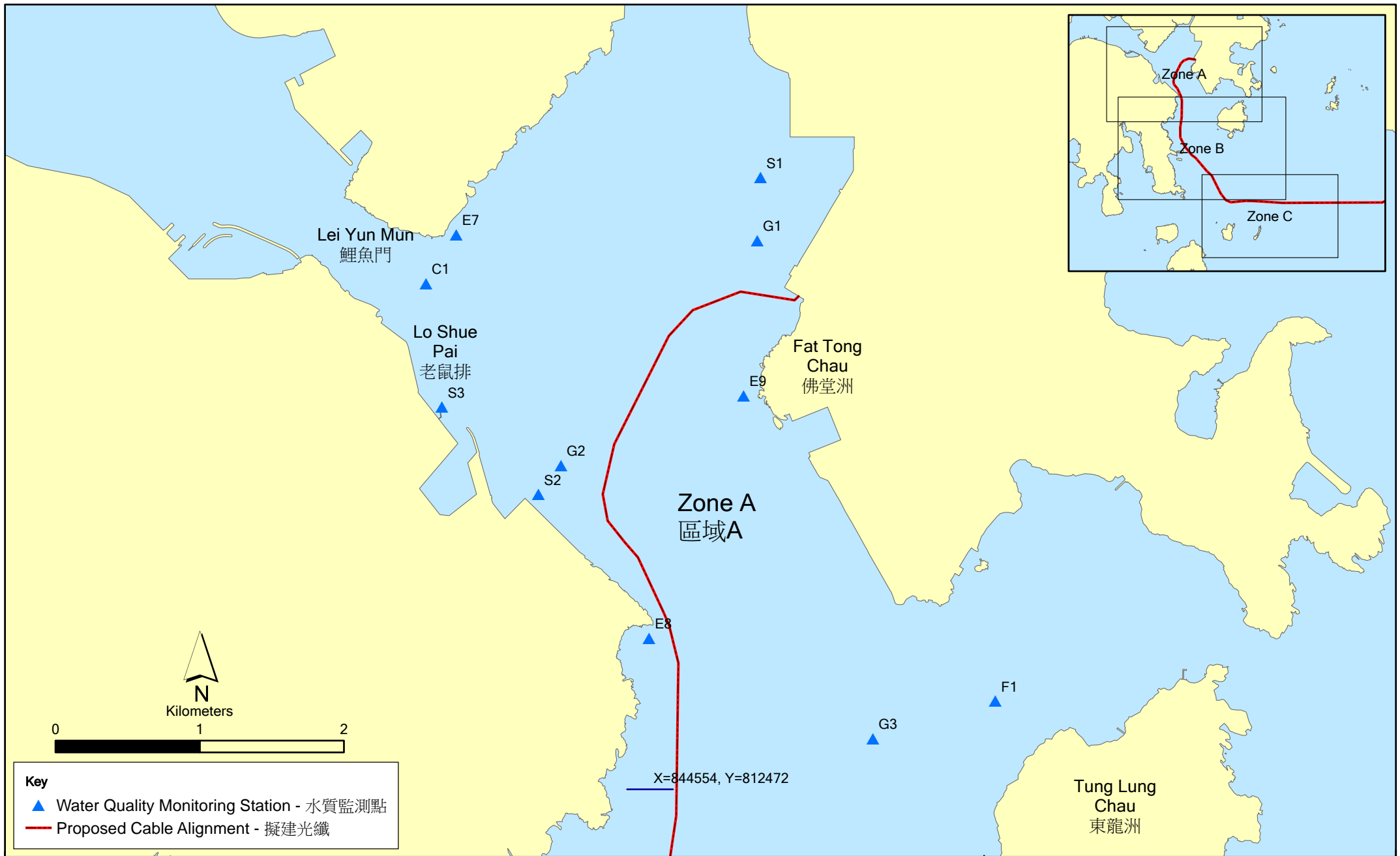


Figure 3.2
圖 3.2

Water Quality Monitoring Station (Zone A)
區域A內的水質監測點

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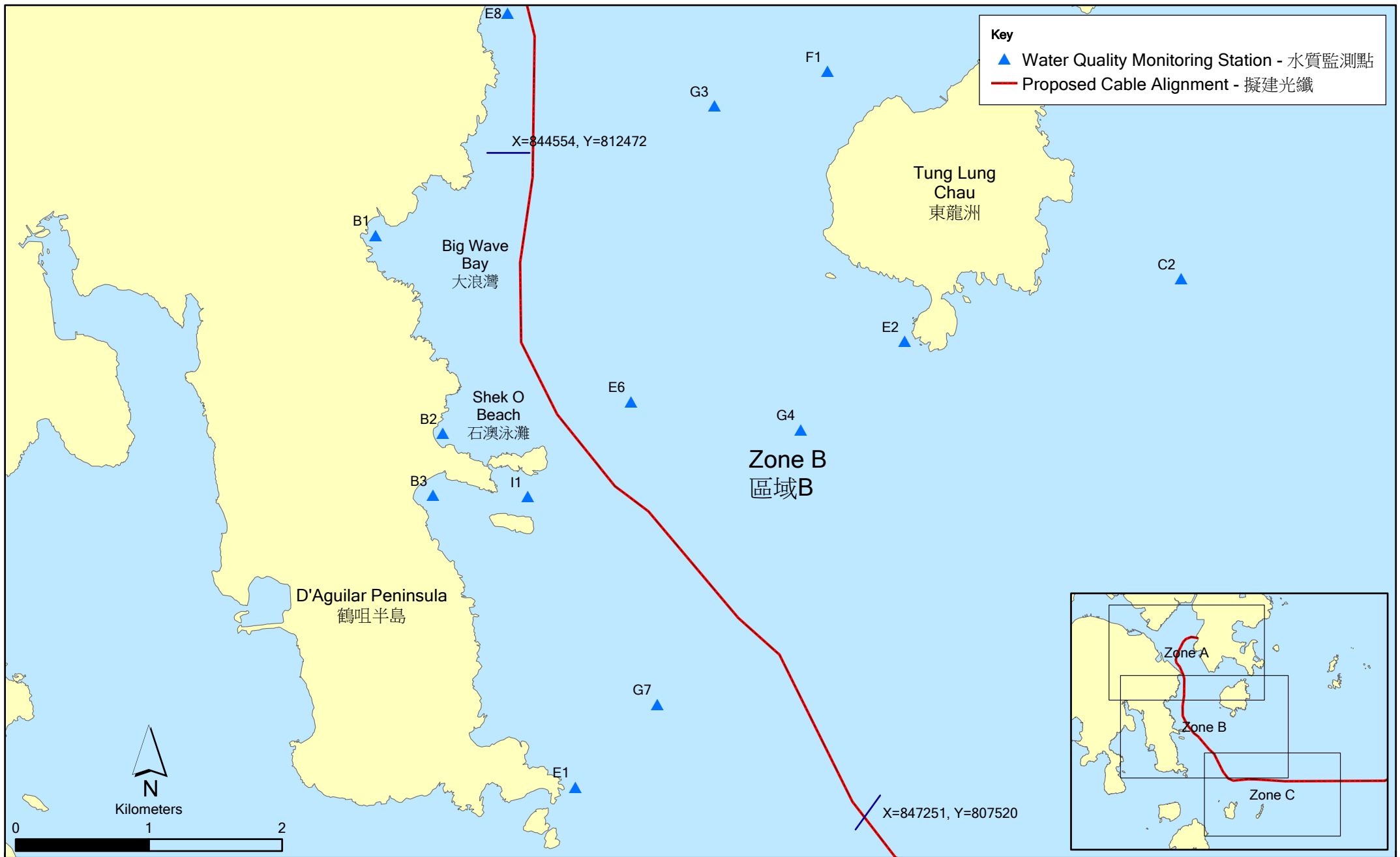


Figure 3.3
圖 3.3

Water Quality Monitoring Station (Zone B)
區域 B 內的水質監測點

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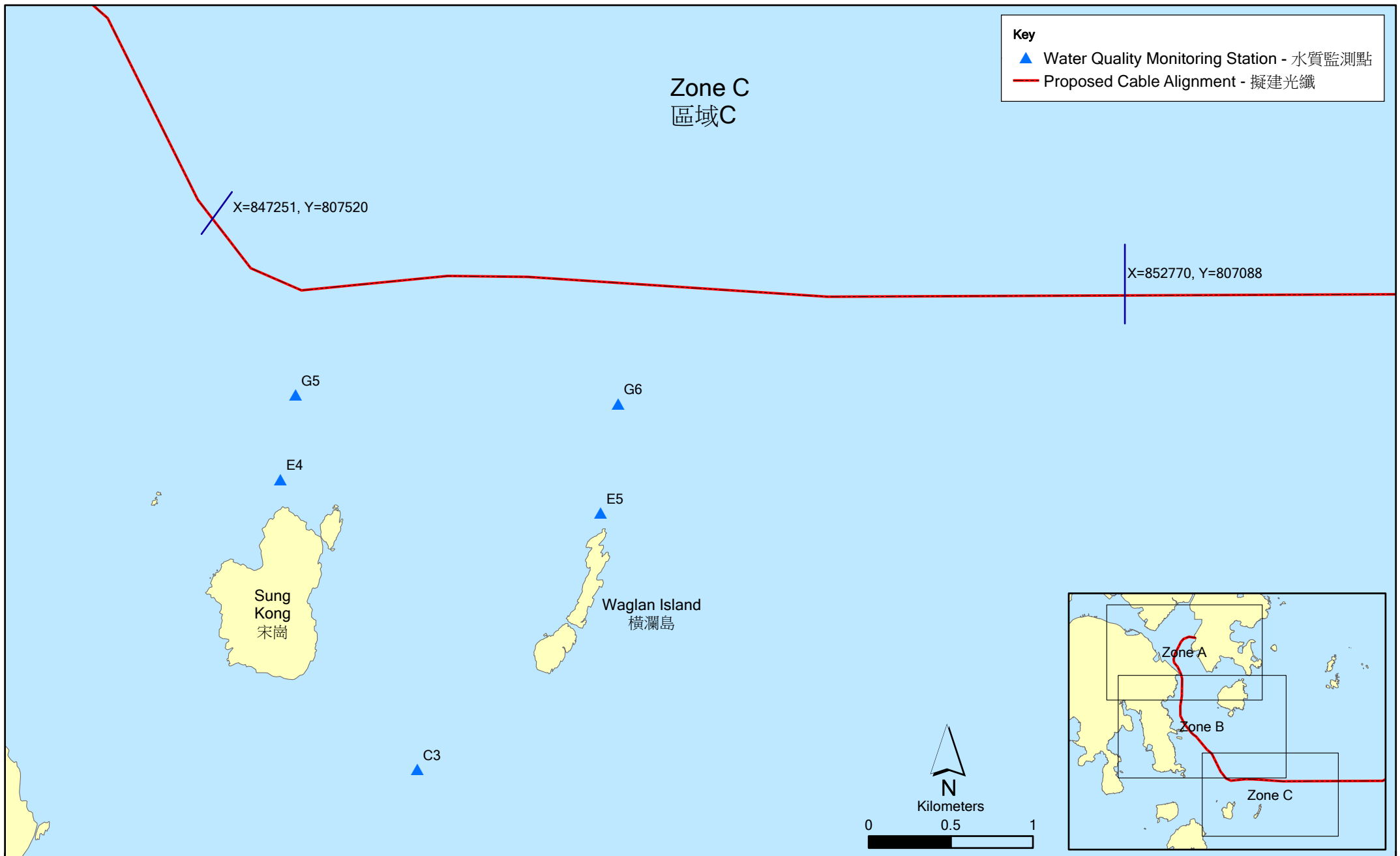


Figure 3.4
圖 3.4

Water Quality Monitoring Station (Zone C)
區域C內的水質監測點

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Table 3.1 **Water Quality Monitoring Stations**

Station	Nature	Easting	Northing
B1	Impact Station (Beach)	843556.84	811853.46
B2	Impact Station (Beach)	844062.02	810369.19
B3	Impact Station (Beach)	843988.33	809902.13
E1	Impact Station (Marine Reserve)	842021.64	816547.02
E2	Impact Station (Coral Communities)	847527.33	811059.83
E4	Impact Station (Coral Communities)	848471.60	804135.73
E5	Impact Station (Coral Communities)	845056.10	807712.89
E6	Impact Station (Coral Communities)	848503.03	811247.01
E7	Impact Station (Coral Communities)	849586.94	805696.09
E8	Impact Station (Coral Communities)	844547.04	813522.78
E9	Impact Station (Coral Communities)	845202.76	815205.38
F1	Impact Station (Fish Culture Zone)	846948.57	813085.03
I1	Impact Station (Site of Special Scientific Interest)	844698.75	809894.80
S1	Impact Station (Seawater Intakes)	845297.24	816281.54
S2	Impact Station (Seawater Intakes)	844070.53	814783.54
S3	Impact Station (Seawater Intakes)	846099.31	812825.53
G1	Gradient Station	847365.06	810245.78
G2	Gradient Station	843936.91	814720.04
G3	Gradient Station	849692.91	806360.59
G4	Gradient Station	846748.01	810394.92
G5	Gradient Station	845320.83	816717.97
G6	Gradient Station	843779.38	814520.41
G7	Gradient Station	843110.53	815125.70
C1	Control Station	842999.91	815984.25
C2	Control Station	845297.24	816281.54
C3	Control Station	844070.53	814783.54

3.2 **MONITORING PARAMETERS**

The parameters measured *in situ* were:

- Dissolved Oxygen (DO) (% saturation and mg/L)
- Water temperature (°C)
- Turbidity (Nephelometric Turbidity Units [NTU])
- Salinity (parts per thousand [ppt])

The only parameter to be measured in the laboratory was:

- Suspended solids (SS) (mg/L)

In addition to the water quality parameters, other relevant data were also measured and recorded in field logs, including the location of the sampling stations, water depth, sampling depth, current velocity and direction, time, weather conditions, sea conditions (where appropriate), tidal state (where appropriate), special phenomena and work activities undertaken around the monitoring and works area that may influence the monitoring results.

These parameters were monitored at all designated marine water quality monitoring stations during the post project monitoring phase.

3.3 *MONITORING EQUIPMENT AND METHODOLOGY*

3.3.1 *Monitoring Equipment*

Table 3.2 summaries the equipment used for the post project water quality monitoring.

Table 3.2 *Equipment used during Post Monitoring*

Equipment	Model
Global Positioning Device	GARMIN eTrex 10
Water Depth Gauge	Speedtech Instruments SM-5
Water Sampling Equipment	Wildlife Supply Co Kemmerer 1520
Salinity, DO, Temperature Measuring Meter	DO and Salinity Meter (Pro 2030)
Current Velocity and Direction	Global Water FP111
Turbidity Meter	HACH 2100Q

3.3.2 *Monitoring Frequency and Timing*

Post monitoring was carried out on three occasions (total six days). Each occasion/round of monitoring was completed in two days; day one at stations B1, C1, C2, S1, S2, S3, E2, E6, E7, E8, E9, F1, G1, G2, G3 (i.e. 15 stations) and day two at stations B3, C3, E1, E4, E5, G4, G5, G6, G7, I1 (i.e. 11 stations). The interval between two sets of monitoring at any given station was no less than 36 hours.

The water quality measurement and sampling were undertaken within a 4-hour window, 2 hours before and 2 hours after mid flood and mid-ebb tides. The tidal range selected for the post monitoring was at least 0.5 m for both flood and ebb tides as far as practicable.

Reference was made to the predicted tides at Tai Miu Wan, which is the tidal station most relevant to the Project Site, published on the website of the Hong Kong Observatory ⁽¹⁾. Based on the predicted tidal levels at Tai Miu Wan tidal station, the post project water quality monitoring was conducted between 13 and 21 June 2016, following the schedule presented in *Annex A*.

3.3.3 *Sampling/ Testing Protocol*

All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or any other international accreditation scheme before use (see calibration reports in *Annex B*), and subsequently will 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.

⁽¹⁾ Hong Kong Observatory (2016) <http://www.hko.gov.hk/tide/predtide.htm?s=TMW> [Accessed in June 2016]

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.

At each measurement/ sampling depth, two (2) consecutive *in-situ* measurements (DO concentration and saturation, temperature, turbidity, and salinity) and two water samples for SS were taken for lab analysis.

3.3.4 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 two (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*)

3.3.5 Sampling Depths & Replication

Each station was sampled and measurements/ 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 was less than 6 m, in which case the mid-depth station was omitted. For stations where the water is less than 3 m deep, only the mid-depth sample was taken.

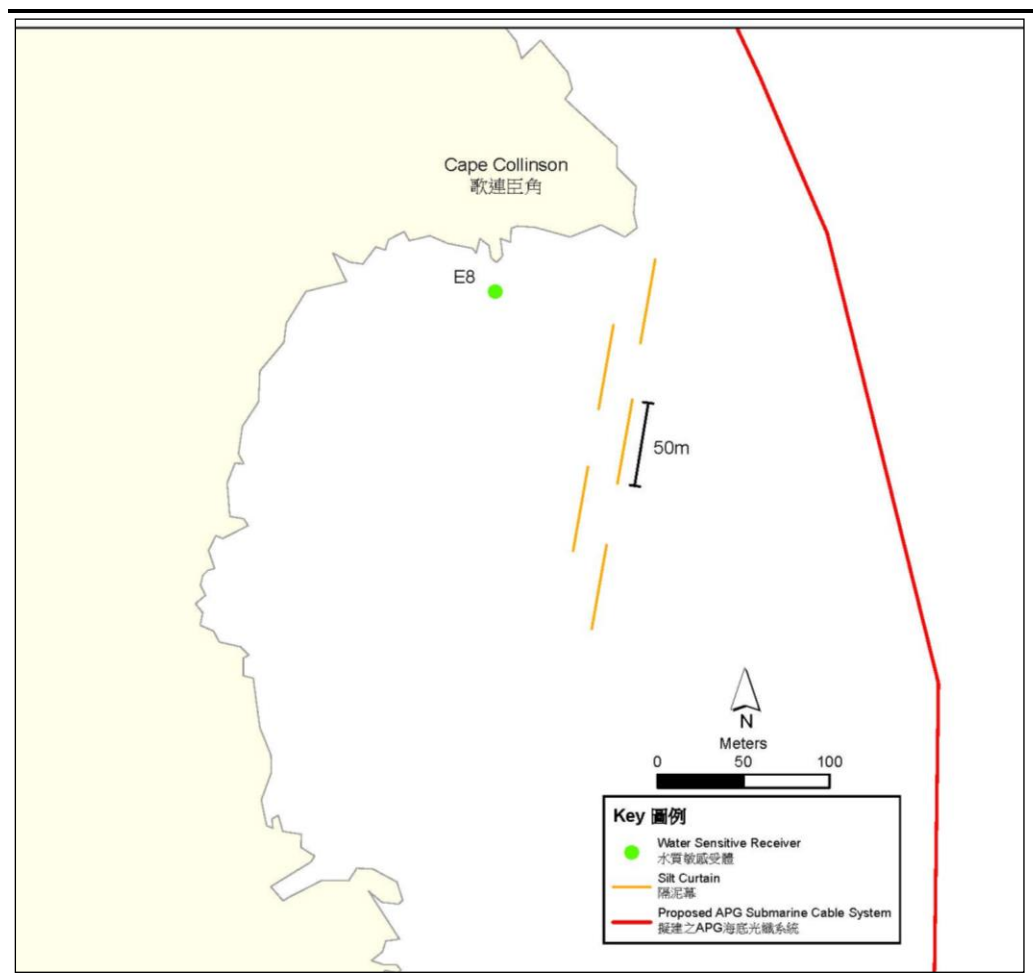
For *in situ* measurements, duplicate readings were made at each water depth at each station. Duplicate water samples were collected at each water depth at each station.

IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

Mitigation measures for water quality control were recommended in the *Project Profile (PP-496/2013)* and *Environmental Permit (EP-485/2014)*. The following selected and relevant mitigation measures were implemented during cable installation works:

- The forward speed of the installation barge was limited to a maximum of 1 km/hour;
- A multi-layer silt curtain was provided as a precautionary measure for the closest water sensitive receiver (WSR) E8 at the south of Cape Collinson (see *Figure 4.1* below)

Figure 4.1 Location of Silt Curtain set up during installation for WSR E8



- The crane barge used for the transport of debris recovered from the seabed during route clearance
 - was fitted with tight bottom seals in order to prevent leakage of material during loading and transport;

- was filled to a level which ensured that material did not spill over during loading and transport to the disposal site; and
- maintained adequate freeboard to ensure that the decks were not washed by wave actions; and
- A Water Quality Monitoring Programme was conducted.

In addition to the above, water quality protection measures during land based cable installation were also incorporated as part of good working practices and these included:

- Stockpiles of materials were covered with tarpaulin or similar fabric to minimise runoff during the rainy season;
- Care was taken during the cable landing and construction to avoid any spillage of materials to the adjacent marine waters and to ensure that spoil materials were not discharged into adjacent waters;
- All construction waste and drainage were handled and disposed of in accordance with the *Waste Disposal Ordinance and Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN1/94)*; and
- Best Management Practices (BMPs) were applied to avoid and minimise contaminated runoff from work sites, marine plants and vessels.

Post project water quality monitoring was conducted between 13 and 21 June 2016 at 26 designated monitoring stations (including 16 Impact Stations, 7 Gradient Stations and 3 Control Stations).

Post monitoring was carried out on three occasions at each location (total six days: 13, 15-17, and 20-21 June 2016), with the interval between two occasions at any one station being no less than 36 hours. Samples were taken at mid-flood and mid-ebb tides, and at three depths (surface, middle and bottom) where practical. On each occasion, monitoring was completed in two days, day one at stations B1, C1, C2, S1, S2, S3, E2, E6, E7, E8, E9, F1, G1, G2, G3 (i.e. 15 Stations) and day two at stations B2, B3, C3, E1, E4, E5, G4, G5, G6, G7, I1 (i.e. 11 Stations).

No major activities influencing the water quality were identified during the post project monitoring period.

The results from the monitoring for water quality in the post monitoring period between 13 and 21 June 2016, and their graphical presentations are included in *Annex D*. The post project monitoring data are also compared with baseline monitoring results in *Figure D1-D9 of Annex D*.

The levels of DO, Turbidity and SS measured during the post project monitoring were slightly different from those obtained during the baseline monitoring period (*Figure D1-D9 of Annex D*) but remained of good quality; during the post project monitoring, DO levels in Zones A to C were still high (levels above 6.7 mg/L during baseline monitoring, and above 6.8 mg/L during post project monitoring) and Turbidity and SS levels in Zones A to C were still low (levels below 3.2 NTU and 3.9 mg/L respectively during baseline monitoring, and below 3.2 NTU and 3.4 mg/L respectively during post project monitoring).

During the post project monitoring, water quality at the impact stations was found to be similar to that at the control stations. It is noted that the control stations are located at sufficient distance from the cable alignment and water quality is unlikely to be affected by the Project works at these locations.

Any overall changes in water quality, represented by DO, Turbidity and SS levels, between the baseline and the post project monitoring period at all designated stations are therefore considered to a reflection of natural background fluctuation.

This *Post Project Water Quality Monitoring Report* presents the EM&A work undertaken during the period from 13 to 21 June 2016 (i.e. 13, 15-17, and 20-21 June 2016) in accordance with the *EM&A Manual* and the requirements under *Environmental Permit (EP-485/2014)*.

Post project water quality monitoring was conducted after the confirmation that the Project marine works (installation and post-lay works) had been completed. The overall water quality in DO, Turbidity and SS in post project monitoring was slightly different to the baseline monitoring results. During the post project monitoring, water quality at the impact stations is found to be similar to that at the control stations. It is noted that the control stations are located at sufficient distance from the cable alignment and water quality at control stations are unlikely to be affected by the Project works. Therefore it is considered that the overall water quality changes in DO, Turbidity and SS levels during the post project monitoring period are considered a reflection of natural background fluctuation.

It is concluded that the Project works had negligible impact on water quality.

Annex A

Post Project Water Quality Monitoring Schedule

Asia Pacific Gateway (APG) - Tseung Kwan O Post Marine Water Quality Monitoring (WQM) Schedule

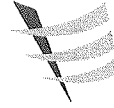
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun
	WQM (Portion 1) Mid-Flood 12:28 (10:28 - 14:28) Mid-Ebb 15:04 (16:58 - 20:58)		WQM (Portion 2) Mid-Ebb 9:32 (07:32 - 11:32) Mid-Flood 15:38 (13:38 - 17:38)	WQM (Portion 1) Mid-Ebb 10:09 (08:09 - 12:09) Mid-Flood 16:33 (14:33 - 18:33)	WQM (Portion 2) Mid-Ebb 10:48 (08:48 - 12:48) Mid-Flood 17:20 (15:20 - 19:20)	
19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun
	WQM (Portion 1) Mid-Ebb 12:11 (10:11 - 14:11) Mid-Flood 19:16 (17:16 - 21:16)	WQM (Portion 2) Mid-Ebb 12:47 (10:47 - 14:47) Mid-Flood 19:53 (17:53 - 21:53)				

Portion 1 : B1, C1, C2, S1, S2, S3, E2, E6, E7, E8, E9, F1, G1, G2, G3 (15 Stations)

Portion 2 : B2, B3, C3, E1, E4, E5, G4, G5, G6, G7, I1 (11 Stations)

Annex B

Calibration Reports of Multi-parameter Sensor



Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/014 Manufacturer : HACH
Model No. : 2100Q Serial No. : 13110C029448
Date of Calibration : 26/05/2016 Due Date : 25/06/2016

Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	20.2	1.00
100	97.6	-2.40
800	778	-2.75

(*) Difference = (Measured Value – Theoretical Value) / Theoretical Value x 100

Acceptance Criteria

Difference : -5 % to 5 %

The turbidity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Prepared by : 

Checked by : 



Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/004</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>10F 101978</u>
Date of Calibration : <u>26/05/2016</u>	Calibration Due Date : <u>25/06/2016</u>

Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/017

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	19.9	Corrected	19.8
DO Meter reading	Measured	20.0	Difference	-0.2

Standardization of sodium thiosulphate (Na₂S₂O₃) solution

Reagent No. of Na ₂ S ₂ O ₃ titrant	CPE/012/4.5/001/13	Reagent No. of 0.025N K ₂ Cr ₂ O ₇	CPE/012/4.4/002/10
		Trial 1	Trial 2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)		0.00	10.20
Final Vol. of Na ₂ S ₂ O ₃ (ml)		10.20	20.50
Vol. of Na ₂ S ₂ O ₃ used (ml)		10.20	10.30
Normality of Na ₂ S ₂ O ₃ solution (N)		0.02451	0.02427
Average Normality (N) of Na ₂ S ₂ O ₃ solution (N)		0.02439	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na₂S₂O₃, N = 0.25 / ml Na₂S₂O₃ used

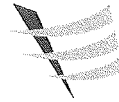
Lineality Checking

Determination of dissolved oxygen content by Winkler Titration *

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	10.90	21.90	0.00	6.80	10.50
Final Vol. of Na ₂ S ₂ O ₃ (ml)	10.90	21.90	28.50	6.80	10.50	14.10
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	10.90	11.00	6.60	6.80	3.70	3.60
Dissolved Oxygen (DO), mg/L	7.14	7.20	4.32	4.45	2.42	2.36
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.42	7.34	7.38	7.14	7.20	7.17	2.89
5	4.56	4.59	4.58	4.32	4.45	4.39	4.24
10	2.35	2.22	2.29	2.42	2.36	2.39	4.27
Linear regression coefficient				0.9987			



Internal Calibration Report of Dissolved Oxygen Meter

Zero Point Checking

DO meter reading, mg/L	0.00
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Salinity Checking

Reagent No. of NaCl (10ppt)	CPE/012/4.7/003/23	Reagent No. of NaCl (30ppt)	CPE/012/4.8/003/23
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*Determination of dissolved oxygen content by Winkler Titration ***

Salinity (ppt)	10		30	
	1	2	1	2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.40	22.90	32.40
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.40	22.90	32.40	42.00
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.40	11.50	9.50	9.60
Dissolved Oxygen (DO), mg/L	7.46	7.53	6.22	6.29
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.31	7.25	7.28	7.46	7.53	7.50	2.98
30	6.45	6.46	6.46	6.22	6.29	6.26	3.14

Acceptance Criteria

- (1) Differenc between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

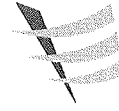
The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / ~~unacceptable~~ # for use.

Delete as appropriate

Calibrated by

:

Approved by :



Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/004 Manufacturer : YSI
Model No. : Pro 2030 Serial No. : 10F 101978
Date of Calibration : 26/05/2016 Due Date : 25/06/2016

Ref. No. of Salinity Standard used (30ppt)

S/001/5



Salinity Standard (ppt)	Measured Salinity (ppt)	Difference * (%)
30.0	30.3	1.00

(*) $\text{Difference (\%)} = (\text{Measured Salinity} - \text{Salinity Standard value}) / \text{Salinity Standard value} \times 100$

Acceptance Criteria

Difference : -10 % to 10 %

The salinity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Checked by :  Approved by : 

Annex C

QA/QC Results for Suspended Solids Testing

QA/QC Results of Laboratory Analysis of Total Suspended Solids

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
6/13/2016	101.8	FB1-S1	7.14	FS1-S2	99.1
	96.9	FS1-M1	0.00	FE2-M2	106.7
	97.1	FE2-B1	0.00	FE8-B2	95.5
	96.5	FE9-S1	3.28	FG2-S2	92.4
	95.8	FG2-M1	0.00	FG3-B2	103.7
	107.5	EB1-S1	6.90	ES1-S2	105.4
	101.7	ES1-M1	3.51	EE2-M2	105.8
	106.6	EE2-B1	3.39	EE8-B2	103.8
	106.0	EE9-S1	3.39	EG2-S2	104.2
101.9	EG2-M1	3.08	EG3-B2	100.3	

Note: (*) % Recovery of QC sample should be between 85.5% to 113.5%.
 (#) % Error of Sample Duplicate should be between 0% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (**) % Error of Sample Duplicate >10% but invalid due to sample results less than MDL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
6/15/2016	93.1	FB2 -S1	0.00	FE1-S2	94.6
	101.6	FE1-M1	0.00	FG4-M2	102.6
	98.9	FG4-B1	3.28	FG7-B2	107.1
	102.3	FI1-S1	6.06	FI1-B2	95.2
	105.5	EB2-S1	4.88	EE1-S2	95.8
	105.3	EE1-M1	0.00	EG4-M2	97.7
	100.0	EG4-B1	3.28	EG7-B2	97.1
	98.7	EI1-S1	8.70	EI1-B2	104.9

Note: (*) % Recovery of QC sample should be between 85.5% to 113.5%.
 (#) % Error of Sample Duplicate should be between 0% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (**) % Error of Sample Duplicate >10% but invalid due to sample results less than MDL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
6/16/2016	102.5	FB1-S1	3.39	FS1-S2	96.8
	98.9	FS1-M1	2.90	FE2-M2	100.6
	107.6	FE2-B1	2.82	FE8-B2	93.6
	104.4	FE9-S1	3.28	FG2-S2	106.2
	104.2	FG2-M1	2.99	FG3-B2	98.8
	97.8	EB1-S1	3.64	ES1-S2	92.2
	93.6	ES1-M1	2.99	EE2-M2	94.5
	96.4	EE2-B1	2.90	EE8-B2	100.7
	104.0	EE9-S1	3.51	EG2-S2	97
105.3	EG2-M1	0.00	EG3-B2	106.6	

Note: (*) % Recovery of QC sample should be between 85.5% to 113.5%.
 (#) % Error of Sample Duplicate should be between 0% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (**) % Error of Sample Duplicate >10% but invalid due to sample results less than MDL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
6/17/2016	92.4	FB2 -S1	0.00	FE1-S2	101.6
	102.9	FE1-M1	4.26	FG4-M2	92.9
	100.7	FG4-B1	3.39	FG7-B2	103.5
	97.9	FI1-S1	7.69	FI1-B2	100.3
	96.4	EB2-S1	3.77	EE1-S2	93.4
	95.9	EE1-M1	4.08	EG4-M2	105.5
	102.7	EG4-B1	6.45	EG7-B2	93.1
	94.3	EI1-S1	6.90	EI1-B2	102.6

Note: (*) % Recovery of QC sample should be between 85.5% to 113.5%.
 (#) % Error of Sample Duplicate should be between 0% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (**) % Error of Sample Duplicate >10% but invalid due to sample results less than MDL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
6/20/2016	100.8	FB1-S1	0.00	FS1-S2	100.4
	108.0	FS1-M1	3.17	FE2-M2	95.4
	107.5	FE2-B1	6.06	FE8-B2	97.3
	107.3	FE9-S1	3.51	FG2-S2	101.8
	95.3	FG2-M1	0.00	FG3-B2	107.4
	103.0	EB1-S1	3.28	ES1-S2	99.2
	94.9	ES1-M1	2.82	EE2-M2	102.6
	93.4	EE2-B1	2.99	EE8-B2	107.3
	97.1	EE9-S1	0.00	EG2-S2	106.2
	107.7	EG2-M1	3.51	EG3-B2	92.6

Note: (*) % Recovery of QC sample should be between 85.5% to 113.5%.
 (#) % Error of Sample Duplicate should be between 0% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (**) % Error of Sample Duplicate >10% but invalid due to sample results less than MDL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
6/21/2016	92.3	FB2 -S1	0.00	FE1-S2	94.0
	107.7	FE1-M1	4.65	FG4-M2	106.5
	100.1	FG4-B1	7.41	FG7-B2	100.7
	98.4	FI1-S1	6.45	FI1-B2	104.8
	93.7	EB2-S1	0.00	EE1-S2	102.8
	106.4	EE1-M1	5.41	EG4-M2	93.5
	92.3	EG4-B1	6.67	EG7-B2	98.1
	104.7	EI1-S1	9.09	EI1-B2	95.8

Note: (*) % Recovery of QC sample should be between 85.5% to 113.5%.
 (#) % Error of Sample Duplicate should be between 0% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (**) % Error of Sample Duplicate >10% but invalid due to sample results less than MDL.

Annex D

Post Project Water Quality Monitoring Results

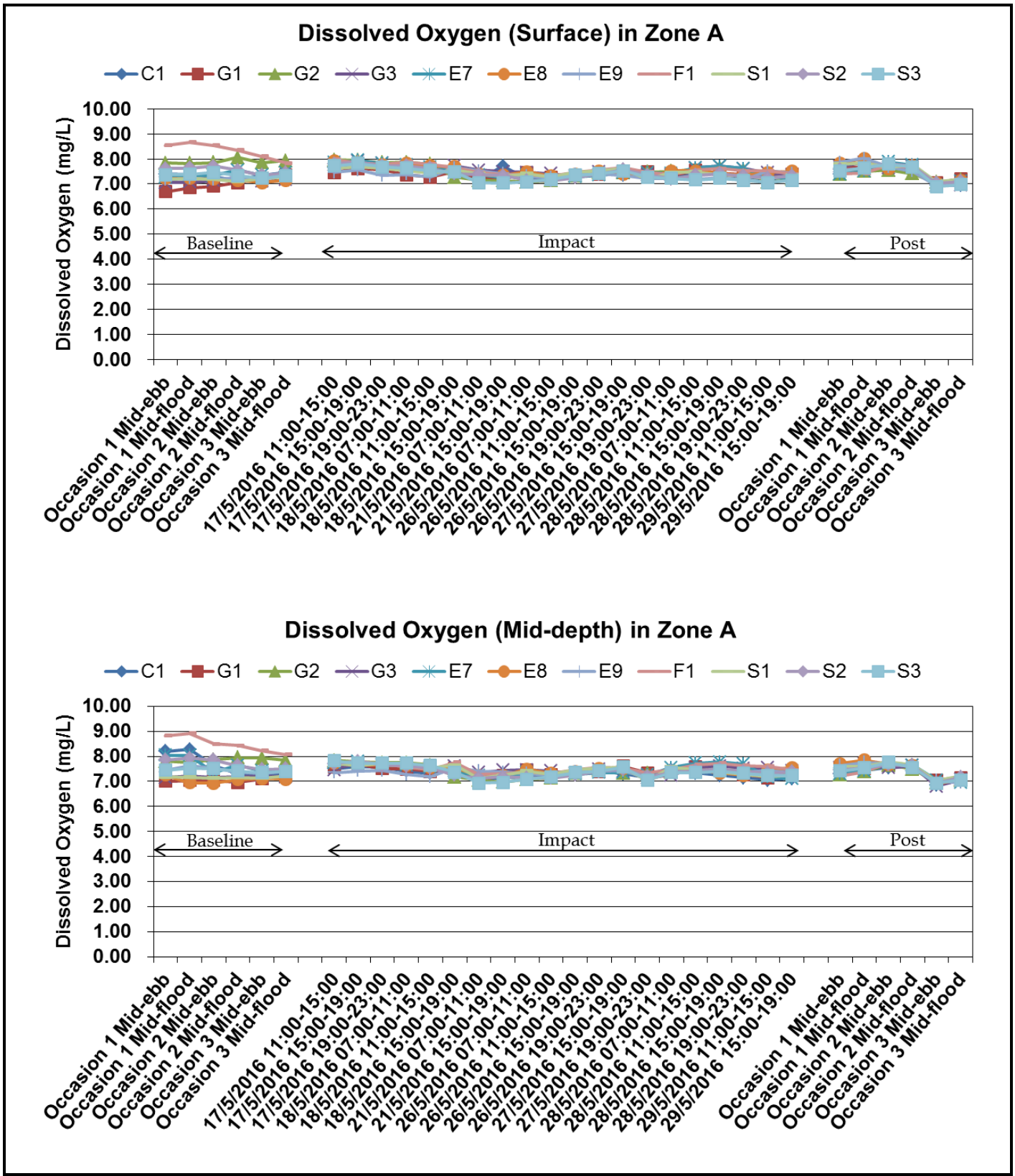


Figure D1 Dissolved oxygen (mg/L) at surface and mid-depth of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone A)

(Baseline monitoring in Zone A was conducted on 28 April, 3 May and 5 May 2016 respectively. Post monitoring in Zone A was conducted on 13, 16 and 20 June 2016 respectively.)



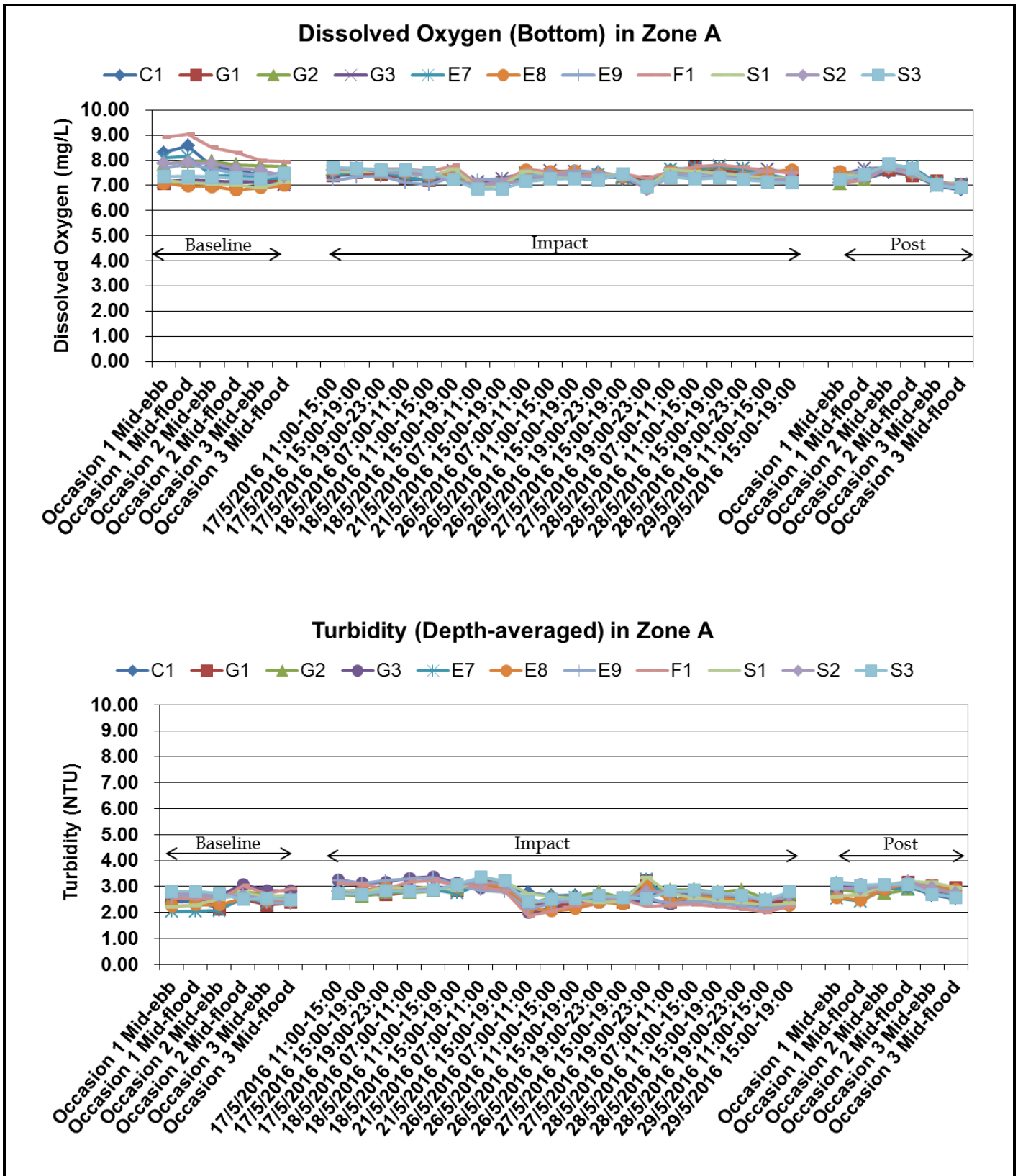


Figure D2 Dissolved oxygen (mg/L) at bottom and depth-averaged turbidity (NTU) of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone A)
 (Baseline monitoring in Zone A was conducted on 28 April, 3 May and 5 May 2016 respectively. Post monitoring in Zone A was conducted on 13, 16 and 20 June 2016 respectively.)



Suspended Solids (Depth-averaged) in Zone A

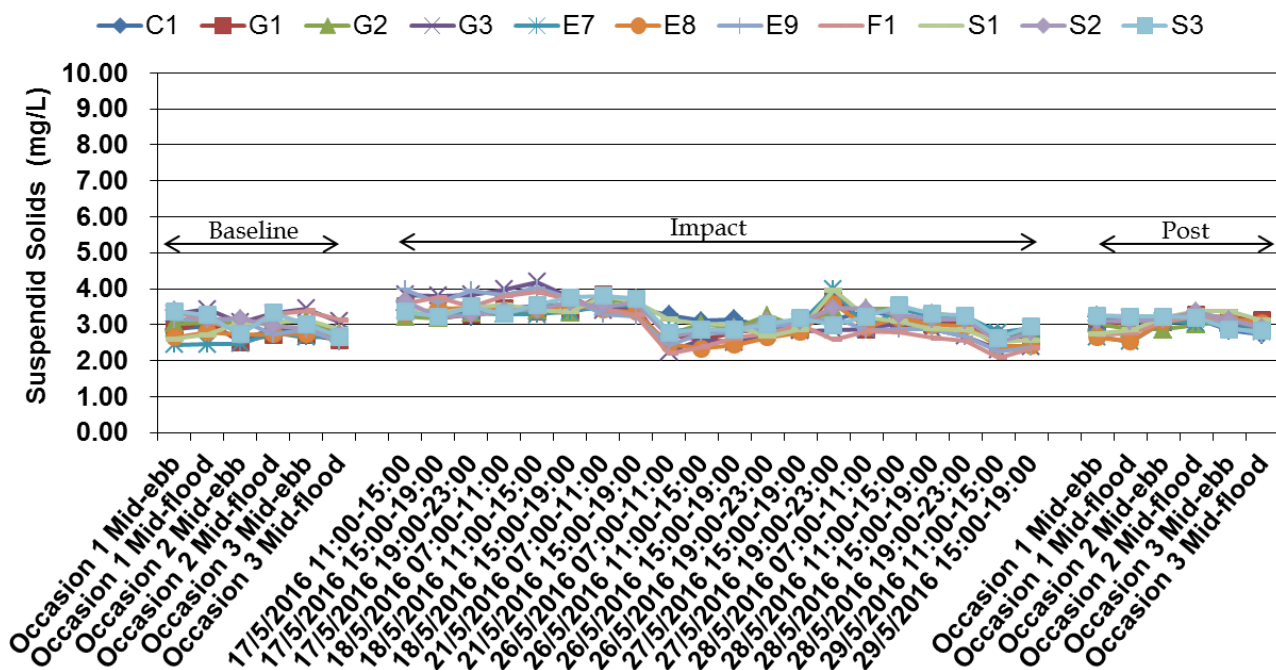


Figure D3 Depth-averaged suspended solids (mg/L) of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone A)

(Baseline monitoring in Zone A was conducted on 28 April, 3 May and 5 May 2016 respectively. Post monitoring in Zone A was conducted on 13, 16 and 20 June 2016 respectively.)



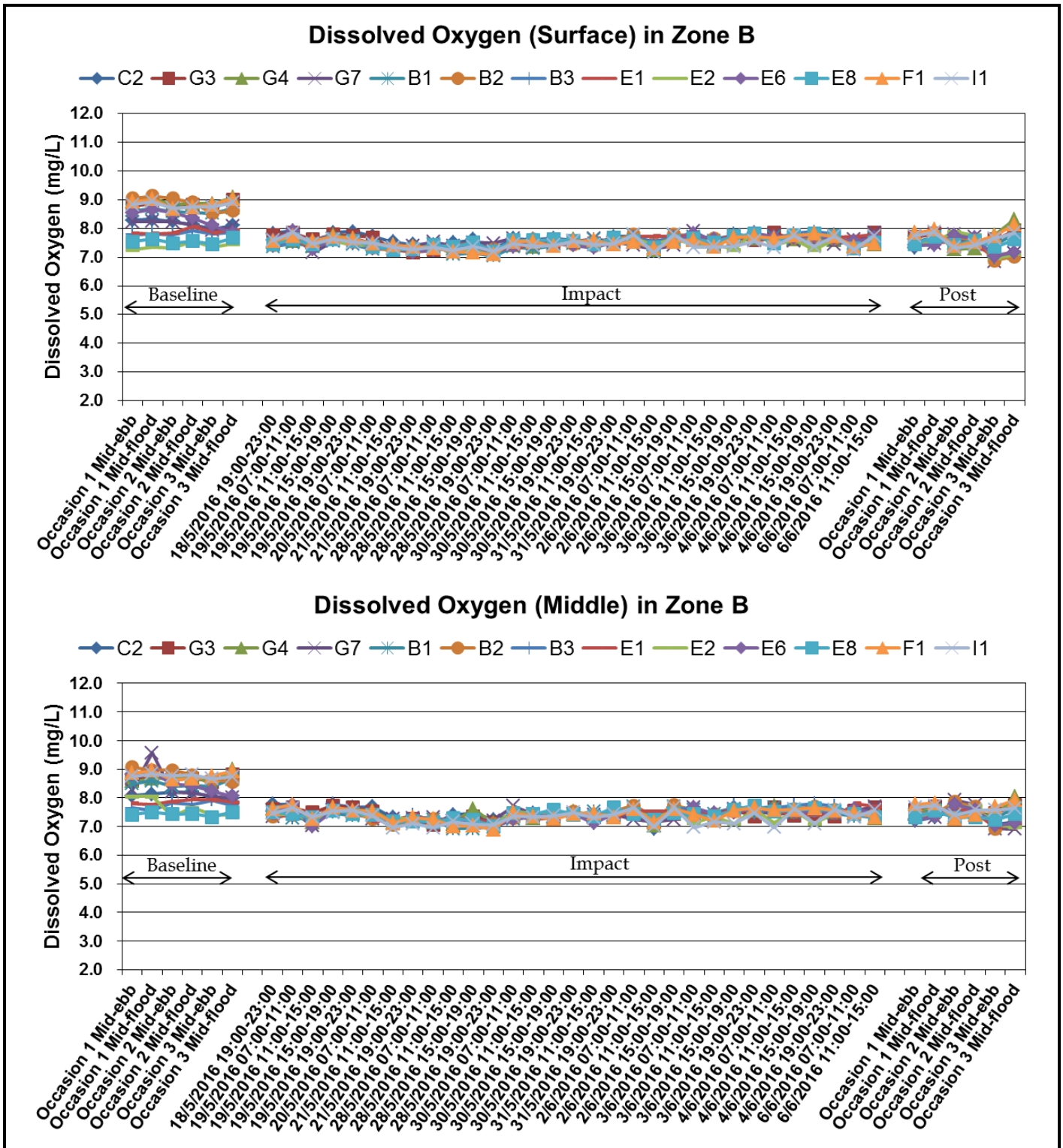


Figure D4 Dissolved oxygen (mg/L) at surface and mid-depth of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone B)
(In Zone B, baseline monitoring was conducted at stations B2, B3, E1, G4, G7 and I1 conducted on 27 April, 29 April and 4 May 2016 respectively, and at stations B1, C2, E2, E6, E8, F1 and G3 on 28 April, 3 May and 5 May 2016 respectively. Post monitoring was conducted at stations B2, B3, E1, G4, G7 and I1 conducted on 15, 17 and 21 June respectively, and at stations B1, C2, E2, E6, E8, F1 and G3 on 13, 16 and 20 June 2016 respectively.)



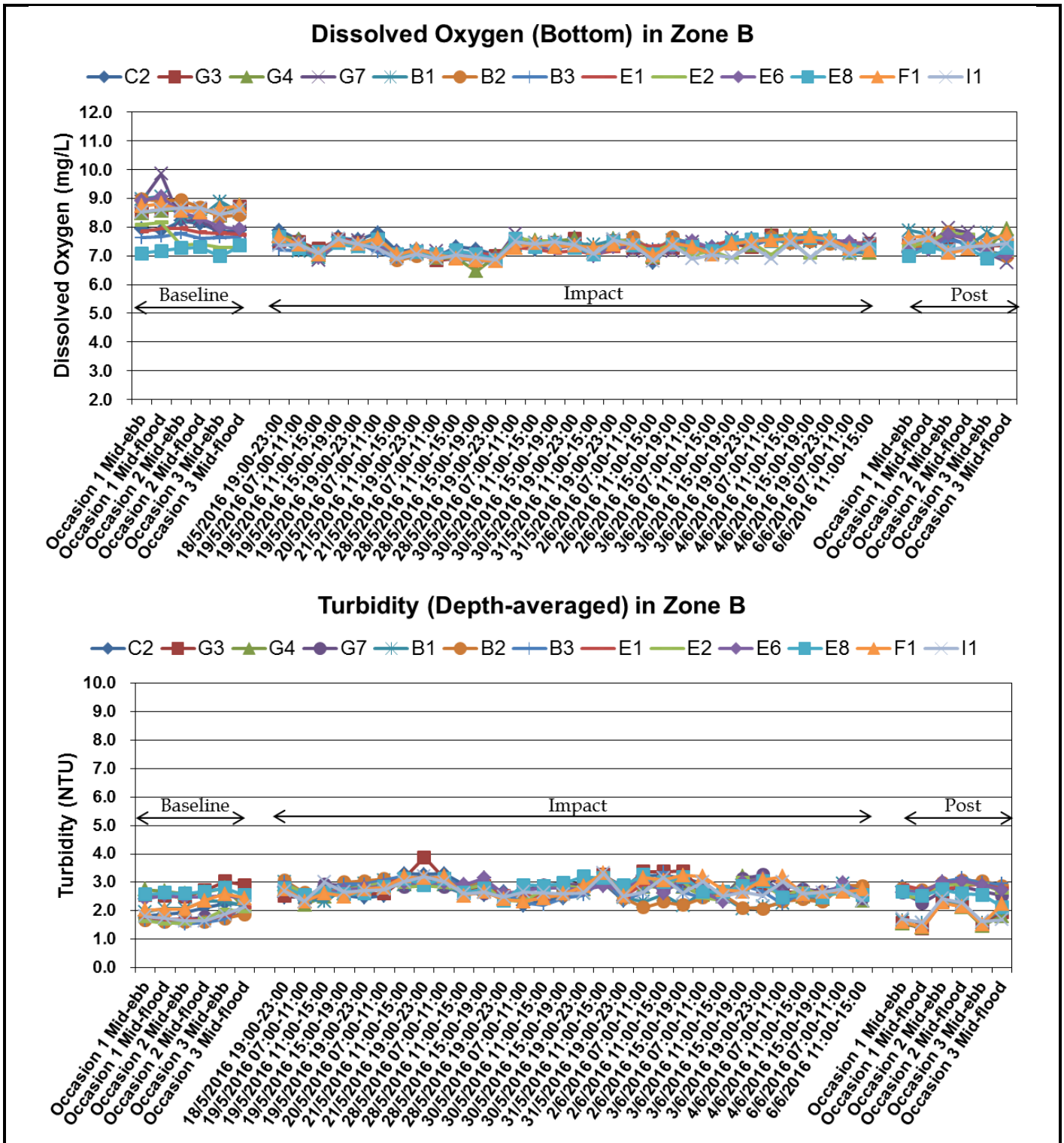


Figure D5 Dissolved oxygen (mg/L) at bottom and depth-averaged turbidity (NTU) of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone B)
(In Zone B, baseline monitoring was conducted at stations B2, B3, E1, G4, G7 and I1 conducted on 27 April, 29 April and 4 May 2016 respectively, and at stations B1, C2, E2, E6, E8, F1 and G3 on 28 April, 3 May and 5 May 2016 respectively. Post monitoring was conducted at stations B2, B3, E1, G4, G7 and I1 conducted on 15, 17 and 21 June respectively, and at stations B1, C2, E2, E6, E8, F1 and G3 on 13, 16 and 20 June 2016 respectively.)



Suspended Solids (Depth-averaged) in Zone B

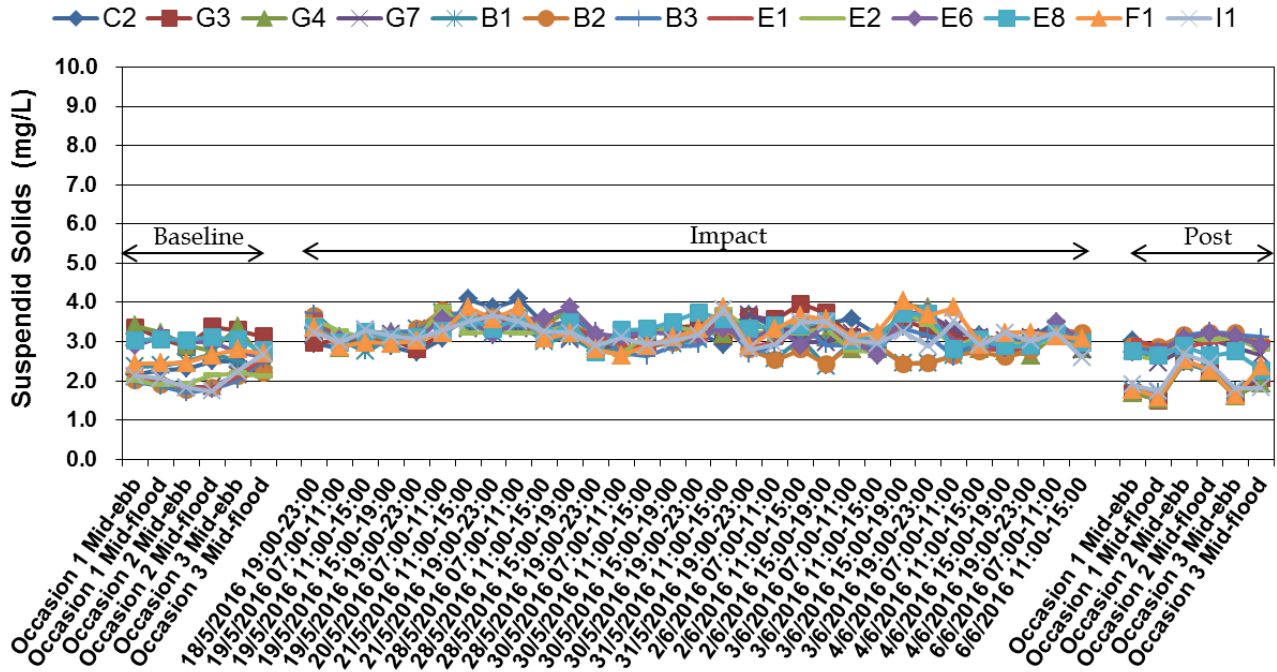


Figure D6 Depth-averaged suspended solids (mg/L) of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone B)

(In Zone B, baseline monitoring was conducted at stations B2, B3, E1, G4, G7 and I1 conducted on 27 April, 29 April and 4 May 2016 respectively, and at stations B1, C2, E2, E6, E8, F1 and G3 on 28 April, 3 May and 5 May 2016 respectively. Post monitoring was conducted at stations B2, B3, E1, G4, G7 and I1 conducted on 15, 17 and 21 June respectively, and at stations B1, C2, E2, E6, E8, F1 and G3 on 13, 16 and 20 June 2016 respectively.)



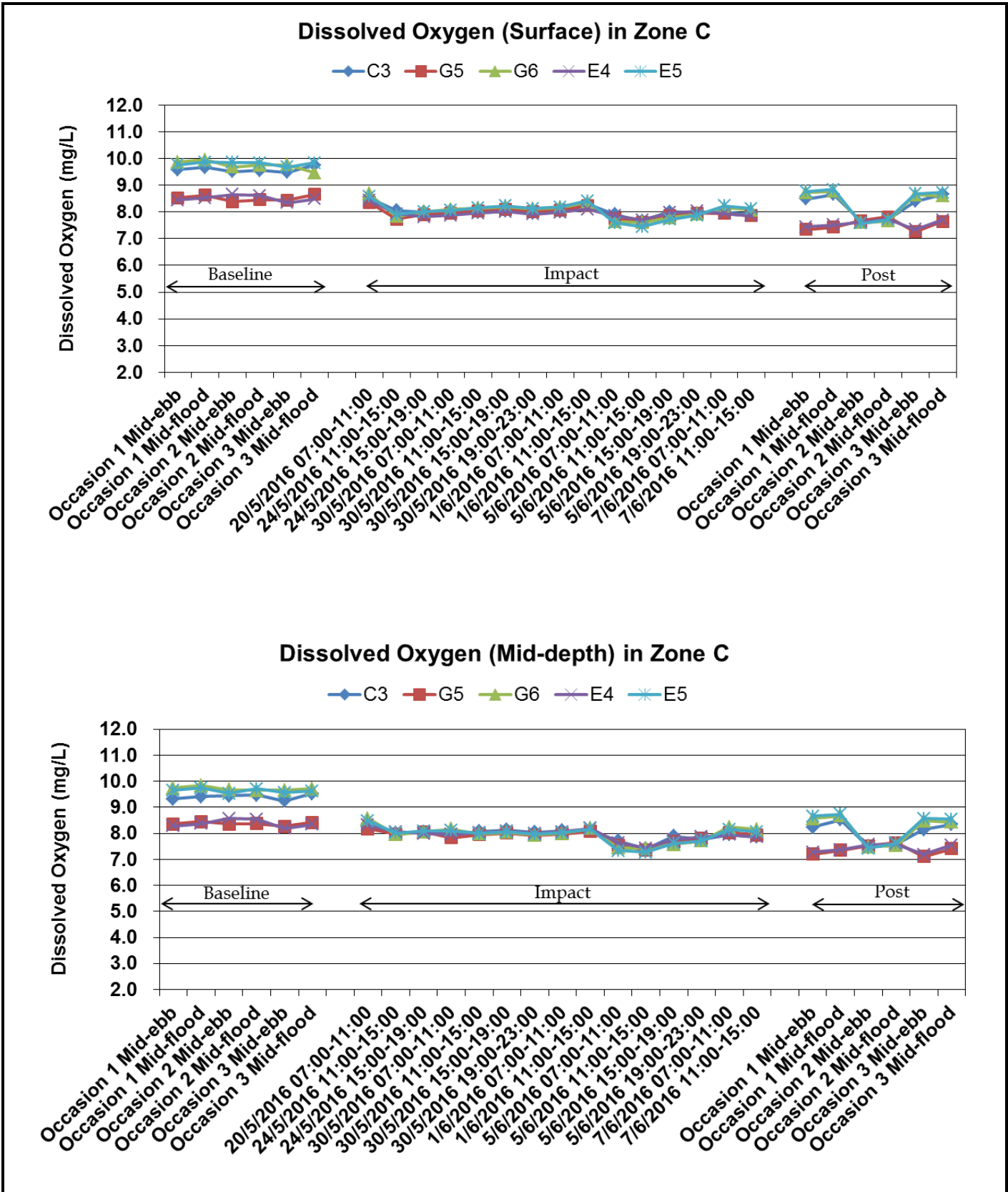
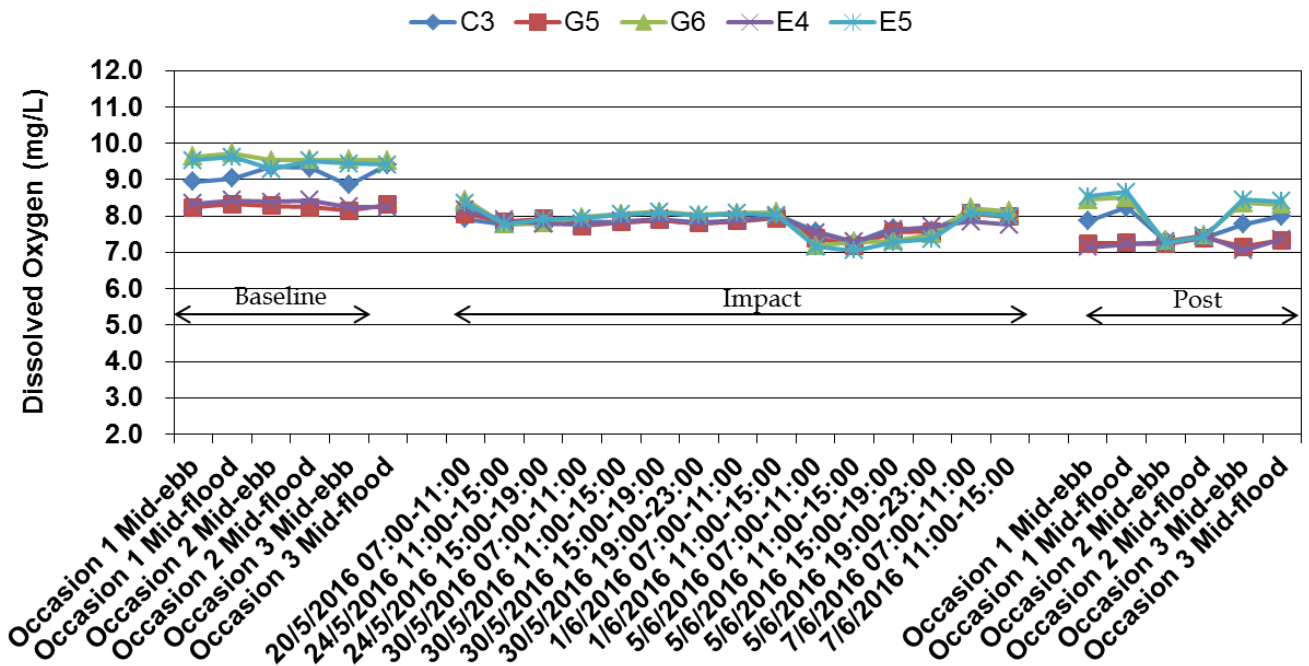


Figure D7 Dissolved oxygen (mg/L) at surface and mid-depth of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone C)
 (Baseline monitoring in Zone C was conducted on 27 April, 29 April and 4 May 2016 respectively. Post monitoring in Zone C was conducted on 15, 17 and 21 June 2016 respectively.)



Dissolved Oxygen (Bottom) in Zone C



Turbidity (Depth-averaged) in Zone C

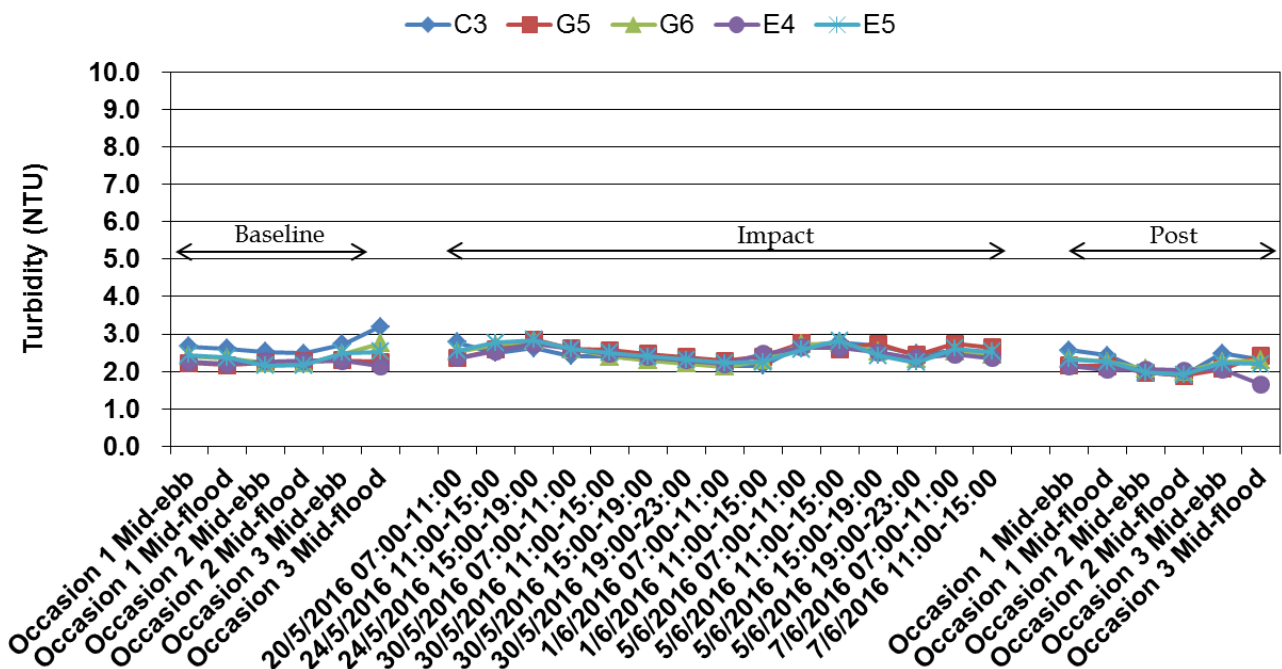


Figure D8 Dissolved oxygen (mg/L) at bottom and depth-averaged turbidity (NTU) of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone C) (Baseline monitoring in Zone C was conducted on 27 April, 29 April and 4 May 2016 respectively. Post monitoring in Zone C was conducted on 15, 17 and 21 June 2016 respectively.)



Suspended Solids (Depth-averaged) in Zone C

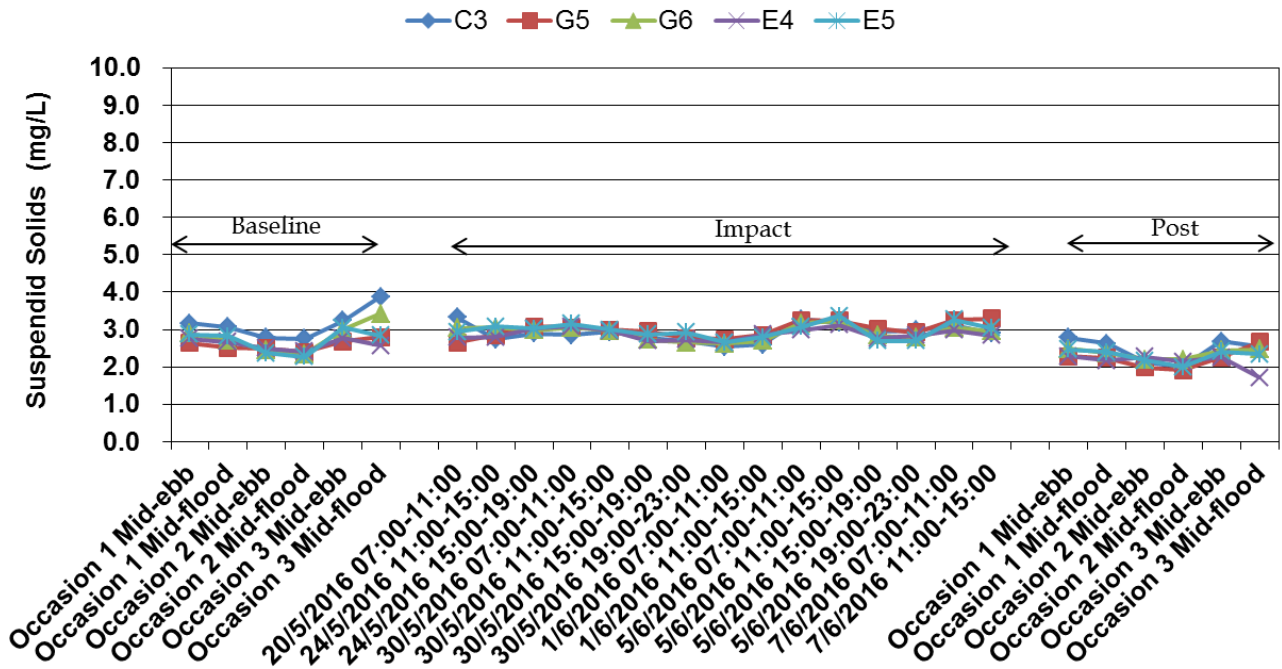


Figure D9 Depth-averaged suspended solids (mg/L) of water column measured throughout baseline and impact monitoring and post monitoring period from 13 to 21 June 2016 (Zone C)
 (Baseline monitoring in Zone C was conducted on 27 April, 29 April and 4 May 2016 respectively. Post monitoring in Zone C was conducted on 15, 17 and 21 June 2016 respectively.)



Date: 15-Jun-16
 Tide: Mid-Ebb
 Weather: Cloudy
 Sea Conditions: Small Wave
 Zone B to C

Location	Sampling Time	Water Depth (m)	Current direction	Current speed (ms ⁻¹)	Monitoring Depth	Temperature (°C)			Salinity (ppt)			DO (mg/l)			DO Saturation (%)			Turbidity (NTU)				Suspended Solids (mg/l)			
						1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	D.A.**	1	2	Ave.*	D.A.**
B2	1103-1117	12.4	W	0.3	Surface	28.8	28.7	28.8	29.0	29.1	29.1	7.7	7.7	7.7	117.3	117.0	117.2	1.8	1.8	1.8	1.6	2.0	1.9	2.0	1.7
					Middle	28.6	28.7	28.7	29.3	29.4	29.4	7.6	7.6	7.6	114.7	115.1	114.9	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7
					Bottom	28.4	28.3	28.4	29.6	29.7	29.7	7.4	7.4	7.4	112.4	112.8	112.6	1.3	1.4	1.4	1.6	1.5	1.5	1.5	1.5
B3	1029-1042	12.6	W	0.2	Surface	28.7	28.6	28.7	29.0	29.1	29.1	7.9	7.9	7.9	119.3	119.5	119.4	1.8	1.7	1.8	1.6	1.9	1.9	1.9	1.7
					Middle	28.6	28.5	28.6	29.3	29.4	29.4	7.5	7.5	7.5	113.5	113.8	113.7	1.5	1.6	1.5	1.6	1.6	1.7	1.7	1.7
					Bottom	28.2	28.3	28.3	29.5	29.4	29.5	7.4	7.4	7.4	111.9	111.5	111.7	1.4	1.4	1.4	1.6	1.5	1.5	1.5	1.5
C3	0904-0917	29.4	W	0.2	Surface	28.6	28.6	28.6	28.9	29.0	29.0	8.5	8.5	8.5	128.8	128.4	128.6	2.9	2.8	2.9	2.6	3.1	3.1	3.1	2.8
					Middle	28.4	28.3	28.4	29.2	29.3	29.3	8.3	8.2	8.2	124.8	124.6	124.7	2.6	2.6	2.6	2.6	2.8	2.8	2.8	2.8
					Bottom	28.1	28.0	28.1	29.5	29.6	29.6	7.9	7.9	7.9	118.4	118.6	118.5	2.3	2.2	2.3	2.6	2.5	2.4	2.5	2.5
E1	0955-1008	23.2	W	0.3	Surface	28.6	28.7	28.7	28.9	29.0	29.0	7.5	7.5	7.5	113.8	114.2	114.0	1.9	1.9	1.9	1.7	2.0	2.0	2.0	1.8
					Middle	28.5	28.4	28.5	29.2	29.1	29.2	7.4	7.4	7.4	112.1	112.2	112.2	1.7	1.6	1.7	2.2	1.8	1.8	1.8	1.8
					Bottom	28.2	28.1	28.2	29.3	29.4	29.4	7.9	7.9	7.9	118.7	119.1	118.9	1.5	1.5	1.5	2.2	1.5	1.6	1.6	1.6
E4	0921-0934	22.4	W	0.2	Surface	28.5	28.6	28.6	28.8	28.9	28.9	7.4	7.3	7.3	111.4	111.0	111.2	2.1	2.2	2.1	2.2	2.2	2.3	2.3	2.3
					Middle	28.3	28.3	28.3	29.1	29.2	29.2	7.2	7.2	7.2	108.9	108.5	108.7	2.4	2.3	2.3	2.2	2.5	2.4	2.5	2.3
					Bottom	28.0	27.9	28.0	29.5	29.4	29.5	7.2	7.3	7.3	109.0	109.3	109.2	2.1	2.0	2.0	2.2	2.2	2.1	2.2	2.2
E5	0847-0901	18.4	W	0.3	Surface	28.4	28.5	28.5	29.0	29.1	29.1	8.7	8.8	8.7	131.4	132.3	131.9	2.3	2.3	2.3	2.3	2.5	2.4	2.5	2.5
					Middle	28.3	28.2	28.3	29.3	29.2	29.3	8.6	8.6	8.6	129.6	129.3	129.5	2.5	2.6	2.6	2.3	2.7	2.7	2.7	2.5
					Bottom	28.0	28.1	28.1	29.4	29.5	29.5	8.4	8.5	8.5	127.0	127.2	127.1	2.2	2.1	2.2	2.6	2.4	2.2	2.3	2.3
G4	1120-1132	24.6	W	0.4	Surface	28.9	28.9	28.9	29.2	29.3	29.3	7.5	7.4	7.5	113.7	113.3	113.5	2.6	2.7	2.7	2.7	2.7	2.8	2.8	2.8
					Middle	28.7	28.6	28.7	29.4	29.5	29.5	7.3	7.3	7.3	111.7	111.3	111.5	2.4	2.4	2.4	2.7	2.5	2.4	2.5	2.8
					Bottom	28.4	28.4	28.4	29.7	29.8	29.8	7.0	7.0	7.0	106.2	105.9	106.1	2.9	3.0	2.9	2.2	3.1	3.1	3.1	2.2
G5	0938-0951	21.8	W	0.2	Surface	28.6	28.5	28.6	29.0	28.9	29.0	7.5	7.4	7.4	113.1	112.7	112.9	2.2	2.3	2.2	2.1	2.3	2.4	2.4	2.4
					Middle	28.3	28.4	28.4	29.2	29.3	29.3	7.3	7.3	7.3	110.1	109.6	109.9	2.2	2.1	2.1	2.1	2.3	2.3	2.3	2.3
					Bottom	28.1	28.1	28.1	29.4	29.4	29.4	7.1	7.2	7.1	107.7	107.8	107.8	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.2
G6	0830-0843	17.6	W	0.2	Surface	28.5	28.4	28.5	29.1	29.0	29.1	8.8	8.8	8.8	133.1	132.9	133.0	2.6	2.5	2.5	2.3	2.7	2.7	2.7	2.7
					Middle	28.2	28.3	28.3	29.2	29.3	29.3	8.7	8.7	8.7	130.8	130.6	130.7	2.3	2.4	2.3	2.3	2.4	2.6	2.5	2.5
					Bottom	28.1	28.1	28.1	29.5	29.4	29.5	8.6	8.5	8.5	129.1	128.7	128.9	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2
G7	1012-1025	23.4	W	0.2	Surface	28.6	28.6	28.6	28.8	28.9	28.9	7.8	7.9	7.8	118.6	118.8	118.7	1.9	1.8	1.8	1.6	2.1	2.0	2.1	1.8
					Middle	28.4	28.3	28.4	29.1	29.2	29.2	7.8	7.8	7.8	117.7	117.5	117.6	1.6	1.6	1.6	1.6	1.7	1.8	1.8	1.8
					Bottom	28.0	27.9	28.0	29.4	29.5	29.5	7.7	7.6	7.6	115.7	115.3	115.5	1.4	1.5	1.4	1.6	1.5	1.6	1.6	1.6
I1	1046-1059	16.8	W	0.3	Surface	28.7	28.8	28.8	28.9	29.0	29.0	7.7	7.8	7.8	117.5	117.7	117.6	2.0	2.0	2.0	1.7	2.2	2.2	2.2	1.9
					Middle	28.5	28.6	28.6	29.2	29.3	29.3	7.7	7.7	7.7	116.2	116.0	116.1	1.7	1.6	1.6	1.6	1.8	1.8	1.8	1.8
					Bottom	28.3	28.2	28.3	29.5	29.6	29.6	7.4	7.4	7.4	112.6	112.3	112.5	1.5	1.6	1.5	1.6	1.7	1.7	1.7	1.7

Remark or Observation:

Note: * Average
 ** Depth Average

Date: 17-Jun-16
Tide: Mid-Flood
Weather: Fine
Sea Conditions: Great Wave
Zone B to C

Location	Sampling Time	Water Depth (m)	Current direction	Current speed (ms ⁻¹)	Monitoring Depth	Temperature (°C)			Salinity (ppt)			DO (mg/l)			DO Saturation (%)			Turbidity (NTU)				Suspended Solids (mg/l)			
						1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	D.A.**	1	2	Ave.*	D.A.**
B2	1539-1554	12.1	E	0.3	Surface	27.2	27.1	27.2	29.2	29.3	29.3	7.5	7.4	7.5	112.1	111.8	112.0	2.2	2.1	2.1			2.3	2.2	2.3
					Middle	27.0	27.1	27.1	29.4	29.3	29.4	7.4	7.3	7.4	108.9	108.6	108.8	2.0	2.1	2.1	2.2	2.1	2.2	2.2	2.3
					Bottom	29.5	29.5	29.5	29.5	29.5	29.5	7.3	7.3	7.3	107.1	106.9	107.0	2.3	2.3	2.3			2.4	2.4	2.4
B3	1619-1634	12.6	E	0.2	Surface	27.2	27.3	27.3	29.3	29.4	29.4	7.3	7.3	7.3	109.9	109.7	109.8	2.0	2.0	2.0			2.1	2.1	2.1
					Middle	27.2	27.1	27.2	29.4	29.3	29.4	7.4	7.4	7.4	109.2	109.6	109.4	2.1	2.2	2.1	2.1	2.1	2.2	2.3	2.3
					Bottom	26.9	26.9	26.9	29.6	29.5	29.6	7.3	7.2	7.3	106.8	106.5	106.7	2.3	2.2	2.2			2.4	2.3	2.4
C3	1803-1821	29.7	E	0.5	Surface	27.3	27.2	27.3	29.3	29.2	29.3	7.7	7.7	7.7	115.3	115.6	115.5	1.7	1.7	1.7			1.9	1.8	1.9
					Middle	26.9	26.9	26.9	29.5	29.6	29.6	7.6	7.6	7.6	112.3	112.1	112.2	2.0	1.9	1.9	1.9	1.9	2.1	2.0	2.1
					Bottom	26.6	26.7	26.7	29.8	29.9	29.9	7.4	7.4	7.4	108.8	108.5	108.7	2.1	2.0	2.0			2.2	2.1	2.2
E1	1701-1715	23.5	E	0.3	Surface	27.3	27.2	27.3	29.2	29.3	29.3	7.6	7.6	7.6	113.5	113.3	113.4	2.2	2.2	2.2			2.4	2.3	2.4
					Middle	27.0	26.9	27.0	29.6	29.5	29.6	7.5	7.4	7.5	110.3	110.1	110.2	2.1	2.1	2.1	2.2	2.3	2.3	2.3	
					Bottom	26.7	26.7	26.7	29.8	29.8	29.8	7.4	7.3	7.4	108.4	108.0	108.2	2.3	2.4	2.4			2.1	2.3	2.2
E4	1741-1757	22.8	E	0.4	Surface	27.3	27.4	27.4	29.3	29.4	29.4	7.8	7.8	7.8	116.9	117.2	117.1	1.9	1.8	1.8			2.0	1.9	2.0
					Middle	27.1	27.0	27.1	29.5	29.6	29.6	7.7	7.6	7.6	113.1	112.8	113.0	1.6	1.7	1.7	1.9	1.9	2.0	2.0	2.0
					Bottom	26.8	26.7	26.8	29.9	29.8	29.9	7.4	7.4	7.4	108.8	108.4	108.6	2.1	2.2	2.2			1.8	1.8	1.8
E5	1826-1844	18.5	E	0.6	Surface	27.2	27.3	27.3	29.3	29.4	29.4	7.7	7.7	7.7	114.6	114.8	114.7	2.0	2.1	2.0			2.3	2.3	2.3
					Middle	27.1	27.0	27.1	29.5	29.4	29.5	7.5	7.5	7.5	111.1	111.2	111.2	1.9	1.9	1.9	2.0	2.2	2.3	2.3	
					Bottom	26.8	26.8	26.8	29.6	29.7	29.7	7.5	7.5	7.5	109.4	109.7	109.6	2.0	2.1	2.0			2.1	2.0	2.1
G4	1520-1534	20.4	E	0.4	Surface	27.2	27.3	27.3	29.3	29.2	29.3	7.6	7.6	7.6	113.2	113.5	113.4	2.6	2.6	2.6			2.1	2.2	2.2
					Middle	27.1	27.0	27.1	29.5	29.4	29.5	7.3	7.3	7.3	108.5	108.1	108.3	2.5	2.4	2.5	2.6	2.8	2.9	2.9	
					Bottom	26.8	26.7	26.8	29.7	29.6	29.7	7.3	7.3	7.3	106.6	106.3	106.5	2.8	2.7	2.7			3.0	2.8	2.9
G5	1721-1736	22.2	E	0.4	Surface	27.2	27.1	27.2	29.1	29.2	29.2	7.7	7.7	7.7	115.8	115.9	115.9	1.8	1.9	1.9			1.9	2.0	2.0
					Middle	26.9	26.8	26.9	29.5	29.4	29.5	7.6	7.6	7.6	112.0	112.1	112.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	
					Bottom	26.7	26.6	26.7	29.5	29.6	29.6	7.5	7.5	7.5	109.7	109.5	109.6	2.2	2.3	2.2			2.3	2.4	2.4
G6	1850-1908	17.7	E	0.6	Surface	27.2	27.1	27.2	29.1	29.2	29.2	7.7	7.7	7.7	115.6	115.4	115.5	1.9	1.8	1.8			1.9	1.9	1.9
					Middle	27.0	27.0	27.0	29.3	29.2	29.3	7.6	7.6	7.6	112.9	112.6	112.8	1.9	1.9	1.9	1.9	2.1	1.9	2.0	
					Bottom	26.8	26.7	26.8	29.6	29.5	29.6	7.4	7.4	7.4	109.1	108.9	109.0	2.0	2.0	2.0			2.1	2.1	2.1
G7	1641-1657	23.6	E	0.5	Surface	27.3	27.2	27.3	29.2	29.3	29.3	7.6	7.5	7.5	113.1	112.7	112.9	2.1	2.1	2.1			2.3	2.2	2.3
					Middle	26.9	27.0	27.0	29.5	29.4	29.5	7.4	7.4	7.4	109.8	109.5	109.7	2.0	2.1	2.0	2.1	2.1	2.1	2.1	
					Bottom	26.7	26.6	26.7	29.7	29.8	29.8	7.2	7.3	7.2	106.1	106.4	106.3	2.3	2.3	2.3			2.4	2.5	2.5
I1	1601-1615	11.8	E	0.3	Surface	27.2	27.1	27.2	29.3	29.2	29.3	7.4	7.4	7.4	110.9	111.0	111.0	2.3	2.2	2.3			2.5	2.4	2.5
					Middle	27.1	27.0	27.1	29.3	29.2	29.3	7.6	7.6	7.6	112.0	111.8	111.9	2.2	2.1	2.1	2.3	2.3	2.3	2.3	
					Bottom	26.9	27.0	27.0	29.4	29.5	29.5	7.3	7.3	7.3	107.5	107.3	107.4	2.4	2.4	2.4			2.6	2.5	2.6

Remark or Observation:

Note: * Average

** Depth Average

Date: 17-Jun-16
 Tide: Mid-Ebb
 Weather: Cloudy
 Sea Conditions: Great Wave
 Zone B to C

Location	Sampling Time	Water Depth (m)	Current direction	Current speed (ms ⁻¹)	Monitoring Depth	Temperature (°C)			Salinity (ppt)			DO (mg/l)			DO Saturation (%)			Turbidity (NTU)				Suspended Solids (mg/l)			
						1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	D.A.**	1	2	Ave.*	D.A.**
B2	0907-0920	11.8	E	0.2	Surface	27.1	27.2	27.2	29.1	29.2	29.2	7.4	7.4	7.4	110.0	110.4	110.2	2.4	2.3	2.3	2.3	2.6	2.4	2.5	
					Middle	27.1	27.1	27.1	29.2	29.2	29.2	7.4	7.5	7.4	109.2	109.6	109.4	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.5
					Bottom	26.9	26.9	26.9	29.4	29.4	29.4	7.2	7.2	7.2	106.1	105.6	105.9	2.5	2.6	2.5		2.7	2.8	2.8	
B3	0942-0956	12.4	E	0.2	Surface	27.2	27.1	27.2	29.2	29.3	29.3	7.3	7.3	7.3	108.5	108.9	108.7	2.3	2.1	2.2	2.3	2.5	2.3	2.4	
					Middle	27.1	27.1	27.1	29.3	29.3	29.3	7.4	7.3	7.3	108.1	107.4	107.8	2.3	2.2	2.3	2.3	2.5	2.4	2.5	2.5
					Bottom	26.8	26.8	26.8	29.4	29.4	29.4	7.1	7.2	7.2	104.8	105.2	105.0	2.4	2.5	2.5		2.6	2.7	2.7	
C3	1126-1142	29.5	E	0.6	Surface	27.2	27.2	27.2	29.2	29.3	29.3	7.6	7.7	7.6	114.0	114.5	114.3	1.8	1.8	1.8	2.0	2.0	1.9	2.0	
					Middle	26.8	26.7	26.8	29.5	29.5	29.5	7.5	7.5	7.5	110.1	110.5	110.3	2.1	2.1	2.1	2.0	2.2	2.3	2.3	2.1
					Bottom	26.5	26.5	26.5	29.7	29.7	29.7	7.4	7.3	7.3	107.8	107.1	107.5	2.0	2.1	2.0		2.1	2.2	2.2	
E1	1020-1033	23.4	E	0.2	Surface	27.1	27.2	27.2	29.1	29.2	29.2	7.5	7.5	7.5	111.5	111.9	111.7	2.3	2.4	2.3	2.4	2.5	2.5	2.5	
					Middle	26.8	26.7	26.8	29.4	29.5	29.5	7.4	7.4	7.4	108.7	108.2	108.5	2.1	2.2	2.2	2.4	2.4	2.6	2.5	2.5
					Bottom	26.5	26.4	26.5	29.7	29.7	29.7	7.1	7.2	7.2	104.8	105.2	105.0	2.6	2.6	2.6		2.3	2.4	2.4	
E4	1100-1117	22.6	E	0.4	Surface	27.2	27.1	27.2	29.2	29.2	29.2	7.7	7.7	7.7	114.8	114.4	114.6	1.9	1.9	1.9	2.0	2.0	2.1	2.1	
					Middle	26.8	26.7	26.8	29.4	29.3	29.4	7.5	7.5	7.5	110.7	110.4	110.6	1.8	1.8	1.8	2.0	2.0	2.0	2.0	2.0
					Bottom	26.4	26.5	26.5	29.6	29.7	29.7	7.3	7.2	7.2	106.4	105.8	106.1	2.2	2.2	2.2		1.9	1.9	1.9	
E5	1150-1206	18.3	E	0.5	Surface	27.2	27.2	27.2	29.2	29.2	29.2	7.6	7.6	7.6	113.7	113.3	113.5	2.0	2.0	2.0	2.1	2.3	2.4	2.4	
					Middle	27.0	26.9	27.0	29.3	29.4	29.4	7.5	7.5	7.5	110.4	109.9	110.2	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.2
					Bottom	26.6	26.7	26.7	29.6	29.6	29.6	7.3	7.3	7.3	107.3	107.6	107.5	2.1	2.2	2.2		2.2	2.2	2.2	
G4	0848-0901	20.2	E	0.4	Surface	27.1	27.0	27.1	29.2	29.2	29.2	7.4	7.4	7.4	111.0	110.6	110.8	2.8	2.8	2.8	2.7	3.0	2.9	3.0	
					Middle	26.7	26.7	26.7	29.4	29.3	29.4	7.3	7.3	7.3	107.2	107.6	107.4	2.6	2.5	2.5	2.7	2.7	2.6	2.7	2.9
					Bottom	26.5	26.6	26.6	29.6	29.6	29.6	7.1	7.2	7.2	104.8	105.2	105.0	2.8	3.0	2.9		3.0	3.1	3.1	
G5	1040-1054	22.0	E	0.5	Surface	27.2	27.2	27.2	29.1	29.2	29.2	7.6	7.6	7.6	114.2	113.6	113.9	2.0	2.0	2.0	2.1	2.2	2.3	2.3	
					Middle	26.7	26.8	26.8	29.4	29.4	29.4	7.6	7.5	7.6	111.5	110.9	111.2	1.9	1.8	1.8	2.1	2.1	2.0	2.1	2.3
					Bottom	26.6	26.5	26.6	29.6	29.6	29.6	7.3	7.3	7.3	106.8	107.3	107.1	2.3	2.3	2.3		2.5	2.5	2.5	
G6	1212-1228	17.4	E	0.5	Surface	27.2	27.2	27.2	29.1	29.2	29.2	7.6	7.6	7.6	112.8	113.3	113.1	2.0	1.9	2.0	2.0	2.2	2.1	2.2	
					Middle	26.9	27.0	27.0	29.3	29.4	29.4	7.4	7.4	7.4	109.2	109.5	109.4	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.2
					Bottom	26.7	26.7	26.7	29.6	29.5	29.6	7.3	7.2	7.3	106.8	106.3	106.6	2.0	2.1	2.1		2.2	2.3	2.3	
G7	1002-1016	23.5	E	0.4	Surface	27.2	27.2	27.2	29.2	29.0	29.1	7.4	7.4	7.4	110.6	110.0	110.3	2.2	2.3	2.2	2.3	2.4	2.5	2.5	
					Middle	26.8	26.8	26.8	29.3	29.4	29.4	7.3	7.3	7.3	107.1	106.7	106.9	2.1	2.2	2.1	2.3	2.3	2.4	2.4	2.5
					Bottom	26.5	26.5	26.5	29.6	29.7	29.7	7.1	7.1	7.1	104.1	104.3	104.2	2.5	2.6	2.5		2.8	2.8	2.8	
I1	0924-0937	11.6	E	0.2	Surface	27.1	27.1	27.1	29.2	29.2	29.2	7.3	7.3	7.3	109.2	109.7	109.5	2.6	2.4	2.5	2.4	2.8	2.7	2.8	
					Middle	27.1	27.0	27.1	29.2	29.3	29.3	7.4	7.4	7.4	109.2	108.9	109.1	2.3	2.3	2.3	2.4	2.6	2.5	2.6	2.7
					Bottom	26.8	26.9	26.9	29.4	29.5	29.5	7.2	7.2	7.2	105.5	105.8	105.7	2.5	2.5	2.5		2.8	2.7	2.8	

Remark or Observation:

Note: * Average
 ** Depth Average

Date: 21-Jun-16
 Tide: Mid-Flood
 Weather: Fine
 Sea Conditions: Small Wave
 Zone B to C

Location	Sampling Time	Water Depth (m)	Current direction	Current speed (ms ⁻¹)	Monitoring Depth	Temperature (°C)			Salinity (ppt)			DO (mg/l)			DO Saturation (%)			Turbidity (NTU)				Suspended Solids (mg/l)						
						1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	D.A.**	1	2	Ave.*	D.A.**			
B2	2117-2134	12.5	W	0.3	Surface	27.1	27.0	27.1	27.9	28.0	28.0	7.9	7.9	7.9	116.5	116.3	116.4	1.8	1.8	1.8					1.9	1.9	1.9	
					Middle	26.9	26.8	26.9	28.1	28.2	28.2	7.8	7.7	7.7	113.5	113.3	113.4	1.9	2.0	1.9	2.0	2.0	2.1	2.1	2.1			
					Bottom	26.7	26.6	26.7	28.3	28.4	28.4	7.3	7.4	7.4	107.3	107.5	107.4	2.2	2.1	2.1					2.3	2.3	2.3	
B3	2029-2047	12.7	W	0.4	Surface	26.9	27.0	27.0	27.9	27.9	27.9	8.3	8.3	8.3	122.2	122.0	122.1	1.6	1.6	1.6					1.7	1.7	1.7	
					Middle	26.8	26.7	26.8	28.0	28.1	28.1	8.1	8.0	8.0	117.9	117.7	117.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9			
					Bottom	26.5	26.6	26.6	28.3	28.4	28.4	7.9	7.9	7.9	115.8	116.1	116.0	2.1	2.1	2.1					2.2	2.2	2.2	
C3	1839-1856	29.4	W	0.3	Surface	26.9	26.8	26.9	28.1	28.2	28.2	8.7	8.6	8.7	127.1	127.3	127.2	2.0	2.0	2.0					2.2	2.2	2.2	
					Middle	26.7	26.6	26.7	28.3	28.4	28.4	8.3	8.4	8.4	122.2	122.4	122.3	2.4	2.4	2.4	2.3	2.6	2.6	2.6	2.5			
					Bottom	26.5	26.5	26.5	28.5	28.5	28.5	8.0	8.0	8.0	116.8	117.0	116.9	2.6	2.6	2.6					2.8	2.8	2.8	
E1	1945-1959	22.8	W	0.3	Surface	26.9	27.0	27.0	28.0	28.1	28.1	7.8	7.8	7.8	114.7	114.5	114.6	1.8	1.8	1.8					2.0	2.0	2.0	
					Middle	26.8	26.7	26.8	28.3	28.3	28.3	7.6	7.7	7.6	111.7	111.9	111.8	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2			
					Bottom	26.6	26.5	26.6	28.4	28.5	28.5	7.4	7.5	7.5	108.8	109.0	108.9	2.3	2.4	2.3					2.4	2.5	2.5	
E4	1901-1918	22.5	W	0.3	Surface	27.1	27.1	27.1	28.0	28.0	28.0	7.6	7.7	7.6	112.0	112.2	112.1	2.2	2.3	2.3					2.5	2.5	2.5	
					Middle	27.0	26.9	27.0	28.1	28.2	28.2	7.4	7.4	7.4	108.7	108.5	108.6	2.4	2.4	2.4	2.4	2.6	2.6	2.6	2.7			
					Bottom	26.7	26.6	26.7	28.3	28.4	28.4	7.4	7.3	7.3	107.5	107.3	107.4	2.6	2.7	2.6					2.9	2.9	2.9	
E5	1815-1833	18.3	W	0.4	Surface	27.0	26.9	27.0	28.0	28.1	28.1	8.6	8.6	8.6	126.1	126.3	126.2	2.1	2.2	2.2					2.3	2.3	2.3	
					Middle	26.8	26.7	26.8	28.2	28.3	28.3	8.4	8.4	8.4	123.4	123.6	123.5	2.3	2.3	2.3	2.3	2.5	2.5	2.5	2.5			
					Bottom	26.6	26.5	26.6	28.4	28.5	28.5	8.3	8.3	8.3	121.5	121.7	121.6	2.5	2.4	2.4					2.6	2.6	2.6	
G4	2138-2153	24.7	W	0.3	Surface	26.9	27.0	27.0	28.0	28.0	28.0	7.6	7.6	7.6	112.0	111.8	111.9	1.8	1.9	1.9					2.0	2.0	2.0	
					Middle	26.8	26.7	26.8	28.1	28.2	28.2	7.4	7.4	7.4	108.8	108.6	108.7	2.2	2.2	2.2	2.1	2.3	2.2	2.3	2.3			
					Bottom	26.6	26.5	26.6	28.3	28.4	28.4	7.3	7.3	7.3	106.2	106.5	106.4	2.4	2.4	2.4					2.6	2.5	2.6	
G5	1923-1940	21.4	W	0.3	Surface	27.1	27.0	27.1	28.0	27.9	28.0	7.7	7.7	7.7	112.8	113.1	113.0	1.5	1.5	1.5					1.5	1.6	1.6	
					Middle	26.8	26.7	26.8	28.1	28.2	28.2	7.5	7.6	7.6	110.5	110.7	110.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7			
					Bottom	26.6	26.5	26.6	28.3	28.4	28.4	7.4	7.4	7.4	107.9	107.7	107.8	1.9	1.9	1.9					1.9	1.9	1.9	
G6	1753-1810	17.5	W	0.3	Surface	27.1	27.0	27.1	27.9	28.0	28.0	8.7	8.7	8.7	128.1	127.9	128.0	1.9	2.0	2.0					2.1	2.1	2.1	
					Middle	26.8	26.7	26.8	28.1	28.2	28.2	8.6	8.5	8.5	125.3	125.1	125.2	2.1	2.2	2.1	2.2	2.3	2.2	2.3	2.3			
					Bottom	26.5	26.5	26.5	28.3	28.4	28.4	8.4	8.4	8.4	122.7	122.9	122.8	2.5	2.5	2.5					2.6	2.7	2.7	
G7	2002-2020	23.6	W	0.4	Surface	27.1	27.1	27.1	28.1	28.2	28.2	8.2	8.1	8.1	119.6	119.3	119.5	2.0	2.1	2.0					2.2	2.2	2.2	
					Middle	27.0	26.9	27.0	28.3	28.4	28.4	7.9	7.9	7.9	116.0	116.3	116.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4			
					Bottom	26.8	26.7	26.8	28.5	28.6	28.6	7.8	7.8	7.8	113.5	113.4	113.5	2.4	2.5	2.4					2.6	2.6	2.6	
I1	2057-2113	16.9	W	0.3	Surface	26.9	26.8	26.9	28.1	28.2	28.2	7.9	7.8	7.8	115.2	115.0	115.1	1.4	1.5	1.4					1.5	1.6	1.6	
					Middle	26.7	26.7	26.7	28.3	28.4	28.4	7.7	7.6	7.6	112.0	111.8	111.9	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8			
					Bottom	26.6	26.5	26.6	28.5	28.6	28.6	7.4	7.4	7.4	108.8	108.6	108.7	1.9	1.9	1.9					2.1	2.1	2.1	

Remark or Observation:

Note: * Average

** Depth Average

Date: 21-Jun-16
 Tide: Mid-Ebb
 Weather: Fine
 Sea Conditions: Small Wave
 Zone B to C

Location	Sampling Time	Water Depth (m)	Current direction	Current speed (ms ⁻¹)	Monitoring Depth	Temperature (°C)			Salinity (ppt)			DO (mg/l)			DO Saturation (%)			Turbidity (NTU)				Suspended Solids (mg/l)						
						1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	1	2	Ave.*	D.A.**	1	2	Ave.*	D.A.**			
B2	1415-1430	12.2	W	0.2	Surface	27.1	27.2	27.2	28.2	28.3	28.3	7.6	7.6	7.6	112.2	111.9	112.1	1.7	1.7	1.7	1.5	1.5	1.5	1.9	1.8	1.9		
					Middle	26.9	26.9	26.9	28.5	28.6	28.6	7.5	7.5	7.5	109.7	110.1	109.9	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6			
					Bottom	26.6	26.5	26.6	28.8	28.7	28.8	7.3	7.4	7.3	107.2	107.5	107.4	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4			
B3	1331-1347	12.4	W	0.2	Surface	27.2	27.3	27.3	28.2	28.3	28.3	7.8	7.8	7.8	114.5	114.8	114.7	1.7	1.6	1.7	1.5	1.5	1.4	1.5	1.5	1.9	1.8	1.9
					Middle	27.0	26.9	27.0	28.6	28.5	28.6	7.4	7.4	7.4	108.7	108.9	108.8	1.4	1.5	1.4	1.5	1.5	1.6	1.6	1.6			
					Bottom	26.6	26.5	26.6	28.7	28.8	28.8	7.3	7.3	7.3	107.2	106.8	107.0	1.3	1.3	1.3	1.3	1.3	1.3	1.5	1.4	1.5		
C3	1131-1147	29.2	W	0.2	Surface	27.0	26.9	27.0	28.1	28.2	28.2	8.4	8.4	8.4	123.5	123.1	123.3	2.8	2.7	2.8	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7
					Middle	26.7	26.8	26.8	28.4	28.3	28.4	8.2	8.1	8.2	119.5	119.3	119.4	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7			
					Bottom	26.4	26.3	26.4	28.5	28.6	28.6	7.8	7.8	7.8	113.1	113.4	113.3	2.2	2.1	2.2	2.2	2.2	2.4	2.3	2.4			
E1	1237-1253	22.8	W	0.3	Surface	27.2	27.1	27.2	28.0	27.9	28.0	7.4	7.5	7.4	109.3	109.7	109.5	1.8	1.8	1.8	1.6	1.6	1.8	1.8	1.7	1.8	1.7	
					Middle	26.9	27.0	27.0	28.2	28.3	28.3	7.3	7.3	7.3	107.3	107.4	107.4	1.6	1.5	1.6	1.6	1.8	1.7	1.8	1.7			
					Bottom	26.8	26.7	26.8	28.5	28.5	28.5	7.8	7.8	7.8	114.2	114.7	114.5	1.4	1.4	1.4	1.4	1.5	1.5	1.5				
E4	1153-1209	22.2	W	0.2	Surface	27.1	27.1	27.1	28.0	28.1	28.1	7.3	7.2	7.3	106.9	106.5	106.7	2.0	2.1	2.0	2.1	2.1	2.2	2.1	2.2	2.2	2.2	
					Middle	26.9	26.8	26.9	28.3	28.4	28.4	7.1	7.1	7.1	104.6	104.2	104.4	2.3	2.2	2.2	2.1	2.1	2.5	2.4	2.5	2.3		
					Bottom	26.6	26.5	26.6	28.6	28.7	28.7	7.2	7.2	7.2	104.7	104.9	104.8	2.0	1.9	1.9	2.1	2.1	2.2	2.1	2.1			
E5	1109-1125	18.0	W	0.3	Surface	26.9	27.0	27.0	27.9	28.0	28.0	8.6	8.7	8.6	126.1	126.9	126.5	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.4	
					Middle	26.8	26.7	26.8	28.2	28.3	28.3	8.5	8.5	8.5	124.3	124.1	124.2	2.4	2.5	2.5	2.3	2.7	2.7	2.7	2.7			
					Bottom	26.5	26.4	26.5	28.6	28.5	28.6	8.4	8.4	8.4	121.9	122.1	122.0	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.3			
G4	1434-1447	24.4	W	0.4	Surface	27.3	27.2	27.3	28.3	28.4	28.4	7.4	7.4	7.4	108.9	108.7	108.8	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.8	2.8	2.8	
					Middle	27.0	27.1	27.1	28.4	28.5	28.5	7.3	7.2	7.2	106.6	106.2	106.4	2.3	2.3	2.3	2.6	2.6	2.4	2.5	2.8			
					Bottom	26.8	26.7	26.8	28.7	28.8	28.8	6.9	6.9	6.9	101.5	101.3	101.4	2.8	2.9	2.8	2.9	2.9	3.0	3.0				
G5	1215-1231	21.2	W	0.2	Surface	27.1	27.2	27.2	28.1	28.0	28.1	7.4	7.3	7.4	108.2	108.0	108.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.4	
					Middle	26.9	26.9	26.9	28.3	28.4	28.4	7.2	7.2	7.2	105.7	105.3	105.5	2.1	2.0	2.0	2.1	2.3	2.2	2.3	2.3			
					Bottom	26.7	26.6	26.7	28.6	28.5	28.6	7.1	7.1	7.1	103.4	103.5	103.5	2.0	1.9	2.0	2.0	2.2	2.1	2.2				
G6	1047-1103	17.2	W	0.2	Surface	26.9	26.8	26.9	27.8	27.9	27.9	8.7	8.7	8.7	127.2	127.0	127.1	2.5	2.4	2.4	2.2	2.2	2.4	2.4	2.7	2.6	2.7	
					Middle	26.6	26.5	26.6	28.1	28.2	28.2	8.6	8.6	8.6	125.3	125.1	125.2	2.2	2.3	2.2	2.2	2.4	2.4	2.4	2.4			
					Bottom	26.4	26.4	26.4	28.5	28.6	28.6	8.5	8.4	8.5	123.5	123.1	123.3	2.1	2.0	2.0	2.1	2.2	2.2	2.2				
G7	1259-1315	23.2	W	0.2	Surface	27.2	27.2	27.2	28.0	28.1	28.1	7.7	7.8	7.8	114.0	114.2	114.1	1.8	1.7	1.7	1.5	1.5	1.5	1.5	1.9	1.8	1.9	
					Middle	26.8	26.7	26.8	28.4	28.5	28.5	7.7	7.7	7.7	112.8	112.6	112.7	1.5	1.5	1.5	1.5	1.5	1.7	1.6	1.6			
					Bottom	26.7	26.6	26.7	28.5	28.6	28.6	7.6	7.5	7.6	110.8	110.5	110.7	1.3	1.4	1.3	1.3	1.4	1.5	1.5				
I1	1253-1409	16.6	W	0.3	Surface	27.2	27.2	27.2	28.3	28.2	28.3	7.7	7.7	7.7	112.8	113.1	113.0	1.9	1.9	1.9	1.6	1.6	1.6	1.6	2.1	2.1	2.1	
					Middle	27.1	27.0	27.1	28.3	28.4	28.4	7.6	7.6	7.6	111.6	111.4	111.5	1.6	1.5	1.6	1.6	1.8	1.7	1.8	1.8			
					Bottom	26.7	26.6	26.7	28.6	28.7	28.7	7.4	7.3	7.3	107.8	107.6	107.7	1.4	1.5	1.4	1.4	1.5	1.6	1.6				

Remark or Observation:

Note: * Average
 ** Depth Average

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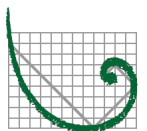
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