# H2H Express Submarine Cable

HUAWEI MARINE

## Post Project Water Quality Monitoring Report (Zone B)

16 July 2021

Project No.: 0586211

*The business of sustainability*

ERM

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## Signature Page

16 July 2021

# H2H Express Submarine Cable

## Post Project Water Quality Monitoring Report (Zone B)

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中国移动 China Mobile
INTERNATIONAL

# Environmental Permit No. EP-575/2020
# H2H Express (H2HE) Submarine Cable

## Environmental Team Leader Certification & Independent Environmental Checker Verification

**Reference Document/Plan**

| | |
|---|---|
| Document/~~Plan~~: | Post Project Water Quality Monitoring Report (Zone B) |
| Date of Report: | 16 July 2021 |
| Certified by ET: | ERM-Hong Kong Ltd. |
| Verified by IEC: | Ecosystems Ltd. |

**Reference EP Requirement**

| EP Condition: | Conditions No. 3.2 – 3.3 |
|---|---|

*Content:* *Water Quality Monitoring*

3.2 Samples, measurements and necessary remedial actions shall be taken in accordance with the EM&A requirements described in the Project Profile (Register No.: PP-599/2020) by:

(a) conducting baseline environmental monitoring;

(b) conducting impact monitoring;

(c) conducting post project monitoring; and

(d) carrying out remedial actions described in the Event/Action Plans, or as agreed by the Director, in case where specified criteria are exceeded.

3.3 The Permit Holder shall submit to the Director three hard copies and one electronic copy of the following reports as defined in the EM&A requirements described in the Project Profile (Register No.: PP-599/2020):

(a) Baseline Monitoring Report on water quality at least 2 weeks before the commencement of cable installation works;

(b) Weekly EM&A Report within five days after the relevant monitoring data are collected and audited by IEC; and

(c) Post Project Monitoring Report within one month after completion of the marine works.

**ET Certification**

I hereby certify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-575/2020.

Mandy To

Mandy To, Environmental Team Leader

Date: 13 July 2021

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**IEC Verification**

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-575/2020.

Dr Vincent Lai, Independent Environmental Checker:

Date: 14 July 2021

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# EXECUTIVE SUMMARY

The cable installation works for the **H2H Express (H2HE) Submarine Cable** (the 'Project') have been carried out in phases:

- **Phase 1** Land & Shore-End Cable Installation and Submarine Cable Installation up to end of Zone A – completed on 17 April 2021; and
- **Phase 2** Remaining Submarine Cable Installation (from end of Zone A to the eastern boundary of HKSAR waters; including Zone B) – completed on 18 June 2021.

Phase 2 of the Project commenced with the remaining installation marine diver jetting works from end of Zone A to the eastern boundary of HKSAR waters (including Zone B), on 23 May 2021, and were completed on 18 June 2021.

This is the *Post Project Water Quality Monitoring Report (Zone B),* presenting the results of the EM&A post installation water quality monitoring in Zone B which has been conducted from 21 to 25 June 2021, in accordance with *Appendix G* of the *Project Profile* and the requirements under EP-575/2020.

## *Water Quality in Zone B*

Post Project Water Quality Monitoring was carried out on three (3) occasions (i.e. days) at all monitoring stations within Zone B and took place one (1) week after the completion of the *Phase 2 Remaining Submarine Cable Installation,* and the intervals between two (2) sets of monitoring were not less than 36 hours. The water quality sampling was undertaken within 2 hours before and 2 hours after mid-flood and mid-ebb tidal state on each sampling occasion.

Post project data showed smaller dissolved oxygen (DO) ranges (and on average lower values), similar turbidity and similar SS records compared to the baseline data. The overall water quality at the impact monitoring stations and gradient stations in Zone B was found to be similar to that at the control stations (about 240 m [flood tide] and 980 m [ebb tide] from the proposed cable alignment). As such, water quality at the control station could not have been affected by the Project, and it is concluded that the overall changes in DO, turbidity and SS levels during the post project monitoring period at all designated stations in Zone B, including the control station, are likely to represent natural variation and were not due to the Project.

## *Conclusion*

No deterioration of water quality was observed between post project and baseline monitoring for marine works for *Phase 2 Remaining Submarine Cable Installation* of this Project, and therefore it is considered that the Project works had negligible impact on water quality.

# 1. INTRODUCTION

## 1.1 Background

ERM-Hong Kong, Limited (ERM) was appointed by Huawei Marine Networks Co., Ltd (HMN) as the Environmental Team (ET) to implement the Environmental Monitoring and Audit (EM&A) programme for the H2H Express Submarine Cable (hereafter known as 'H2HE' and / or the 'Project').

The proposed submarine cable is a section of the H2HE optical fibre cable system, which is over 680 kilometers long in total. The system will further boost the external telecommunications capacity of Hong Kong, reinforcing Hong Kong as a key communication hub in Asia.

The cable will connect to Chung Hom Kok (CHK) within the HKSAR. **China Mobile International (CMI)** is providing the cable landing point and the associated cable landing services in Hong Kong.

The route of the proposed H2HE submarine cable system within Hong Kong SAR is depicted in ***Figure 1.1***. The proposed cable would land at an existing Beach Manhole (BMH) location at Sha Shek Tan (SST), CHK, and connect to an existing Cable Landing Station (CLS).

It should be noted that CHK is currently the landing site for a number of submarine cables (i.e. New T&T domestic cable route, C2C Cable network; and SJC). The existing BMH is connected to the CLS on the hill above the landing beach and existing conduits connect the BMH and CLS.

The cable will travel from SST of CHK southward, exiting Stanley Bay, running south-east, passing the Stanley Peninsular, turning east near the south of Po Toi Island, to the eastern boundary of HKSAR waters, where it will enter the South China Sea.

The Project Profile (PP-599/2020) 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 CHK) 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 17 April 2020, EPD issued a letter to CMI permitting direct application for an environmental permit and following an application, EPD subsequently issued an Environmental Permit (EP-575/2020) on 21 May 2020.

Pursuant to *Condition 3.1* of the EP, an Environmental Monitoring and Audit (EM&A) programme, as set out in the Project Profile (PP) is required for this Project. As per *Condition 3.2* of the EP regarding Water Quality Monitoring, there is a requirement to conduct water quality baseline monitoring and impact monitoring. The corresponding Action and Limit Levels are derived from the baseline data.

The H2HE cable installation has been carried out in two (2) phases, with Phase 1 covering land & shore-end works and up to end of Zone A, and Phase 2 covering the remaining marine works of the submarine cable installation. The phasing of the cable installation works is shown in ***Figure 1.2*** to ***Figure 1.4***, and the current schedule and works carried out to date for each Phase is as follows:

1) **Phase 1 Land & Shore-End Cable Installation and Submarine Cable Installation up to end of Zone A:** Shore-end cable installation to the BMH at SST, CHK, involving land trench excavation and shore-end cable installation of the H2HE submarine cable (i.e. from seaward edge of the beach to approximately 300 m out from the BMH) using diver jetting. Installation of the H2HE submarine cable from shore-end to the end of Zone A (i.e. HK Grid coordinate 838858.620E 806852.911N / at 1.933 km from the landing point), using injector burial tools / sledge tools for simultaneous lay and burial operations.

    a. Baseline data for Zone A was collected prior to the start of Phase 1 cable installation works (i.e. between 17 February and 15 March 2021) and Action and Limit Levels derived from these data, as presented in the final *Baseline Water Quality Monitoring Report (Zone A)*.

b. Land trenching commenced 8 April 2021. Following issue of Marine Department Notice on 25 February 2021.

c. Nearshore marine diver jetting works commenced on 8 April 2021, and was completed on 17 April 2021, as presented in the two (2) weekly impact water quality monitoring reports for Zone A.

2) **Phase 2 Remaining Submarine Cable Installation (Zone B):** Installation of the H2HE submarine cable from the end of Zone A (i.e. HK Grid coordinate 838858.620E 806852.911N / at 1.933 km from the landing point), to HKSAR marine eastern boundary, using injector burial tools/ sledge tools for simultaneous lay and burial operations, and potential diver jetting in specific areas (e.g. HK Electric Pipeline crossing).

a. Remaining marine installation works from end of Zone A to the HKSAR marine eastern boundary using jetting technique were commenced on 23 May 2021, and were completed on 18 June 2021.

Given the commencement dates for Phase 1 and Phase 2 cable installation and jetting works are scheduled to start around two (2) months apart, the baseline data (and corresponding Action and Limit Levels) were subsequently presented in separate reports for each Phase.

This report covers the Project's *Phase 2 Remaining Submarine Cable Installation (Zone B)* (as show in ***Figure 1.4***).

## 1.2 Purpose of this Report

This is the Post Project Water Quality Monitoring Report in Zone B for Phase 2 of the Project (Remaining Submarine Cable Installation), and summarises the results of the post installation water quality monitoring conducted in Zone B from 21 to 25 June 2021. The post installation water quality monitoring results are used to compare with the Baseline and Impact monitoring results from Zone B in order to investigate any potential impact of the Project works on the water quality in the vicinity of the Project.

Under the requirement of *Condition 3.3(c)* of the EP, the post project monitoring report on water quality shall be prepared and submitted to the EPD within one (1) month after completion of the marine works.

## 1.3 Status of Environmental Approval Documents

A summary of the relevant permits, licences, notifications and/or reports on environmental protection for this Project is presented in ***Table 1.1***:

**Table 1.1 Summary of Environmental Licensing, Notification, Permit and Reporting Status**

| Permit / Licence / Notification / Report | Reference | Validity Period | Remarks |
|---|---|---|---|
| Environmental Permit | (EP-575/2020) Available at https://www.epd.gov.hk/eia/register/permit/latest/ep5752020.htm | Throughout construction & operation period | Granted on 21 May 2020 |

| Permit / Licence / Notification / Report | Reference | Validity Period | Remarks |
|---|---|---|---|
| EM&A Manual | (PP-599/2020)<br>As part of the Project Profile; available at:<br>https://www.epd.gov.hk/eia/english/alpha/aspd_764.html | Throughout construction & operation period | Approved by EPD on 17 April 2020 |
| Marine Department Notice | (No. 45/2021)<br>Available at:<br>https://www.mardep.gov.hk/en/notices/pdf/mdn21045.pdf | Throughout construction & operation period | Issued by the Marine Department on 25 February 2021 |
| *Baseline Water Quality Monitoring Report (Zone A)*<br>and<br>*Pre-Installation Coral Survey Report* | Available at:<br>https://www.epd.gov.hk/eia/english/register/aep/ep5752020_content.html | Throughout construction period for Phase 1 works in Zone A | Approved by EPD as of 23 April 2021 |
| *Baseline Water Quality Monitoring Report (Zone B)* | Available at:<br>https://www.epd.gov.hk/eia/register/english/permit/ep5752020/documents/blwqmr2/pdf/blwqmr2.pdf | Throughout construction period for Phase 2 works in Zone B | Approved by EPD as of 26 May 2021 |
| *1st Weekly Impact Water Quality Monitoring Report (Zone A)* | Available at:<br>https://www.epd.gov.hk/eia/register/english/permit/ep5752020/documents/1wiwqmr/pdf/1wiwqmr.pdf | Throughout construction period for Phase 1 works in Zone A | Approved by EPD as of 26 May 2021 |
| *Post Project Water Quality Monitoring Report (Zone A)* | Available at:<br>https://www.epd.gov.hk/eia/register/english/permit/ep5752020/documents/ppwqmr/pdf/ppwqmr.pdf | Throughout construction period for Phase 1 works in Zone A | Approved by EPD as of 26 May 2021 |
| *2nd Weekly Impact Water Quality Monitoring Report (Zone A)* | Currently unavailable online, at the time of this report | Throughout construction period for Phase 1 works in Zone A | Approval by EPD still ongoing at the time of report writing |
| *3rd Weekly Impact Water Quality Monitoring Report (Zone B)* | Available at:<br>https://www.epd.gov.hk/eia/register/english/permit/ep5752020/documents/3wiwqmr/pdf/3wiwqmr.pdf | Throughout construction period for Phase 2 works in Zone B | Approved by EPD as of 18 June 2021 |

## 1.4 Structure of this Report

The remainder of the report is structured as follows:

***Section 1: Introduction***

Provide details of the background, purpose and structure of the report, the status of Environmental Permits/Licenses during the reporting period, and structure of the report.

***Section 2: Water Quality Monitoring Requirements***

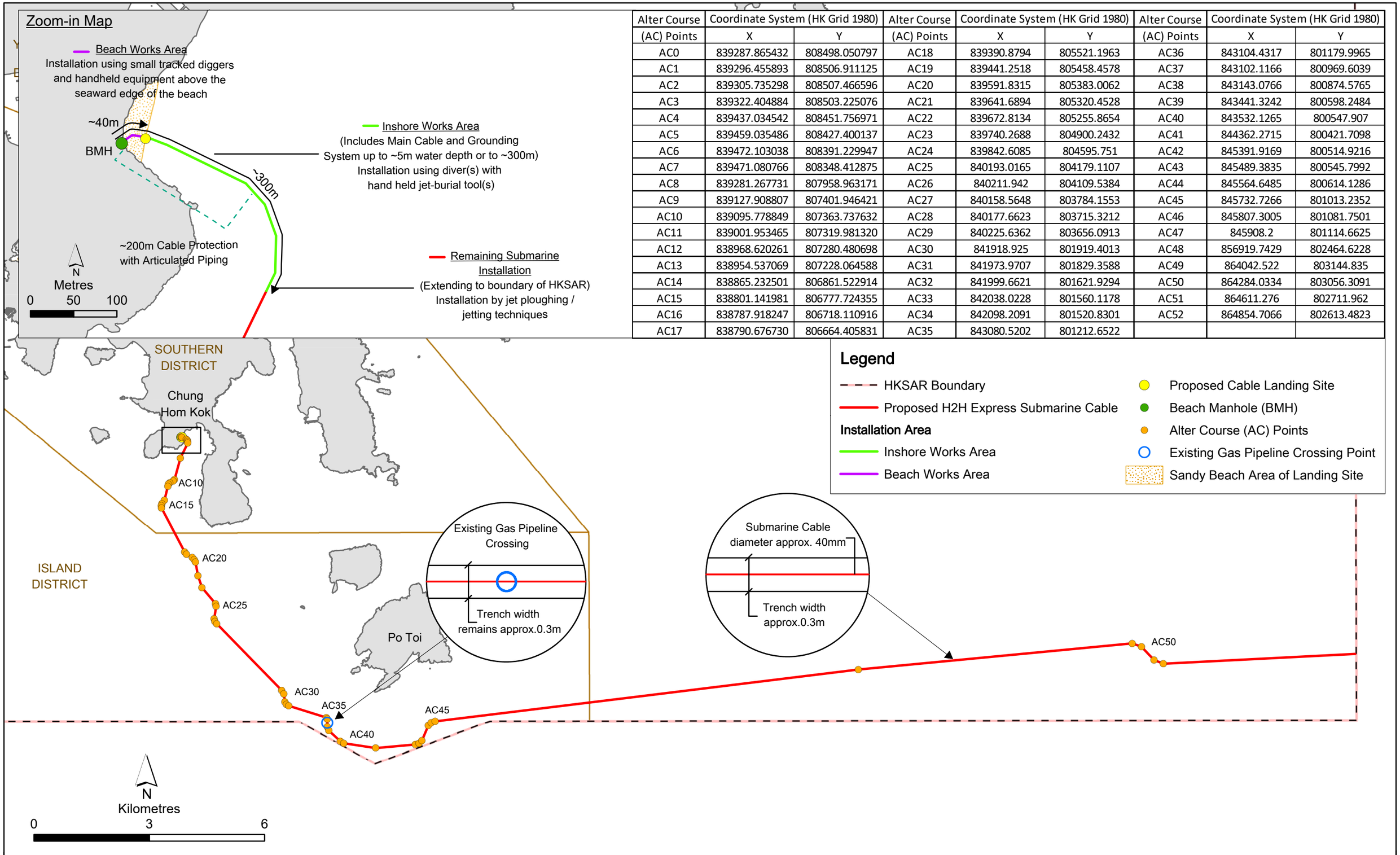
Summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, and monitoring locations.

***Section 3: Monitoring Results***

Summarises the monitoring results obtained in the reporting period.

***Section 4: Conclusions***

Presents the key findings of the post installation monitoring results in Zone B.




| Alter Course (AC) Points | Coordinate System (HK Grid 1980) X | Y | Alter Course (AC) Points | Coordinate System (HK Grid 1980) X | Y | Alter Course (AC) Points | Coordinate System (HK Grid 1980) X | Y |
|---|---|---|---|---|---|---|---|---|
| AC0 | 839287.865432 | 808498.050797 | AC18 | 839390.8794 | 805521.1963 | AC36 | 843104.4317 | 801179.9965 |
| AC1 | 839296.455893 | 808506.911125 | AC19 | 839441.2518 | 805458.4578 | AC37 | 843102.1166 | 800969.6039 |
| AC2 | 839305.735298 | 808507.466596 | AC20 | 839591.8315 | 805383.0062 | AC38 | 843143.0766 | 800874.5765 |
| AC3 | 839322.404884 | 808503.225076 | AC21 | 839641.6894 | 805320.4528 | AC39 | 843441.3242 | 800598.2484 |
| AC4 | 839437.034542 | 808451.756971 | AC22 | 839672.8134 | 805255.8654 | AC40 | 843532.1265 | 800547.907 |
| AC5 | 839459.035486 | 808427.400137 | AC23 | 839740.2688 | 804900.2432 | AC41 | 844362.2715 | 800421.7098 |
| AC6 | 839472.103038 | 808391.229947 | AC24 | 839842.6085 | 804595.751 | AC42 | 845391.9169 | 800514.9216 |
| AC7 | 839471.080766 | 808348.412875 | AC25 | 840193.0165 | 804179.1107 | AC43 | 845489.3835 | 800545.7992 |
| AC8 | 839281.267731 | 807958.963171 | AC26 | 840211.942 | 804109.5384 | AC44 | 845564.6485 | 800614.1286 |
| AC9 | 839127.908807 | 807401.946421 | AC27 | 840158.5648 | 803784.1553 | AC45 | 845732.7266 | 801013.2352 |
| AC10 | 839095.778849 | 807363.737632 | AC28 | 840177.6623 | 803715.3212 | AC46 | 845807.3005 | 801081.7501 |
| AC11 | 839001.953465 | 807319.981320 | AC29 | 840225.6362 | 803656.0913 | AC47 | 845908.2 | 801114.6625 |
| AC12 | 838968.620261 | 807280.480698 | AC30 | 841918.925 | 801919.4013 | AC48 | 856919.7429 | 802464.6228 |
| AC13 | 838954.537069 | 807228.064588 | AC31 | 841973.9707 | 801829.3588 | AC49 | 864042.522 | 803144.835 |
| AC14 | 838865.232501 | 806861.522914 | AC32 | 841999.6621 | 801621.9294 | AC50 | 864284.0334 | 803056.3091 |
| AC15 | 838801.141981 | 806777.724355 | AC33 | 842038.0228 | 801560.1178 | AC51 | 864611.276 | 802711.962 |
| AC16 | 838787.918247 | 806718.110916 | AC34 | 842098.2091 | 801520.8301 | AC52 | 864854.7066 | 802613.4823 |
| AC17 | 838790.676730 | 806664.405831 | AC35 | 843080.5202 | 801212.6522 | | | |

Figure 1.1

Proposed H2H Express Submarine Cable

File: T:\GIS\CONTRACT\0586211\mxd\0586211_Cable_Overview_with_crossing_and_zoom.mxd
Date: 18/3/2021

Environmental Resources Management

ERM

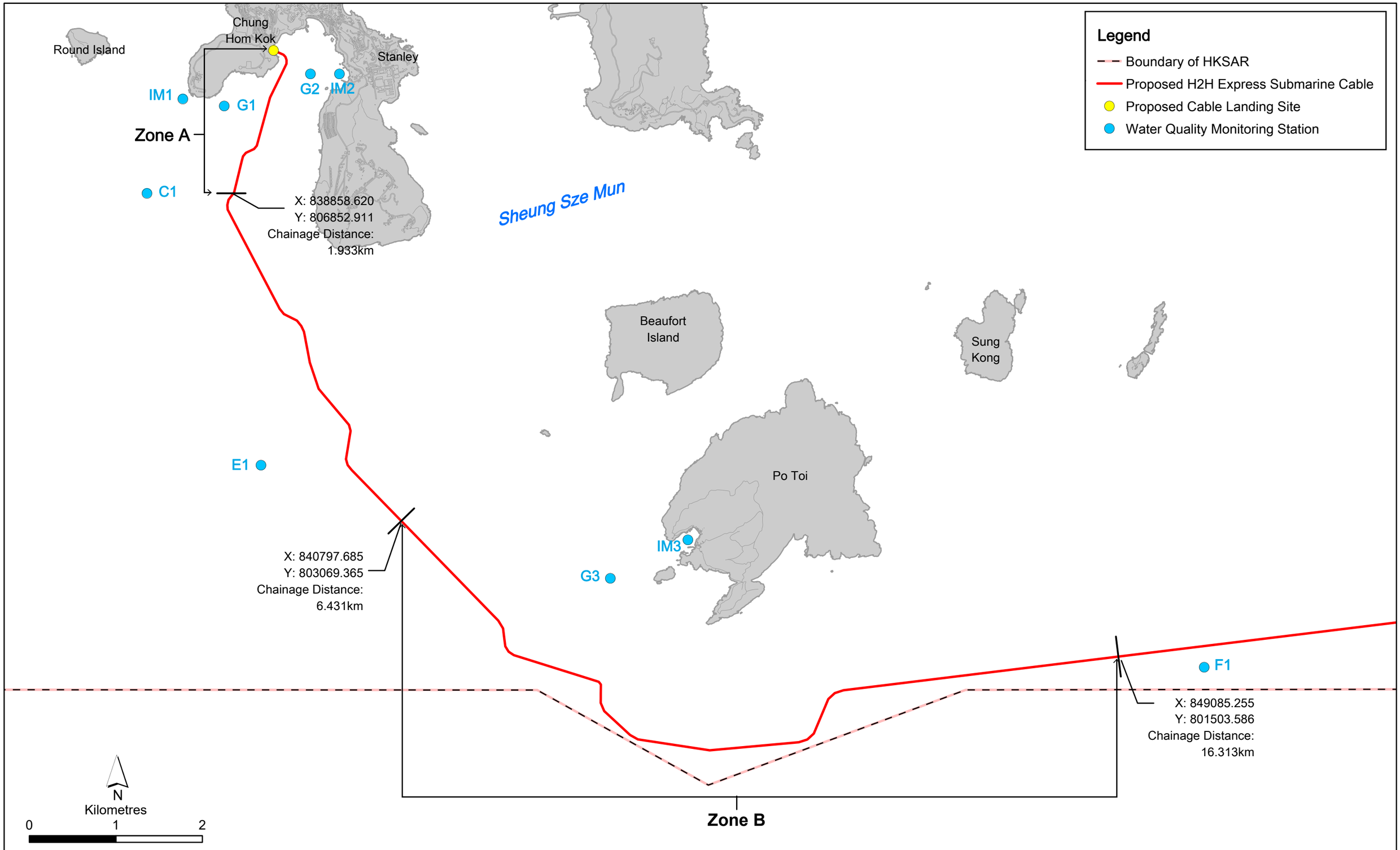



Figure 1.2

Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0586211\mxd\0586211_Water_Quality_Monitoring_Station.mxd
Date: 8/4/2021

Environmental Resources Management

ERM

Legend

Proposed H2H Express Submarine Cable

Proposed Cable Landing Site

Water Quality Monitoring Station

Chung Hom Kok

Stanley

IM1

G1

G2

IM2

C1

N

Meters

0 250 500

Figure 1.3

Water Quality Monitoring Stations - Zone A

File: T:\GIS\CONTRACT\0586211\mxd\0586211_WQMS_ZoneA.mxd
Date: 8/4/2021

Environmental Resources Management

ERM

Legend

Boundary of HKSAR

Proposed H2H Express Submarine Cable

Water Quality Monitoring Station

Beaufort Island

Sung Kong

Po Toi

E1

IM3

G3

F1

N

Meters

0 1,000 2,000

Figure 1.4

Water Quality Monitoring Stations - Zone B

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Date: 8/4/2021

Environmental Resources Management

ERM

# 2. WATER QUALITY MONITORING

## 2.1 Monitoring Location

In accordance with the *Appendix G* of approved PP, water quality sampling was undertaken at stations situated around the cable laying works in Zone B. The locations of the sampling stations within Zone B are listed in ***Table 2.1*** and shown in ***Figure 1.2*** and ***Figure 1.4.***

**Table 2.1 Water Quality Monitoring Stations**

| Station [2] | Nature | Approx. Geodesic Distance [1] to Proposed Cable Alignment (m) | Easting | Northing |
|---|---|---|---|---|
| Zone **B**: The waters to the west and south of the Po Toi Island. Covers the cable alignment between Chainage 6.431 km and 16.312 km. | | | | |
| IM3 | Po Toi Fish Culture Zone | 2020 | 844111 | 802850 |
| G3 | Gradient Stations (Between Po Toi Fish Culture Zone cable alignment) | 1170 | 843215 | 802408 |
| E1 | Control Station for Zone B in Ebb Tide | 980 | 839178 | 803714 |
| F1 | Control Station for Zone B in Flood Tide | 240 | 850078 | 801380 |

**Note:**
(1) Geodesic distance refers to the shortest straight line distance between two locations, without regard on the physical obstacles in between.
(2) These station will also serve as monitoring stations for Spawning Ground of Commercial Fisheries Resources.

## 2.2 Sampling and Testing Methodology

The post installation water quality monitoring in Zone B was conducted in accordance with the requirements stated in the *Appendix G* of approved PP. These are presented below.

### *2.2.1 Parameters Measured*

The parameters measured *in situ* were:

- dissolved oxygen (DO) (% saturation and $mgL^{-1}$)
- temperature (°C)
- turbidity (NTU)
- salinity (‰ or ppt)

The only parameter to be measured in the laboratory was:

- suspended solids (SS) ($mgL^{-1}$)

In addition to the water quality parameters, other relevant data had also been measured and recorded in field logs, including the location of the sampling stations and cable vessel/ burial machine at the time of sampling, water depth, time, weather conditions, sea conditions, tidal state, current direction and speed, special phenomena and work activities undertaken around the monitoring and works area that may influence the monitoring results.

### *2.2.2 Equipment*

***Table 2.2*** summaries the equipment used for the impact water quality monitoring.

**Table 2.2 Equipment used during Impact Water Quality Monitoring (Zone B)**

| Equipment | Model |
|---|---|
| Global Positioning Device | Garmin etrex 20x |

| Equipment | Model |
|---|---|
| Water Depth Gauge | Sontek Riversurveyor |
| Water Sampling Equipment | Aquatic Research Instruments horizontal / vertical types 2.2L |
| Salinity, DO, Temperature Measuring Meter | YSI ProDSS (Multi-Parameter) |
| Current Velocity and Direction | Sontek Riversurveyor |
| Turbidity Meter | YSI ProDSS (Multi-Parameter) |

### 2.2.3 Monitoring Frequency and Timing

Post Installation Monitoring at all monitoring stations within Zone B (i.e. IM3, G3, E1, and F1) took place one (1) week after the completion of the Phase 2 cable installation works within Zone B as shown in ***Figure 1.4***.

The interval between two (2) sets of post installation monitoring (i.e. including the collection of *In-situ* and SS data) during the cable installation works was no less than 36 hours and samples were taken twice during a 4 hour window of 2 hours before and 2 hours after a 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 [(1)]. Based on the predicted tidal levels at Waglan Island, the post installation water quality monitoring in Zone B was conducted between 21 to 25 June 2021, following the schedule presented in **Appendix A**.

### 2.2.4 Sampling / Testing Protocols

All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS (Quality Pro Test-Consult Limited) before use (see calibration reports in **Appendix 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* were observed. Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment were made available so that monitoring could proceed uninterrupted even when equipment is under maintenance, calibration etc.

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 least two (2) 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 (ALS Technichem (HK) Pty Ltd). Water samples of about 1,000 mL were collected at the monitoring, gradient and control stations for carrying out the laboratory determinations. The determination work shall start within the next working day after collection of the water samples. The SS laboratory measurements were provided within five (5) days of the sampling event. 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).

[(1)] Hong Kong Observatory (2021) http://www.hko.gov.hk/tide/predtide.htm?s=WAG [Accessed in June 2021]

The submitted information included pre-treatment procedures, instrument use, Quality Assurance/Quality Control (QA/QC) details (such as blank, spike recovery, number of duplicate samples per-batch etc.), detection limits and accuracy. The QA/QC details were in accordance with requirements of HOKLAS or another internationally accredited scheme (**Appendix C**).

### *2.2.6 Sampling Depths*

At each station, measurements and water samples were taken at three (3) depths, namely 1 m below water surface, mid-depth and 1 m above seabed. For stations that are less than 3 m in depth, only the mid-depth sample was taken. For stations that are less than 6 m in depth, only the surface and seabed sample was taken.

# 3. POST PROJECT MONITORING RESULTS IN ZONE B

A total of three (3) monitoring events were carried out between 21 to 25 June 2021 at Zone B for post installation water quality monitoring. All monitoring events at all designated monitoring stations within Zone B were performed on schedule, i.e. on 21, 23, and 25 June 2021, as detailed in ***Section 2.2.3***, following completion of the Project Phase 2 installation works on 18 June 2021. The post installation monitoring data within Zone B, with graphical presentations to compare the data against baseline and impact monitoring data for Zone B are presented in **Appendix D**.

The levels of DO measured during the post project monitoring period was generally close to the saturation level (>80%, except one occasion) but the absolute level of DO is generally lower than that of the baseline monitoring period. The lower DO levels in post-project monitoring is expected to be a result of increasing water temperature (recorded during baseline: 20.5-25.5°C, during post-project: 25.7-30.6°C) that reduce the maximum DO at saturation, as DO saturation recorded during baseline, and post-project monitoring stages are all very close to 100% saturation. Measured DO levels at the impact station (i.e. IM3) were found to be consistently above those observed at the control stations and gradient stations, indicating water quality variations during post-project monitoring was due to widespread natural variation and not isolated incidents due to the previous Project works.

Levels of turbidity and SS measured during the post project monitoring period were both very low throughout post-project monitoring period. Observed turbidity levels were below 3.5 NTU and that for SS was below 5.0 mg/L. Such observed ranges were similar to that of the baseline monitoring period (turbidity up to 4.1 NTU, SS up to 5.7 mg/L). The observed turbidity and SS levels at all monitoring stations were similar, generally within 2 NTU for turbidity and 2 mg/L for SS.

Given the above information, particularly with regards to the higher DO level at impact station in comparison to the control stations and gradient stations, as well as the low turbidity and SS levels consistently observed at all monitoring stations during post-project monitoring, it is concluded that there is no notable observed residual effect on water quality due to Project works.

# 4. CONCLUSION

This *Post Project Water Quality Monitoring Report (Zone B)* presents the results of the EM&A work undertaken from 21 to 25 June 2021 in accordance with the *Appendix G* of the approved Project Profile (PP) and the requirements under EP-575/2020.

Post Project Water Quality Monitoring was carried out on three (3) occasions (i.e. days) at all monitoring stations within Zone B and took place one (1) week after the completion of the Phase 2 cable installation works within Zone B on 18 June 2021. The intervals between two (2) sets of monitoring were not less than 36 hours. The water quality sampling was undertaken within 2 hours before and 2 hours after mid-flood and mid-ebb tidal state on each sampling occasion.

Post project data showed lower dissolved oxygen (DO) level than that of the baseline monitoring period. Investigation indicated that was a result of higher water temperature leading to lower saturation level of DO. The highest DO levels observed were consistently recorded at the impact station, which indicated the lower DO levels were not a result of project works but due to widespread natural variation. Low turbidity and SS levels were recorded at all monitoring stations and the levels were of similar range to that of the baseline level. As such, it is concluded that there is no notable observed residual effect on water quality due to Project works.

Although some changes in water quality were observed between post project and baseline monitoring for marine works under Phase 2 in Zone B of this Project, for the reasons explained above in ***Section 3***, none of these changes are considered to be as a result of the Phase 2 Project works. Phase 2 of this Project therefore had negligible impact on water quality.

# APPENDIX A POST PROJECT WATER QUALITY MONITORING SCHEDULE (ZONE B)

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| ebb tide 7:20 - 11:20<br>flood tide 13:43 - 17:43<br>***Zone B post project*** 21-Jun | 22-Jun | ebb tide 8:56 - 12:56<br>flood tide 15:57 - 19:57<br>***Zone B post project*** 23-Jun | 24-Jun | ebb tide 10:34 - 14:34<br>flood tide 17:48 - 21:48<br>***Zone B post project*** 25-Jun | 26-Jun | 27-Jun |

**Appendix A**
**H2HE Post Project Monitoring Schedule (Zone B)**

# APPENDIX B CERTIFICATES OF CALIBRATION FOR *IN SITU* MONITORING INSTRUMENTS

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. : BA060073
Date of Issue : 18 June 2021


## PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
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 | : | Jun 18, 2021 |
| Date of Calibration | : | Jun 18, 2021 |
| Date of Next Calibration[a] | : | Sep 17, 2021 |

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

| Parameter | Reference Method |
|---|---|
| pH at 25°C | APHA 21e 4500-$H^+$ B |
| Dissolved Oxygen | APHA 21e 4500-O G |
| 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[b,c]

### (1) pH at 25°C

| Target (pH unit) | Displayed Reading[d] (pH Unit) | Tolerance[e](pH Unit) | Results |
|---|---|---|---|
| 4.00 | 4.03 | 0.03 | Satisfactory |
| 7.42 | 7.45 | 0.03 | Satisfactory |
| 10.01 | 10.03 | 0.02 | Satisfactory |

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

### (2) Temperature

| Reading of Ref. thermometer (°C) | Displayed Reading (°C) | Tolerance (°C) | Results |
|---|---|---|---|
| 10 | 10.0 | 0.0 | Satisfactory |
| 25 | 24.9 | -0.1 | Satisfactory |
| 40 | 40.1 | 0.1 | Satisfactory |

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

~ CONTINUED ON NEXT PAGE ~

*Remark(s): -*

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

LEE Chun-ning, Desmond
Senior Chemist

專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED
Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong
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Tel: (852) 3956 8717; Fax: (852) 3956 3928

# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : BA060073
Date of Issue : 18 June 2021


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

### (3) Dissolved Oxygen

| Expected Reading (mg/L) | Displayed Reading (mg/L) | Tolerance (mg/L) | Results |
|---|---|---|---|
| 0.05 | 0.30 | 0.25 | Satisfactory |
| 3.40 | 3.52 | 0.12 | Satisfactory |
| 5.03 | 5.49 | 0.46 | Satisfactory |
| 7.34 | 7.43 | 0.09 | Satisfactory |

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

### (4) Conductivity at 25°C

| Conc. of KCl (M) | Expected Reading (µS/cm) | Displayed Reading (µS/cm) | Tolerance (%) | Results |
|---|---|---|---|---|
| 0.001 | 146.9 | 137.1 | -6.67 | Satisfactory |
| 0.01 | 1412 | 1327.6 | -5.98 | Satisfactory |
| 0.1 | 12890 | 12487.3 | -3.12 | Satisfactory |
| 0.5 | 58670 | 57240 | -2.44 | Satisfactory |
| 1.0 | 111900 | 109546 | -2.10 | Satisfactory |

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

### (5) Salinity

| Expected Reading (g/L) | Displayed Reading (g/L) | Tolerance (%) | Results |
|---|---|---|---|
| 10 | 10.02 | 0.20 | Satisfactory |
| 20 | 19.86 | -0.70 | Satisfactory |
| 30 | 29.84 | -0.53 | Satisfactory |

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

### (6) Turbidity

| Expected Reading (NTU) | Displayed Reading[f] (NTU) | Tolerance[g] (%) | Results |
|---|---|---|---|
| 0 | 0.09 | -- | Satisfactory |
| 10 | 9.86 | -1.4 | Satisfactory |
| 20 | 19.78 | -1.1 | Satisfactory |
| 100 | 97.55 | -2.5 | Satisfactory |
| 800 | 795.23 | -0.6 | Satisfactory |

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

~ END OF REPORT ~

*Remark(s): -*
*(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.*
*(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.*

# APPENDIX 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 | (mg/L) | % Recovery ** |
| 21-Jun-21 | E1-ME-S-1 | 4.3 | <0.5 | 102.0 |
| | F1-ME-B-2 | 8.8 | | |
| | G3-ME-B-1 | 5.0 | <0.5 | 108.0 |
| | F1-MF-M-1 | 8.6 | | |
| | G3-MF-M-1 | 2.3 | <0.5 | 103.0 |
| 23-Jun-21 | E1-ME-S-1 | 5.3 | <0.5 | 97.5 |
| | F1-ME-B-2 | 16.7 | | |
| | G3-ME-B-1 | 16.7 | <0.5 | 107.0 |
| | F1-MF-M-1 | 7.4 | | |
| | G3-MF-M-1 | 11.5 | <0.5 | 102.0 |
| 25-Jun-21 | E1-ME-S-1 | 8.3 | <0.5 | 105.0 |
| | F1-ME-B-2 | 11.5 | | |
| | G3-ME-B-1 | 0.0 | <0.5 | 102.0 |
| | F1-MF-M-1 | 9.1 | | |
| | G3-MF-M-1 | 11.1 | <0.5 | 106.0 |

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

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

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Client* | : | ENOVATIVE ENVIRONMENTAL SERVICE LTD | *Laboratory* | : | ALS Technichem (HK) Pty Ltd | *Page* | : 1 of 5 |
| *Contact* | : | MR THOMAS WONG | *Contact* | : | Richard Fung | *Work Order* | : **HK2124458** |
| *Address* | : | FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG | *Address* | : | 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| *E-mail* | : | thomas.wong@eno.com.hk | *E-mail* | : | richard.fung@alsglobal.com | | |
| *Telephone* | : | ---- | *Telephone* | : | +852 2610 1044 | | |
| *Facsimile* | : | ---- | *Facsimile* | : | +852 2610 2021 | | |
| *Project* | : | H2H EXPRESS SUBMARINE CABLE | | | | *Date received* | : 21-Jun-2021 |
| *Order number* | : | — | *Quote number* | : | HKE/1236/2021 | *Date of issue* | : 24-Jun-2021 |
| *C-O-C number* | : | — | | | | *No. of samples* | - *Received* : 44 |
| *Site* | : | — | | | | | - *Analysed* : 44 |



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

| *Signatory* | *Position* | *Authorised results for:* |
|---|---|---|
|  | | |
| **Fung Lim Chee, Richard** | **Managing Director** | **Inorganics** |

## *General Comments*

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 21-Jun-2021 to 24-Jun-2021.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

**Specific Comments for Work Order HK2124458 :**

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

## Analytical Results

| Sub-Matrix: MARINE WATER | | | Compound | EA025: Suspended Solids (SS) | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | LOR Unit | 0.5 mg/L | ---- | ---- | ---- | ---- |
| Sample ID | Sampling date / time | Laboratory sample ID | | EA/ED: Physical and Aggregate Properties | ---- | ---- | ---- | ---- |
| E1-ME-S-1 | 21-Jun-2021 | HK2124458-001 | | 4.6 | ---- | ---- | ---- | ---- |
| E1-ME-S-2 | 21-Jun-2021 | HK2124458-002 | | 5.4 | ---- | ---- | ---- | ---- |
| E1-ME-M-1 | 21-Jun-2021 | HK2124458-003 | | 4.9 | ---- | ---- | ---- | ---- |
| E1-ME-M-2 | 21-Jun-2021 | HK2124458-004 | | 5.2 | ---- | ---- | ---- | ---- |
| E1-ME-B-1 | 21-Jun-2021 | HK2124458-005 | | 4.7 | ---- | ---- | ---- | ---- |
| E1-ME-B-2 | 21-Jun-2021 | HK2124458-006 | | 4.8 | ---- | ---- | ---- | ---- |
| F1-ME-S-1 | 21-Jun-2021 | HK2124458-007 | | 4.6 | ---- | ---- | ---- | ---- |
| F1-ME-S-2 | 21-Jun-2021 | HK2124458-008 | | 4.2 | ---- | ---- | ---- | ---- |
| F1-ME-M-1 | 21-Jun-2021 | HK2124458-009 | | 3.9 | ---- | ---- | ---- | ---- |
| F1-ME-M-2 | 21-Jun-2021 | HK2124458-010 | | 3.5 | ---- | ---- | ---- | ---- |
| F1-ME-B-1 | 21-Jun-2021 | HK2124458-011 | | 3.4 | ---- | ---- | ---- | ---- |
| F1-ME-B-2 | 21-Jun-2021 | HK2124458-012 | | 3.8 | ---- | ---- | ---- | ---- |
| IM3-ME-S-1 | 21-Jun-2021 | HK2124458-013 | | 4.7 | ---- | ---- | ---- | ---- |
| IM3-ME-S-2 | 21-Jun-2021 | HK2124458-014 | | 5.2 | ---- | ---- | ---- | ---- |
| IM3-ME-B-1 | 21-Jun-2021 | HK2124458-017 | | 5.5 | ---- | ---- | ---- | ---- |
| IM3-ME-B-2 | 21-Jun-2021 | HK2124458-018 | | 6.0 | ---- | ---- | ---- | ---- |
| G3-ME-S-1 | 21-Jun-2021 | HK2124458-019 | | 5.0 | ---- | ---- | ---- | ---- |
| G3-ME-S-2 | 21-Jun-2021 | HK2124458-020 | | 5.2 | ---- | ---- | ---- | ---- |
| G3-ME-M-1 | 21-Jun-2021 | HK2124458-021 | | 5.1 | ---- | ---- | ---- | ---- |
| G3-ME-M-2 | 21-Jun-2021 | HK2124458-022 | | 5.3 | ---- | ---- | ---- | ---- |
| G3-ME-B-1 | 21-Jun-2021 | HK2124458-023 | | 4.0 | ---- | ---- | ---- | ---- |
| G3-ME-B-2 | 21-Jun-2021 | HK2124458-024 | | 4.6 | ---- | ---- | ---- | ---- |
| E1-MF-S-1 | 21-Jun-2021 | HK2124458-025 | | 4.1 | ---- | ---- | ---- | ---- |
| E1-MF-S-2 | 21-Jun-2021 | HK2124458-026 | | 5.0 | ---- | ---- | ---- | ---- |
| E1-MF-M-1 | 21-Jun-2021 | HK2124458-027 | | 4.8 | ---- | ---- | ---- | ---- |
| E1-MF-M-2 | 21-Jun-2021 | HK2124458-028 | | 5.0 | ---- | ---- | ---- | ---- |
| E1-MF-B-1 | 21-Jun-2021 | HK2124458-029 | | 5.6 | ---- | ---- | ---- | ---- |
| E1-MF-B-2 | 21-Jun-2021 | HK2124458-030 | | 4.8 | ---- | ---- | ---- | ---- |
| F1-MF-S-1 | 21-Jun-2021 | HK2124458-031 | | 4.0 | ---- | ---- | ---- | ---- |
| F1-MF-S-2 | 21-Jun-2021 | HK2124458-032 | | 3.6 | ---- | ---- | ---- | ---- |
| F1-MF-M-1 | 21-Jun-2021 | HK2124458-033 | | 3.5 | ---- | ---- | ---- | ---- |

Sub-Matrix: **MARINE WATER**

| | *Compound* | **EA025: Suspended Solids (SS)** | **----** | **----** | **----** | **----** |
|---|---|---|---|---|---|---|
| | *LOR Unit* | 0.5 mg/L | ---- | ---- | ---- | ---- |
| *Sample ID* | *Sampling date / time* | *Laboratory sample ID* | EA/ED: Physical and Aggregate Properties | ---- | ---- | ---- | ---- |
| **F1-MF-M-2** | 21-Jun-2021 | HK2124458-034 | **3.9** | **----** | **----** | **----** | **----** |
| **F1-MF-B-1** | 21-Jun-2021 | HK2124458-035 | **3.3** | **----** | **----** | **----** | **----** |
| **F1-MF-B-2** | 21-Jun-2021 | HK2124458-036 | **3.5** | **----** | **----** | **----** | **----** |
| **IM3-MF-S-1** | 21-Jun-2021 | HK2124458-037 | **7.0** | **----** | **----** | **----** | **----** |
| **IM3-MF-S-2** | 21-Jun-2021 | HK2124458-038 | **6.6** | **----** | **----** | **----** | **----** |
| **IM3-MF-B-1** | 21-Jun-2021 | HK2124458-041 | **6.5** | **----** | **----** | **----** | **----** |
| **IM3-MF-B-2** | 21-Jun-2021 | HK2124458-042 | **7.2** | **----** | **----** | **----** | **----** |
| **G3-MF-S-1** | 21-Jun-2021 | HK2124458-043 | **4.4** | **----** | **----** | **----** | **----** |
| **G3-MF-S-2** | 21-Jun-2021 | HK2124458-044 | **4.7** | **----** | **----** | **----** | **----** |
| **G3-MF-M-1** | 21-Jun-2021 | HK2124458-045 | **4.4** | **----** | **----** | **----** | **----** |
| **G3-MF-M-2** | 21-Jun-2021 | HK2124458-046 | **4.8** | **----** | **----** | **----** | **----** |
| **G3-MF-B-1** | 21-Jun-2021 | HK2124458-047 | **5.2** | **----** | **----** | **----** | **----** |
| **G3-MF-B-2** | 21-Jun-2021 | HK2124458-048 | **5.6** | **----** | **----** | **----** | **----** |

## Laboratory Duplicate (DUP) Report

Matrix: **WATER**

| Laboratory sample ID | Sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3750578)** | | | | | | | | |
| HK2124458-001 | E1-ME-S-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 4.6 | 4.8 | 5.8 |
| HK2124458-011 | F1-ME-B-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 3.4 | 3.7 | 10.6 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3750579)** | | | | | | | | |
| HK2124458-023 | G3-ME-B-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 4.0 | 3.8 | 2.6 |
| HK2124458-033 | F1-MF-M-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 3.5 | 3.2 | 8.2 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3750580)** | | | | | | | | |
| HK2124458-045 | G3-MF-M-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 4.4 | 4.3 | 2.8 |

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

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPDs (%) | |
| | | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3750578)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 102 | ---- | 85.9 | 117 | ---- | ---- |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3750579)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 108 | ---- | 85.9 | 117 | ---- | ---- |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3750580)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 103 | ---- | 85.9 | 117 | ---- | ---- |

## 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

| | | | | | |
|---|---|---|---|---|---|
| Client | : ENOVATIVE ENVIRONMENTAL SERVICE LTD | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 5 |
| Contact | : MR THOMAS WONG | Contact | : Richard Fung | Work Order | : HK2124459 |
| Address | : FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : thomas.wong@eno.com.hk | E-mail | : richard.fung@alsglobal.com | | |
| Telephone | : ---- | Telephone | : +852 2610 1044 | | |
| Facsimile | : ---- | Facsimile | : +852 2610 2021 | | |
| Project | : H2H EXPRESS SUBMARINE CABLE | | | Date received | : 23-Jun-2021 |
| Order number | : — | Quote number | : HKE/1236/2021 | Date of issue | : 28-Jun-2021 |
| C-O-C number | : — | | | No. of samples | - Received : 44 |
| Site | : — | | | | - Analysed : 44 |



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

| Signatory | Position | Authorised results for: |
|---|---|---|
| Fung Lim Chee, Richard | Managing Director | Inorganics |

## *General Comments*

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 23-Jun-2021 to 28-Jun-2021.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

**Specific Comments for Work Order HK2124459 :**

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

## Analytical Results

Sub-Matrix: **MARINE WATER**

| Sample ID | Sampling date / time | Laboratory sample ID | Compound | EA025: Suspended Solids (SS) | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | LOR Unit | 0.5 mg/L | ---- | ---- | ---- | ---- |
| | | | | EA/ED: Physical and Aggregate Properties | ---- | ---- | ---- | ---- |
| E1-ME-S-1 | 23-Jun-2021 | HK2124459-001 | | 1.9 | ---- | ---- | ---- | ---- |
| E1-ME-S-2 | 23-Jun-2021 | HK2124459-002 | | 1.3 | ---- | ---- | ---- | ---- |
| E1-ME-M-1 | 23-Jun-2021 | HK2124459-003 | | 1.2 | ---- | ---- | ---- | ---- |
| E1-ME-M-2 | 23-Jun-2021 | HK2124459-004 | | 2.0 | ---- | ---- | ---- | ---- |
| E1-ME-B-1 | 23-Jun-2021 | HK2124459-005 | | 1.7 | ---- | ---- | ---- | ---- |
| E1-ME-B-2 | 23-Jun-2021 | HK2124459-006 | | 2.8 | ---- | ---- | ---- | ---- |
| F1-ME-S-1 | 23-Jun-2021 | HK2124459-007 | | 2.0 | ---- | ---- | ---- | ---- |
| F1-ME-S-2 | 23-Jun-2021 | HK2124459-008 | | 2.7 | ---- | ---- | ---- | ---- |
| F1-ME-M-1 | 23-Jun-2021 | HK2124459-009 | | 2.3 | ---- | ---- | ---- | ---- |
| F1-ME-M-2 | 23-Jun-2021 | HK2124459-010 | | 2.5 | ---- | ---- | ---- | ---- |
| F1-ME-B-1 | 23-Jun-2021 | HK2124459-011 | | 1.8 | ---- | ---- | ---- | ---- |
| F1-ME-B-2 | 23-Jun-2021 | HK2124459-012 | | 2.4 | ---- | ---- | ---- | ---- |
| IM3-ME-S-1 | 23-Jun-2021 | HK2124459-013 | | 1.4 | ---- | ---- | ---- | ---- |
| IM3-ME-S-2 | 23-Jun-2021 | HK2124459-014 | | 2.0 | ---- | ---- | ---- | ---- |
| IM3-ME-B-1 | 23-Jun-2021 | HK2124459-017 | | 2.8 | ---- | ---- | ---- | ---- |
| IM3-ME-B-2 | 23-Jun-2021 | HK2124459-018 | | 2.3 | ---- | ---- | ---- | ---- |
| G3-ME-S-1 | 23-Jun-2021 | HK2124459-019 | | 2.7 | ---- | ---- | ---- | ---- |
| G3-ME-S-2 | 23-Jun-2021 | HK2124459-020 | | 2.5 | ---- | ---- | ---- | ---- |
| G3-ME-M-1 | 23-Jun-2021 | HK2124459-021 | | 2.0 | ---- | ---- | ---- | ---- |
| G3-ME-M-2 | 23-Jun-2021 | HK2124459-022 | | 2.6 | ---- | ---- | ---- | ---- |
| G3-ME-B-1 | 23-Jun-2021 | HK2124459-023 | | 1.8 | ---- | ---- | ---- | ---- |
| G3-ME-B-2 | 23-Jun-2021 | HK2124459-024 | | 2.2 | ---- | ---- | ---- | ---- |
| E1-MF-S-1 | 23-Jun-2021 | HK2124459-025 | | 1.1 | ---- | ---- | ---- | ---- |
| E1-MF-S-2 | 23-Jun-2021 | HK2124459-026 | | 1.9 | ---- | ---- | ---- | ---- |
| E1-MF-M-1 | 23-Jun-2021 | HK2124459-027 | | 2.1 | ---- | ---- | ---- | ---- |
| E1-MF-M-2 | 23-Jun-2021 | HK2124459-028 | | 3.0 | ---- | ---- | ---- | ---- |
| E1-MF-B-1 | 23-Jun-2021 | HK2124459-029 | | 3.4 | ---- | ---- | ---- | ---- |
| E1-MF-B-2 | 23-Jun-2021 | HK2124459-030 | | 2.8 | ---- | ---- | ---- | ---- |
| F1-MF-S-1 | 23-Jun-2021 | HK2124459-031 | | 1.4 | ---- | ---- | ---- | ---- |
| F1-MF-S-2 | 23-Jun-2021 | HK2124459-032 | | 2.3 | ---- | ---- | ---- | ---- |
| F1-MF-M-1 | 23-Jun-2021 | HK2124459-033 | | 2.7 | ---- | ---- | ---- | ---- |

Sub-Matrix: **MARINE WATER**

| | | | *Compound* | **EA025: Suspended Solids (SS)** | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | *LOR Unit* | 0.5 mg/L | ---- | ---- | ---- | ---- |
| *Sample ID* | *Sampling date / time* | *Laboratory sample ID* | | EA/ED: Physical and Aggregate Properties | ---- | ---- | ---- | ---- |
| **F1-MF-M-2** | 23-Jun-2021 | HK2124459-034 | | **2.1** | ---- | ---- | ---- | ---- |
| **F1-MF-B-1** | 23-Jun-2021 | HK2124459-035 | | **2.6** | ---- | ---- | ---- | ---- |
| **F1-MF-B-2** | 23-Jun-2021 | HK2124459-036 | | **3.4** | ---- | ---- | ---- | ---- |
| **IM3-MF-S-1** | 23-Jun-2021 | HK2124459-037 | | **1.7** | ---- | ---- | ---- | ---- |
| **IM3-MF-S-2** | 23-Jun-2021 | HK2124459-038 | | **2.3** | ---- | ---- | ---- | ---- |
| **IM3-MF-B-1** | 23-Jun-2021 | HK2124459-041 | | **4.0** | ---- | ---- | ---- | ---- |
| **IM3-MF-B-2** | 23-Jun-2021 | HK2124459-042 | | **3.5** | ---- | ---- | ---- | ---- |
| **G3-MF-S-1** | 23-Jun-2021 | HK2124459-043 | | **3.1** | ---- | ---- | ---- | ---- |
| **G3-MF-S-2** | 23-Jun-2021 | HK2124459-044 | | **4.2** | ---- | ---- | ---- | ---- |
| **G3-MF-M-1** | 23-Jun-2021 | HK2124459-045 | | **2.6** | ---- | ---- | ---- | ---- |
| **G3-MF-M-2** | 23-Jun-2021 | HK2124459-046 | | **3.0** | ---- | ---- | ---- | ---- |
| **G3-MF-B-1** | 23-Jun-2021 | HK2124459-047 | | **2.8** | ---- | ---- | ---- | ---- |
| **G3-MF-B-2** | 23-Jun-2021 | HK2124459-048 | | **2.3** | ---- | ---- | ---- | ---- |

## Laboratory Duplicate (DUP) Report

Matrix: **WATER**

| Laboratory sample ID | Sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3755990)** | | | | | | | | |
| HK2124459-001 | E1-ME-S-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 1.9 | 1.8 | 8.2 |
| HK2124459-011 | F1-ME-B-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 1.8 | 1.5 | 15.2 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3755991)** | | | | | | | | |
| HK2124459-023 | G3-ME-B-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 1.8 | 1.5 | 16.8 |
| HK2124459-033 | F1-MF-M-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 2.7 | 2.5 | 8.7 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3755992)** | | | | | | | | |
| HK2124459-045 | G3-MF-M-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 2.6 | 2.9 | 10.8 |

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

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPDs (%) | |
| | | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3755990)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 97.5 | ---- | 85.9 | 117 | ---- | ---- |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3755991)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 107 | ---- | 85.9 | 117 | ---- | ---- |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3755992)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 102 | ---- | 85.9 | 117 | ---- | ---- |

## 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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Client* | : | ENOVATIVE ENVIRONMENTAL SERVICE LTD | *Laboratory* | : | ALS Technichem (HK) Pty Ltd | *Page* | : 1 of 5 |
| *Contact* | : | MR THOMAS WONG | *Contact* | : | Richard Fung | *Work Order* | : **HK2124460** |
| *Address* | : | FLAT 2207, YU FUN HSE, YU CHUI COURT, SHATIN, N.T. HONG KONG | *Address* | : | 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| *E-mail* | : | thomas.wong@eno.com.hk | *E-mail* | : | richard.fung@alsglobal.com | | |
| *Telephone* | : | ---- | *Telephone* | : | +852 2610 1044 | | |
| *Facsimile* | : | ---- | *Facsimile* | : | +852 2610 2021 | | |
| *Project* | : | H2H EXPRESS SUBMARINE CABLE | | | | *Date received* | : 25-Jun-2021 |
| *Order number* | : | — | *Quote number* | : | HKE/1236/2021 | *Date of issue* | : 30-Jun-2021 |
| *C-O-C number* | : | — | | | | *No. of samples* | - *Received* : 44 |
| *Site* | : | — | | | | | - *Analysed* : 44 |



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

| *Signatory* | *Position* | *Authorised results for:* |
|---|---|---|
|  | | |
| **Fung Lim Chee, Richard** | **Managing Director** | **Inorganics** |

## *General Comments*

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 25-Jun-2021 to 30-Jun-2021.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

**Specific Comments for Work Order HK2124460 :**

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

## Analytical Results

| Sub-Matrix: MARINE WATER | | | Compound | EA025: Suspended Solids (SS) | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | LOR Unit | 0.5 mg/L | ---- | ---- | ---- | ---- |
| Sample ID | Sampling date / time | Laboratory sample ID | | EA/ED: Physical and Aggregate Properties | ---- | ---- | ---- | ---- |
| E1-ME-S-1 | 25-Jun-2021 | HK2124460-001 | | 2.4 | ---- | ---- | ---- | ---- |
| E1-ME-S-2 | 25-Jun-2021 | HK2124460-002 | | 2.0 | ---- | ---- | ---- | ---- |
| E1-ME-M-1 | 25-Jun-2021 | HK2124460-003 | | 1.9 | ---- | ---- | ---- | ---- |
| E1-ME-M-2 | 25-Jun-2021 | HK2124460-004 | | 1.7 | ---- | ---- | ---- | ---- |
| E1-ME-B-1 | 25-Jun-2021 | HK2124460-005 | | 1.5 | ---- | ---- | ---- | ---- |
| E1-ME-B-2 | 25-Jun-2021 | HK2124460-006 | | 1.2 | ---- | ---- | ---- | ---- |
| F1-ME-S-1 | 25-Jun-2021 | HK2124460-007 | | 1.5 | ---- | ---- | ---- | ---- |
| F1-ME-S-2 | 25-Jun-2021 | HK2124460-008 | | 1.2 | ---- | ---- | ---- | ---- |
| F1-ME-M-1 | 25-Jun-2021 | HK2124460-009 | | 1.1 | ---- | ---- | ---- | ---- |
| F1-ME-M-2 | 25-Jun-2021 | HK2124460-010 | | 1.4 | ---- | ---- | ---- | ---- |
| F1-ME-B-1 | 25-Jun-2021 | HK2124460-011 | | 2.6 | ---- | ---- | ---- | ---- |
| F1-ME-B-2 | 25-Jun-2021 | HK2124460-012 | | 2.4 | ---- | ---- | ---- | ---- |
| IM3-ME-S-1 | 25-Jun-2021 | HK2124460-013 | | 1.2 | ---- | ---- | ---- | ---- |
| IM3-ME-S-2 | 25-Jun-2021 | HK2124460-014 | | 1.5 | ---- | ---- | ---- | ---- |
| IM3-ME-B-1 | 25-Jun-2021 | HK2124460-017 | | 1.7 | ---- | ---- | ---- | ---- |
| IM3-ME-B-2 | 25-Jun-2021 | HK2124460-018 | | 2.1 | ---- | ---- | ---- | ---- |
| G3-ME-S-1 | 25-Jun-2021 | HK2124460-019 | | 1.7 | ---- | ---- | ---- | ---- |
| G3-ME-S-2 | 25-Jun-2021 | HK2124460-020 | | 1.5 | ---- | ---- | ---- | ---- |
| G3-ME-M-1 | 25-Jun-2021 | HK2124460-021 | | 1.1 | ---- | ---- | ---- | ---- |
| G3-ME-M-2 | 25-Jun-2021 | HK2124460-022 | | 1.3 | ---- | ---- | ---- | ---- |
| G3-ME-B-1 | 25-Jun-2021 | HK2124460-023 | | 0.9 | ---- | ---- | ---- | ---- |
| G3-ME-B-2 | 25-Jun-2021 | HK2124460-024 | | 0.7 | ---- | ---- | ---- | ---- |
| E1-MF-S-1 | 25-Jun-2021 | HK2124460-025 | | 1.4 | ---- | ---- | ---- | ---- |
| E1-MF-S-2 | 25-Jun-2021 | HK2124460-026 | | 1.1 | ---- | ---- | ---- | ---- |
| E1-MF-M-1 | 25-Jun-2021 | HK2124460-027 | | 1.5 | ---- | ---- | ---- | ---- |
| E1-MF-M-2 | 25-Jun-2021 | HK2124460-028 | | 1.3 | ---- | ---- | ---- | ---- |
| E1-MF-B-1 | 25-Jun-2021 | HK2124460-029 | | 3.0 | ---- | ---- | ---- | ---- |
| E1-MF-B-2 | 25-Jun-2021 | HK2124460-030 | | 3.2 | ---- | ---- | ---- | ---- |
| F1-MF-S-1 | 25-Jun-2021 | HK2124460-031 | | 1.4 | ---- | ---- | ---- | ---- |
| F1-MF-S-2 | 25-Jun-2021 | HK2124460-032 | | 1.7 | ---- | ---- | ---- | ---- |
| F1-MF-M-1 | 25-Jun-2021 | HK2124460-033 | | 2.2 | ---- | ---- | ---- | ---- |

Sub-Matrix: **MARINE WATER**

| | | | *Compound* | **EA025: Suspended Solids (SS)** | **----** | **----** | **----** | **----** |
|---|---|---|---|---|---|---|---|---|
| | | | *LOR Unit* | 0.5 mg/L | ---- | ---- | ---- | ---- |
| *Sample ID* | *Sampling date / time* | *Laboratory sample ID* | | EA/ED: Physical and Aggregate Properties | ---- | ---- | ---- | ---- |
| **F1-MF-M-2** | 25-Jun-2021 | HK2124460-034 | | **1.9** | **----** | **----** | **----** | **----** |
| **F1-MF-B-1** | 25-Jun-2021 | HK2124460-035 | | **2.6** | **----** | **----** | **----** | **----** |
| **F1-MF-B-2** | 25-Jun-2021 | HK2124460-036 | | **1.9** | **----** | **----** | **----** | **----** |
| **IM3-MF-S-1** | 25-Jun-2021 | HK2124460-037 | | **1.6** | **----** | **----** | **----** | **----** |
| **IM3-MF-S-2** | 25-Jun-2021 | HK2124460-038 | | **2.4** | **----** | **----** | **----** | **----** |
| **IM3-MF-B-1** | 25-Jun-2021 | HK2124460-041 | | **2.2** | **----** | **----** | **----** | **----** |
| **IM3-MF-B-2** | 25-Jun-2021 | HK2124460-042 | | **1.4** | **----** | **----** | **----** | **----** |
| **G3-MF-S-1** | 25-Jun-2021 | HK2124460-043 | | **2.0** | **----** | **----** | **----** | **----** |
| **G3-MF-S-2** | 25-Jun-2021 | HK2124460-044 | | **1.4** | **----** | **----** | **----** | **----** |
| **G3-MF-M-1** | 25-Jun-2021 | HK2124460-045 | | **1.8** | **----** | **----** | **----** | **----** |
| **G3-MF-M-2** | 25-Jun-2021 | HK2124460-046 | | **1.4** | **----** | **----** | **----** | **----** |
| **G3-MF-B-1** | 25-Jun-2021 | HK2124460-047 | | **1.0** | **----** | **----** | **----** | **----** |
| **G3-MF-B-2** | 25-Jun-2021 | HK2124460-048 | | **1.6** | **----** | **----** | **----** | **----** |

## Laboratory Duplicate (DUP) Report

Matrix: **WATER**

| Laboratory sample ID | Sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3760519)** | | | | | | | | |
| HK2124460-001 | E1-ME-S-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 2.4 | 2.2 | 12.0 |
| HK2124460-011 | F1-ME-B-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 2.6 | 2.3 | 13.1 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3760520)** | | | | | | | | |
| HK2124460-023 | G3-ME-B-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 0.9 | 0.9 | 0.0 |
| HK2124460-033 | F1-MF-M-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 2.2 | 2.4 | 7.7 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 3760521)** | | | | | | | | |
| HK2124460-045 | G3-MF-M-1 | EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | 1.8 | 1.6 | 13.3 |

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

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPDs (%) | |
| | | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3760519)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 105 | ---- | 85.9 | 117 | ---- | ---- |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3760520)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 102 | ---- | 85.9 | 117 | ---- | ---- |
| **EA/ED: Physical and Aggregate Properties (QCLot: 3760521)** | | | | | | | | | | | |
| EA025: Suspended Solids (SS) | ---- | 0.5 | mg/L | <0.5 | 20 mg/L | 106 | ---- | 85.9 | 117 | ---- | ---- |

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

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

# APPENDIX D POST PROJECT WATER QUALITY MONITORING RESULTS (ZONE B)

**Water Quality Monitoring Data Log Sheet** **21-Jun-2021** **Tide: Mid-Ebb**

| Monitoring Station | Weather Condition | Sea Condition** | Sampling Time | Water Depth (m) | Depth Level *** | Current Velocity (m/s) | CurrentDirection | Temperature ($^{o}$C) | | Salinity (ppt) | | pH | | DO Saturation (%) | | Dissolved Oxygen (mg/L) | | | Turbidity(NTU) | | | Suspended Solids (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | DA* | Value | Average | DA* | Value | Average | DA* |
| E1 | Cloudy | Rough | 09:42 | 25.2 | S | 0.50 | 78 | 28.9 | 28.9 | 28.14 | 28.14 | 8.43 | 8.43 | 135.5 | 135.4 | 8.93 | 8.93 | 5.92 | 1.84 | 1.85 | 2.10 | 4.6 | 5.0 | 4.9 |
| | | | | | | 0.51 | 82 | 28.9 | | 28.14 | | 8.42 | | 135.3 | | 8.92 | | | 1.85 | | | 5.4 | | |
| | | | | | M | 0.49 | 106 | 24.5 | 24.6 | 34.24 | 34.24 | 7.94 | 7.94 | 42.4 | 42.4 | 2.91 | 2.91 | | 1.73 | 1.71 | | 4.9 | 5.1 | |
| | | | | | | 0.51 | 114 | 24.6 | | 34.24 | | 7.94 | | 42.3 | | 2.90 | | | 1.68 | | | 5.2 | | |
| | | | | | B | 0.28 | 75 | 24.0 | 24.0 | 34.39 | 34.39 | 7.92 | 7.92 | 45.6 | 45.7 | 3.15 | 3.15 | | 2.95 | 2.74 | | 4.7 | 4.8 | |
| | | | | | | 0.29 | 79 | 24.0 | | 34.39 | | 7.92 | | 45.7 | | 3.15 | | | 2.52 | | | 4.8 | | |
| F1 | Cloudy | Rough | 10:47 | 34.2 | S | 0.51 | 66 | 29.5 | 29.5 | 28.38 | 28.38 | 8.41 | 8.41 | 121.6 | 121.5 | 7.93 | 7.93 | 6.15 | 1.58 | 1.57 | 2.06 | 4.6 | 4.4 | 3.9 |
| | | | | | | 0.53 | 70 | 29.5 | | 28.38 | | 8.41 | | 121.3 | | 7.92 | | | 1.56 | | | 4.2 | | |
| | | | | | M | 0.21 | 39 | 24.2 | 24.2 | 34.40 | 34.40 | 8.07 | 8.07 | 63.7 | 63.5 | 4.39 | 4.38 | | 2.23 | 2.23 | | 3.9 | 3.7 | |
| | | | | | | 0.22 | 39 | 24.2 | | 34.40 | | 8.07 | | 63.3 | | 4.36 | | | 2.22 | | | 3.5 | | |
| | | | | | B | 0.23 | 269 | 24.2 | 24.2 | 34.47 | 34.47 | 8.13 | 8.14 | 71.9 | 72.0 | 4.95 | 4.96 | | 2.39 | 2.39 | | 3.4 | 3.6 | |
| | | | | | | 0.24 | 281 | 24.2 | | 34.47 | | 8.14 | | 72.0 | | 4.96 | | | 2.39 | | | 3.8 | | |
| IM3 | Cloudy | Rough | 10:14 | 5.2 | S | 0.12 | 12 | 29.4 | 29.4 | 28.07 | 28.08 | 8.48 | 8.48 | 126.7 | 126.8 | 8.29 | 8.30 | 8.30 | 2.33 | 2.32 | 2.37 | 4.7 | 5.0 | 3.6 |
| | | | | | | 0.13 | 12 | 29.4 | | 28.09 | | 8.48 | | 126.9 | | 8.30 | | | 2.31 | | | 5.2 | | |
| | | | | | M | 0.00 | 0 | | - | | - | | - | | - | | - | | | - | | 0.0 | 0.0 | |
| | | | | | | 0.00 | 0 | | | | | | | | | | | | | | | 0.0 | | |
| | | | | | B | 0.04 | 20 | 29.2 | 29.2 | 28.24 | 28.24 | 8.47 | 8.47 | 127.2 | 127.3 | 8.34 | 8.34 | | 2.39 | 2.42 | | 5.5 | 5.8 | |
| | | | | | | 0.04 | 20 | 29.2 | | 28.23 | | 8.47 | | 127.3 | | 8.34 | | | 2.45 | | | 6.0 | | |
| G3 | Cloudy | Rough | 10:06 | 24.6 | S | 0.41 | 106 | 29.1 | 29.1 | 27.87 | 27.87 | 8.49 | 8.49 | 144.5 | 144.5 | 9.51 | 9.51 | 6.32 | 1.74 | 1.75 | 2.26 | 5.0 | 5.1 | 4.9 |
| | | | | | | 0.45 | 106 | 29.1 | | 27.87 | | 8.49 | | 144.4 | | 9.50 | | | 1.75 | | | 5.2 | | |
| | | | | | M | 0.22 | 113 | 24.2 | 24.2 | 34.36 | 34.36 | 8.01 | 8.01 | 45.4 | 45.5 | 3.13 | 3.14 | | 2.36 | 2.37 | | 5.1 | 5.2 | |
| | | | | | | 0.23 | 118 | 24.2 | | 34.36 | | 8.01 | | 45.6 | | 3.14 | | | 2.38 | | | 5.3 | | |
| | | | | | B | 0.30 | 116 | 24.1 | 24.1 | 34.31 | 34.31 | 8.02 | 8.02 | 48.6 | 48.7 | 3.36 | 3.36 | | 2.56 | 2.67 | | 4.0 | 4.3 | |
| | | | | | | 0.30 | 125 | 24.1 | | 34.31 | | 8.02 | | 48.7 | | 3.36 | | | 2.77 | | | 4.6 | | |

**Remark: * DA: Depth-Averaged**

***** S: 1 m below the sea surface; M: mid-depth; S: 1 m above the seabed**

**Water Quality Monitoring Data Log Sheet** **21-Jun-2021** **Tide: Mid-Flood**

| Monitoring Station | Weather Condition | Sea Condition** | Sampling Time | Water Depth (m) | Depth Level *** | Current Velocity (m/s) | CurrentDirection | Temperature (°C) | | Salinity (ppt) | | pH | | DO Saturation (%) | | Dissolved Oxygen (mg/L) | | | Turbidity(NTU) | | | Suspended Solids (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | DA* | Value | Average | DA* | Value | Average | DA* |
| E1 | Cloudy | Rough | 15:21 | 25.5 | S | 0.19 | 36 | 29.3 | 29.3 | 28.53 | 28.53 | 8.50 | 8.50 | 145.0 | 144.7 | 9.48 | 9.46 | 6.24 | 1.96 | 1.97 | 2.17 | 4.1 | 4.6 | 4.9 |
| | | | | | | 0.20 | 38 | 29.3 | | 28.52 | | 8.50 | | 144.4 | | 9.44 | | | 1.98 | | | 5.0 | | |
| | | | | | M | 0.18 | 346 | 25.7 | 25.7 | 33.46 | 33.49 | 7.99 | 8.00 | 44.2 | 44.3 | 2.99 | 3.02 | | 1.95 | 2.01 | | 4.8 | 4.9 | |
| | | | | | | 0.19 | 318.32 | 25.6 | | 33.52 | | 8.00 | | 44.4 | | 3.05 | | | 2.06 | | | 5.0 | | |
| | | | | | B | 0.23 | 359 | 24.2 | 24.3 | 34.39 | 34.42 | 8.01 | 8.01 | 55.1 | 55.3 | 3.79 | 3.80 | | 2.60 | 2.54 | | 5.6 | 5.2 | |
| | | | | | | 0.24 | 330.28 | 24.3 | | 34.45 | | 8.01 | | 55.4 | | 3.81 | | | 2.48 | | | 4.8 | | |
| F1 | Cloudy | Rough | 13:54 | 34.6 | S | 0.18 | 42 | 29.6 | 29.6 | 28.57 | 28.57 | 8.47 | 8.47 | 140.4 | 140.3 | 9.13 | 9.13 | 6.64 | 1.65 | 1.66 | 2.31 | 4.0 | 3.8 | 3.6 |
| | | | | | | 0.20 | 42 | 29.6 | | 28.57 | | 8.47 | | 140.2 | | 9.12 | | | 1.66 | | | 3.6 | | |
| | | | | | M | 0.11 | 300 | 24.2 | 24.2 | 34.43 | 34.44 | 8.06 | 8.06 | 60.1 | 60.4 | 4.14 | 4.16 | | 2.63 | 2.64 | | 3.5 | 3.7 | |
| | | | | | | 0.12 | 320 | 24.2 | | 34.44 | | 8.06 | | 60.6 | | 4.18 | | | 2.64 | | | 3.9 | | |
| | | | | | B | 0.24 | 229 | 24.1 | 24.1 | 34.50 | 34.48 | 8.10 | 8.08 | 65.1 | 65.0 | 4.60 | 4.54 | | 2.60 | 2.65 | | 3.3 | 3.4 | |
| | | | | | | 0.26 | 246 | 24.1 | | 34.45 | | 8.06 | | 64.9 | | 4.47 | | | 2.69 | | | 3.5 | | |
| IM3 | Cloudy | Rough | 14:46 | 4.7 | S | 0.03 | 272 | 30.6 | 30.6 | 27.91 | 27.91 | 8.51 | 8.51 | 145.0 | 145.2 | 9.32 | 9.33 | 9.33 | 2.72 | 2.70 | 2.46 | 7.0 | 6.8 | 4.6 |
| | | | | | | 0.03 | 284 | 30.6 | | 27.91 | | 8.51 | | 145.3 | | 9.34 | | | 2.68 | | | 6.6 | | |
| | | | | | M | 0.00 | 0 | | - | | - | | - | | - | | - | | | - | | 0.0 | 0.0 | |
| | | | | | | 0.00 | 0 | | | | | | | | | | | | | | | 0.0 | | |
| | | | | | B | 0.05 | 21 | 29.3 | 29.3 | 28.45 | 28.46 | 8.46 | 8.46 | 143.7 | 143.5 | 9.39 | 9.38 | | 2.22 | 2.22 | | 6.5 | 6.9 | |
| | | | | | | 0.05 | 21 | 29.3 | | 28.47 | | 8.46 | | 143.2 | | 9.37 | | | 2.21 | | | 7.2 | | |
| G3 | Cloudy | Rough | 14:55 | 24.5 | S | 0.24 | 98 | 29.4 | 29.4 | 28.57 | 28.57 | 8.53 | 8.53 | 152.5 | 152.4 | 9.95 | 9.94 | 6.45 | 1.76 | 1.77 | 1.97 | 4.4 | 4.6 | 4.9 |
| | | | | | | 0.25 | 102 | 29.4 | | 28.57 | | 8.53 | | 152.2 | | 9.93 | | | 1.78 | | | 4.7 | | |
| | | | | | M | 0.33 | 59 | 24.8 | 24.8 | 34.17 | 34.17 | 8.01 | 8.01 | 43.2 | 43.3 | 2.95 | 2.96 | | 1.54 | 1.54 | | 4.4 | 4.6 | |
| | | | | | | 0.33 | 63 | 24.8 | | 34.17 | | 8.01 | | 43.3 | | 2.96 | | | 1.54 | | | 4.8 | | |
| | | | | | B | 0.31 | 88 | 24.1 | 24.1 | 34.39 | 34.39 | 8.04 | 8.04 | 51.6 | 51.7 | 3.56 | 3.57 | | 2.63 | 2.61 | | 5.2 | 5.4 | |
| | | | | | | 0.32 | 91 | 24.1 | | 34.38 | | 8.04 | | 51.7 | | 3.57 | | | 2.58 | | | 5.6 | | |

**Remark: * DA: Depth-Averaged**

***** S: 1 m below the sea surface; M: mid-depth; S: 1 m above the seabed**

**Water Quality Monitoring Data Log Sheet** **23-Jun-2021** **Tide: Mid-Ebb**

| Monitoring Station | Weather Condition | Sea Condition** | Sampling Time | Water Depth (m) | Depth Level *** | Current Velocity (m/s) | CurrentDirection | Temperature (°C) | | Salinity (ppt) | | pH | | DO Saturation (%) | | Dissolved Oxygen (mg/L) | | | Turbidity(NTU) | | | Suspended Solids (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | DA* | Value | Average | DA* | Value | Average | DA* |
| E1 | Rainy | Rough | 11:38 | 24.3 | S | 0.39 | 114 | 27.2 | 27.2 | 30.84 | 30.86 | 8.22 | 8.22 | 87.8 | 87.8 | 5.87 | 5.87 | 5.41 | 1.85 | 1.84 | 3.45 | 1.9 | 1.6 | 1.8 |
| | | | | | | 0.42 | 114 | 27.2 | | 30.88 | | 8.22 | | 87.7 | | 5.86 | | | 1.83 | | | 1.3 | | |
| | | | | | M | 0.38 | 84 | 24.2 | 24.2 | 34.55 | 34.55 | 8.10 | 8.10 | 72.1 | 72.2 | 4.96 | 4.96 | | 3.71 | 3.75 | | 1.2 | 1.6 | |
| | | | | | | 0.41 | 91 | 24.2 | | 34.55 | | 8.10 | | 72.2 | | 4.96 | | | 3.78 | | | 2.0 | | |
| | | | | | B | 0.35 | 78 | 24.2 | 24.2 | 34.56 | 34.56 | 8.06 | 8.06 | 73.3 | 73.4 | 5.05 | 5.06 | | 4.77 | 4.75 | | 1.7 | 2.3 | |
| | | | | | | 0.38 | 83 | 24.2 | | 34.56 | | 8.06 | | 73.5 | | 5.06 | | | 4.73 | | | 2.8 | | |
| F1 | Rainy | Rough | 12:51 | 34 | S | 0.49 | 56 | 27.9 | 27.9 | 30.67 | 30.67 | 8.30 | 8.31 | 100.4 | 100.3 | 6.64 | 6.64 | 5.79 | 1.68 | 1.68 | 2.50 | 2.0 | 2.4 | 2.3 |
| | | | | | | 0.52 | 59 | 27.9 | | 30.67 | | 8.31 | | 100.2 | | 6.63 | | | 1.68 | | | 2.7 | | |
| | | | | | M | 0.05 | 192 | 24.2 | 24.2 | 34.51 | 34.52 | 8.17 | 8.17 | 71.6 | 71.7 | 4.93 | 4.94 | | 2.71 | 2.72 | | 2.3 | 2.4 | |
| | | | | | | 0.05 | 205 | 24.2 | | 34.52 | | 8.17 | | 71.8 | | 4.94 | | | 2.73 | | | 2.5 | | |
| | | | | | B | 0.10 | 222 | 23.8 | 23.9 | 34.63 | 34.62 | 8.20 | 8.20 | 80.9 | 80.6 | 5.60 | 5.58 | | 3.14 | 3.10 | | 1.8 | 2.1 | |
| | | | | | | 0.10 | 228 | 23.9 | | 34.60 | | 8.19 | | 80.3 | | 5.56 | | | 3.06 | | | 2.4 | | |
| IM3 | Rainy | Moderate | 12:13 | 4.6 | S | 0.18 | 31 | 27.5 | 27.5 | 29.65 | 29.68 | 8.35 | 8.35 | 107.5 | 107.5 | 7.19 | 7.19 | 7.19 | 2.05 | 2.06 | 2.26 | 1.4 | 1.7 | 1.4 |
| | | | | | | 0.19 | 32 | 27.5 | | 29.70 | | 8.35 | | 107.4 | | 7.19 | | | 2.07 | | | 2.0 | | |
| | | | | | M | 0.00 | 0 | | - | | - | | - | | - | | - | | | - | | 0.0 | 0.0 | |
| | | | | | | 0.00 | 0 | | | | | | | | | | | | | | | 0.0 | | |
| | | | | | B | 0.05 | 5 | 27.0 | 27.0 | 30.82 | 30.82 | 8.24 | 8.24 | 84.1 | 84.1 | 5.64 | 5.64 | | 2.46 | 2.46 | | 2.8 | 2.6 | |
| | | | | | | 0.05 | 5 | 27.0 | | 30.82 | | 8.24 | | 84.1 | | 5.64 | | | 2.46 | | | 2.3 | | |
| G3 | Rainy | Rough | 12:02 | 24.8 | S | 0.24 | 174 | 27.5 | 27.5 | 30.14 | 30.16 | 8.30 | 8.30 | 99.4 | 99.4 | 6.64 | 6.64 | 5.39 | 1.78 | 1.78 | 2.88 | 2.7 | 2.6 | 2.3 |
| | | | | | | 0.24 | 186 | 27.5 | | 30.17 | | 8.30 | | 99.3 | | 6.63 | | | 1.78 | | | 2.5 | | |
| | | | | | M | 0.29 | 120 | 24.6 | 24.6 | 34.35 | 34.37 | 8.12 | 8.13 | 60.2 | 60.3 | 4.13 | 4.14 | | 2.61 | 2.71 | | 2.0 | 2.3 | |
| | | | | | | 0.06 | 122 | 24.5 | | 34.39 | | 8.13 | | 60.3 | | 4.14 | | | 2.81 | | | 2.6 | | |
| | | | | | B | 0.05 | 188 | 24.1 | 24.1 | 34.57 | 34.57 | 8.14 | 8.14 | 69.6 | 69.7 | 4.80 | 4.81 | | 4.15 | 4.15 | | 1.8 | 2.0 | |
| | | | | | | 0.05 | 199 | 24.1 | | 34.57 | | 8.14 | | 69.8 | | 4.81 | | | 4.14 | | | 2.2 | | |

**Remark: * DA: Depth-Averaged**

***** S: 1 m below the sea surface; M: mid-depth; S: 1 m above the seabed**

**Water Quality Monitoring Data Log Sheet** **23-Jun-2021** **Tide: Mid-Flood**

| Monitoring Station | Weather Condition | Sea Condition** | Sampling Time | Water Depth (m) | Depth Level *** | Current Velocity (m/s) | CurrentDirection | Temperature (°C) | | Salinity (ppt) | | pH | | DO Saturation (%) | | Dissolved Oxygen (mg/L) | | | Turbidity(NTU) | | | Suspended Solids (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | DA* | Value | Average | DA* | Value | Average | DA* |
| E1 | Rainy | Rough | 17:27 | 24.6 | S | 0.13 | 190 | 27.3 | 27.3 | 30.56 | 30.56 | 8.25 | 8.25 | 85.1 | 85.1 | 5.68 | 5.68 | 4.79 | 1.47 | 1.47 | 3.17 | 1.1 | 1.5 | 2.4 |
| | | | | | | 0.14 | 194 | 27.3 | | 30.56 | | 8.25 | | 85.1 | | 5.68 | | | 1.47 | | | 1.9 | | |
| | | | | | M | 0.30 | 271 | 24.6 | 24.6 | 34.33 | 34.35 | 8.09 | 8.09 | 56.7 | 56.8 | 3.88 | 3.89 | | 2.80 | 2.85 | | 2.1 | 2.6 | |
| | | | | | | 0.31 | 286 | 24.5 | | 34.37 | | 8.09 | | 56.9 | | 3.90 | | | 2.90 | | | 3.0 | | |
| | | | | | B | 0.44 | 227 | 24.3 | 24.3 | 34.53 | 34.53 | 8.12 | 8.12 | 64.3 | 64.3 | 4.42 | 4.42 | | 5.20 | 5.20 | | 3.4 | 3.1 | |
| | | | | | | 0.44 | 237 | 24.3 | | 34.53 | | 8.12 | | 64.3 | | 4.42 | | | 5.20 | | | 2.8 | | |
| F1 | Rainy | Rough | 16:04 | 33.9 | S | 0.13 | 196 | 27.9 | 27.9 | 30.52 | 30.53 | 8.32 | 8.32 | 102.6 | 102.8 | 6.79 | 6.81 | 5.99 | 1.41 | 1.41 | 2.66 | 1.4 | 1.9 | 2.4 |
| | | | | | | 0.13 | 201 | 27.9 | | 30.53 | | 8.32 | | 103.0 | | 6.82 | | | 1.40 | | | 2.3 | | |
| | | | | | M | 0.32 | 332 | 24.1 | 24.1 | 34.56 | 34.57 | 8.21 | 8.21 | 74.7 | 74.9 | 5.15 | 5.17 | | 2.61 | 2.61 | | 2.7 | 2.4 | |
| | | | | | | 0.34 | 338 | 24.1 | | 34.57 | | 8.21 | | 75.1 | | 5.18 | | | 2.61 | | | 2.1 | | |
| | | | | | B | 0.41 | 326 | 23.4 | 23.4 | 34.70 | 34.70 | 8.25 | 8.26 | 83.3 | 83.3 | 5.81 | 5.81 | | 3.93 | 3.95 | | 2.6 | 3.0 | |
| | | | | | | 0.45 | 336 | 23.4 | | 34.70 | | 8.27 | | 83.2 | | 5.81 | | | 3.97 | | | 3.4 | | |
| IM3 | Rainy | Moderate | 16:56 | 4.3 | S | 0.12 | 127 | 27.4 | 27.4 | 29.57 | 29.62 | 8.33 | 8.33 | 106.4 | 106.4 | 7.14 | 7.14 | 7.14 | 1.78 | 1.78 | 1.81 | 1.7 | 2.0 | 1.9 |
| | | | | | | 0.12 | 127 | 27.4 | | 29.66 | | 8.32 | | 106.3 | | 7.13 | | | 1.77 | | | 2.3 | | |
| | | | | | M | 0.00 | 0 | | - | | - | | - | | - | | - | | | - | | 0.0 | 0.0 | |
| | | | | | | 0.00 | 0 | | | | | | | | | | | | | | | 0.0 | | |
| | | | | | B | 0.02 | 132 | 27.2 | 27.2 | 30.59 | 30.60 | 8.28 | 8.28 | 93.1 | 93.1 | 6.23 | 6.23 | | 1.86 | 1.85 | | 4.0 | 3.8 | |
| | | | | | | 0.02 | 132 | 27.2 | | 30.60 | | 8.28 | | 93.1 | | 6.23 | | | 1.84 | | | 3.5 | | |
| G3 | Rainy | Rough | 16:45 | 24.8 | S | 0.36 | 192 | 27.2 | 27.2 | 29.64 | 29.65 | 8.34 | 8.34 | 100.4 | 100.4 | 6.75 | 6.75 | 5.83 | 1.50 | 1.51 | 2.55 | 3.1 | 3.7 | 3.0 |
| | | | | | | 0.36 | 195 | 27.2 | | 29.66 | | 8.34 | | 100.3 | | 6.74 | | | 1.51 | | | 4.2 | | |
| | | | | | M | 0.08 | 256 | 26.2 | 26.2 | 33.51 | 33.45 | 8.18 | 8.18 | 73.5 | 73.5 | 4.92 | 4.92 | | 2.29 | 2.36 | | 2.6 | 2.8 | |
| | | | | | | 0.29 | 269 | 26.2 | | 33.39 | | 8.18 | | 73.4 | | 4.91 | | | 2.43 | | | 3.0 | | |
| | | | | | B | 0.27 | 223 | 24.2 | 24.2 | 34.57 | 34.57 | 8.19 | 8.19 | 73.1 | 73.1 | 5.03 | 5.03 | | 3.77 | 3.78 | | 2.8 | 2.6 | |
| | | | | | | 0.28 | 229 | 24.2 | | 34.57 | | 8.19 | | 73.1 | | 5.03 | | | 3.78 | | | 2.3 | | |

**Remark: * DA: Depth-Averaged**

***** S: 1 m below the sea surface; M: mid-depth; S: 1 m above the seabed**

**Water Quality Monitoring Data Log Sheet** **25-Jun-2021** **Tide: Mid-Ebb**

| Monitoring Station | Weather Condition | Sea Condition** | Sampling Time | Water Depth (m) | Depth Level *** | Current Velocity (m/s) | CurrentDirection | Temperature ($^{o}$C) | | Salinity (ppt) | | pH | | DO Saturation (%) | | Dissolved Oxygen (mg/L) | | | Turbidity(NTU) | | | Suspended Solids (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | DA* | Value | Average | DA* | Value | Average | DA* |
| E1 | Fine | Moderate | 12:34 | 24.8 | S | 0.41 | 109 | 25.7 | 25.7 | 31.97 | 31.99 | 8.14 | 8.14 | 82.3 | 82.2 | 5.60 | 5.60 | 5.24 | 1.54 | 1.54 | 3.15 | 2.4 | 2.2 | 1.8 |
| | | | | | | 0.44 | 112 | 25.7 | | 32.01 | | 8.14 | | 82.1 | | 5.59 | | | 1.54 | | | 2.0 | | |
| | | | | | M | 0.40 | 110 | 24.0 | 24.0 | 34.31 | 34.31 | 8.16 | 8.16 | 70.5 | 70.6 | 4.88 | 4.88 | | 2.39 | 2.39 | | 1.9 | 1.8 | |
| | | | | | | 0.42 | 113 | 24.0 | | 34.31 | | 8.16 | | 70.6 | | 4.88 | | | 2.39 | | | 1.7 | | |
| | | | | | B | 0.38 | 97 | 24.0 | 24.0 | 34.59 | 34.60 | 8.18 | 8.18 | 73.2 | 73.3 | 5.06 | 5.07 | | 5.52 | 5.53 | | 1.5 | 1.4 | |
| | | | | | | 0.41 | 101 | 24.0 | | 34.60 | | 8.18 | | 73.3 | | 5.07 | | | 5.53 | | | 1.2 | | |
| F1 | Fine | Moderate | 13:51 | 33.8 | S | 0.44 | 59 | 26.1 | 26.1 | 32.09 | 32.09 | 8.28 | 8.28 | 108.3 | 108.2 | 7.31 | 7.31 | 6.32 | 1.38 | 1.38 | 3.29 | 1.5 | 1.4 | 1.7 |
| | | | | | | 0.47 | 60 | 26.1 | | 32.09 | | 8.28 | | 108.1 | | 7.30 | | | 1.38 | | | 1.2 | | |
| | | | | | M | 0.12 | 79 | 23.7 | 23.7 | 34.62 | 34.62 | 8.17 | 8.17 | 76.8 | 76.9 | 5.34 | 5.34 | | 2.23 | 2.23 | | 1.1 | 1.3 | |
| | | | | | | 0.12 | 86 | 23.7 | | 34.62 | | 8.17 | | 76.9 | | 5.34 | | | 2.23 | | | 1.4 | | |
| | | | | | B | 0.11 | 102 | 23.4 | 23.4 | 34.71 | 34.71 | 8.18 | 8.18 | 79.4 | 79.4 | 5.54 | 5.54 | | 5.97 | 6.27 | | 2.6 | 2.5 | |
| | | | | | | 0.12 | 110 | 23.4 | | 34.71 | | 8.18 | | 79.4 | | 5.54 | | | 6.56 | | | 2.4 | | |
| IM3 | Fine | Moderate | 13:08 | 4.8 | S | 0.00 | 186 | 26.1 | 26.1 | 31.51 | 31.51 | 8.25 | 8.25 | 101.9 | 101.7 | 6.90 | 6.89 | 6.89 | 1.50 | 1.50 | 1.56 | 1.2 | 1.4 | 1.1 |
| | | | | | | 0.00 | 189 | 26.1 | | 31.51 | | 8.25 | | 101.5 | | 6.88 | | | 1.50 | | | 1.5 | | |
| | | | | | M | 0.00 | 0 | | - | | - | | - | | - | | - | | | - | | 0.0 | 0.0 | |
| | | | | | | 0.00 | 0 | | | | | | | | | | | | | | | 0.0 | | |
| | | | | | B | 0.04 | 19 | 25.8 | 25.8 | 32.02 | 32.03 | 8.21 | 8.21 | 92.3 | 92.4 | 6.28 | 6.28 | | 1.63 | 1.63 | | 1.7 | 1.9 | |
| | | | | | | 0.04 | 19 | 25.8 | | 32.03 | | 8.21 | | 92.4 | | 6.28 | | | 1.62 | | | 2.1 | | |
| G3 | Fine | Moderate | 12:56 | 30.1 | S | 0.25 | 154 | 25.8 | 25.8 | 31.93 | 31.94 | 8.14 | 8.14 | 80.8 | 80.8 | 5.49 | 5.49 | 5.19 | 1.42 | 1.43 | 3.39 | 1.7 | 1.6 | 1.2 |
| | | | | | | 0.25 | 169 | 25.8 | | 31.95 | | 8.14 | | 80.8 | | 5.49 | | | 1.43 | | | 1.5 | | |
| | | | | | M | 0.26 | 133 | 23.8 | 23.8 | 34.52 | 34.52 | 8.16 | 8.16 | 70.5 | 70.5 | 4.89 | 4.89 | | 3.20 | 3.20 | | 1.1 | 1.2 | |
| | | | | | | 0.11 | 139 | 23.8 | | 34.52 | | 8.16 | | 70.5 | | 4.89 | | | 3.20 | | | 1.3 | | |
| | | | | | B | 0.11 | 176 | 23.7 | 23.7 | 34.57 | 34.57 | 8.16 | 8.16 | 71.6 | 71.7 | 4.97 | 4.97 | | 5.63 | 5.56 | | 0.9 | 0.8 | |
| | | | | | | 0.12 | 180 | 23.7 | | 34.57 | | 8.16 | | 71.7 | | 4.97 | | | 5.48 | | | 0.7 | | |

**Remark: * DA: Depth-Averaged**

***** S: 1 m below the sea surface; M: mid-depth; S: 1 m above the seabed**

**Water Quality Monitoring Data Log Sheet** **25-Jun-2021** **Tide: Mid-Flood**

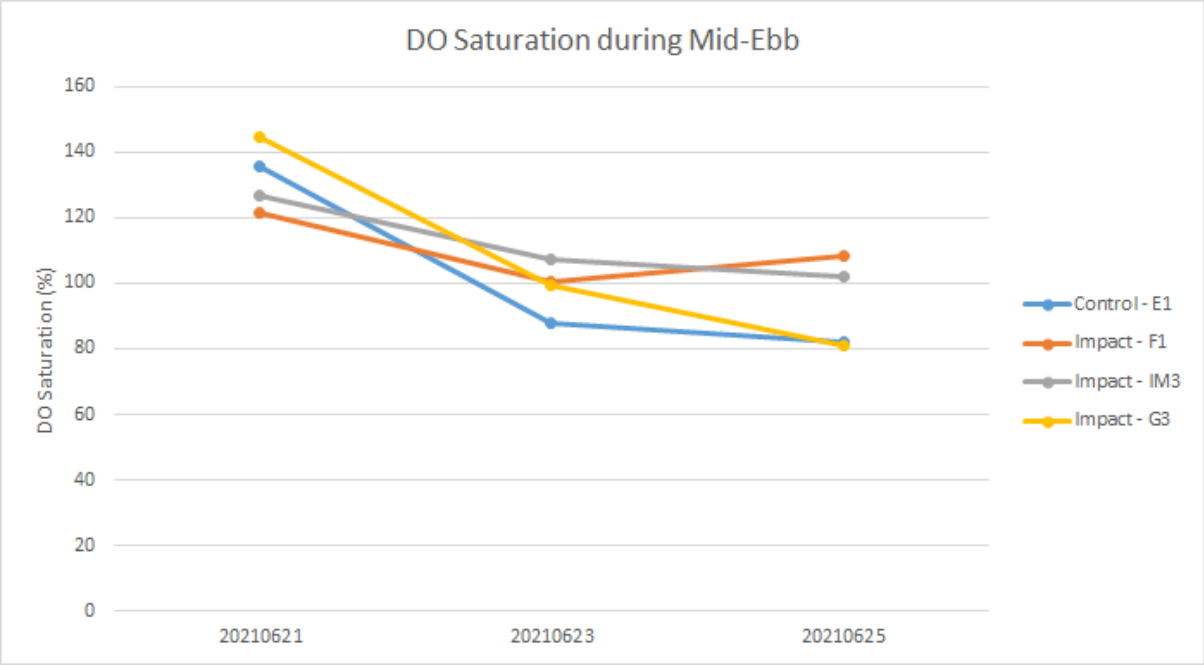
| Monitoring Station | Weather Condition | Sea Condition** | Sampling Time | Water Depth (m) | Depth Level *** | Current Velocity (m/s) | CurrentDirection | Temperature ($^{o}$C) | | Salinity (ppt) | | pH | | DO Saturation (%) | | Dissolved Oxygen (mg/L) | | | Turbidity(NTU) | | | Suspended Solids (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Value | Average | Value | Average | Value | Average | Value | Average | Value | Average | DA* | Value | Average | DA* | Value | Average | DA* |
| E1 | Fine | Moderate | 19:17 | 24.6 | S | 0.22 | 177 | 26.9 | 26.9 | 30.36 | 30.37 | 8.25 | 8.25 | 105.5 | 105.3 | 7.10 | 7.09 | 5.63 | 1.46 | 1.47 | 2.30 | 1.4 | 1.3 | 1.9 |
| | | | | | | 0.22 | 177 | 26.9 | | 30.37 | | 8.25 | | 105.1 | | 7.07 | | | 1.48 | | | 1.1 | | |
| | | | | | M | 0.29 | 191 | 25.0 | 25.0 | 33.48 | 33.49 | 8.10 | 8.10 | 61.0 | 61.0 | 4.17 | 4.17 | | 2.67 | 2.68 | | 1.5 | 1.4 | |
| | | | | | | 0.29 | 196 | 25.0 | | 33.49 | | 8.10 | | 61.0 | | 4.17 | | | 2.69 | | | 1.3 | | |
| | | | | | B | 0.34 | 217 | 24.3 | 24.3 | 34.39 | 34.41 | 8.17 | 8.17 | 74.3 | 74.3 | 5.11 | 5.11 | | 2.73 | 2.76 | | 3.0 | 3.1 | |
| | | | | | | 0.37 | 224 | 24.3 | | 34.42 | | 8.17 | | 74.3 | | 5.10 | | | 2.79 | | | 3.2 | | |
| F1 | Fine | Moderate | 17:50 | 33.7 | S | 0.18 | 186 | 26.6 | 26.6 | 31.40 | 31.41 | 8.30 | 8.30 | 113.0 | 113.0 | 7.60 | 7.60 | 6.30 | 1.39 | 1.40 | 2.78 | 1.4 | 1.6 | 2.0 |
| | | | | | | 0.20 | 190 | 26.6 | | 31.41 | | 8.30 | | 112.9 | | 7.59 | | | 1.40 | | | 1.7 | | |
| | | | | | M | 0.21 | 222 | 24.0 | 24.0 | 34.45 | 34.45 | 8.15 | 8.15 | 72.3 | 72.3 | 5.00 | 5.00 | | 2.40 | 2.39 | | 2.2 | 2.1 | |
| | | | | | | 0.22 | 225 | 24.0 | | 34.45 | | 8.15 | | 72.3 | | 5.00 | | | 2.38 | | | 1.9 | | |
| | | | | | B | 0.45 | 256 | 23.4 | 23.4 | 34.69 | 34.69 | 8.17 | 8.17 | 78.1 | 78.1 | 5.44 | 5.44 | | 4.55 | 4.55 | | 2.6 | 2.3 | |
| | | | | | | 0.47 | 274 | 23.4 | | 34.69 | | 8.17 | | 78.1 | | 5.44 | | | 4.54 | | | 1.9 | | |
| IM3 | Fine | Moderate | 18:49 | 4.2 | S | 0.05 | 320 | 26.4 | 26.4 | 31.17 | 31.18 | 8.16 | 8.16 | 92.6 | 92.7 | 6.26 | 6.27 | 6.27 | 1.52 | 1.52 | 2.30 | 1.6 | 2.0 | 1.3 |
| | | | | | | 0.05 | 331 | 26.4 | | 31.18 | | 8.16 | | 92.7 | | 6.27 | | | 1.51 | | | 2.4 | | |
| | | | | | M | 0.00 | 0 | | - | | - | | - | | - | | - | | | - | | 0.0 | 0.0 | |
| | | | | | | 0.00 | 0 | | | | | | | | | | | | | | | 0.0 | | |
| | | | | | B | 0.11 | 212 | 26.0 | 26.0 | 32.06 | 32.06 | 8.23 | 8.23 | 102.5 | 102.6 | 6.95 | 6.95 | | 3.08 | 3.09 | | 2.2 | 1.8 | |
| | | | | | | 0.12 | 226 | 26.0 | | 32.05 | | 8.23 | | 102.6 | | 6.95 | | | 3.10 | | | 1.4 | | |
| G3 | Fine | Moderate | 18:41 | 23.8 | S | 0.41 | 228 | 26.1 | 26.1 | 31.08 | 31.08 | 8.06 | 8.06 | 65.4 | 65.4 | 4.44 | 4.45 | 4.57 | 1.83 | 1.83 | 1.98 | 2.0 | 1.7 | 1.5 |
| | | | | | | 0.44 | 233 | 26.1 | | 31.07 | | 8.06 | | 65.4 | | 4.45 | | | 1.83 | | | 1.4 | | |
| | | | | | M | 0.14 | 246 | 25.5 | 25.5 | 32.50 | 32.50 | 8.09 | 8.09 | 68.8 | 68.9 | 4.69 | 4.69 | | 1.68 | 1.69 | | 1.8 | 1.6 | |
| | | | | | | 0.35 | 247 | 25.5 | | 32.50 | | 8.09 | | 68.9 | | 4.69 | | | 1.69 | | | 1.4 | | |
| | | | | | B | 0.33 | 231 | 24.3 | 24.3 | 34.02 | 34.08 | 8.13 | 8.14 | 73.2 | 73.2 | 5.05 | 5.05 | | 2.37 | 2.44 | | 1.0 | 1.3 | |
| | | | | | | 0.36 | 232 | 24.2 | | 34.14 | | 8.14 | | 73.1 | | 5.05 | | | 2.50 | | | 1.6 | | |

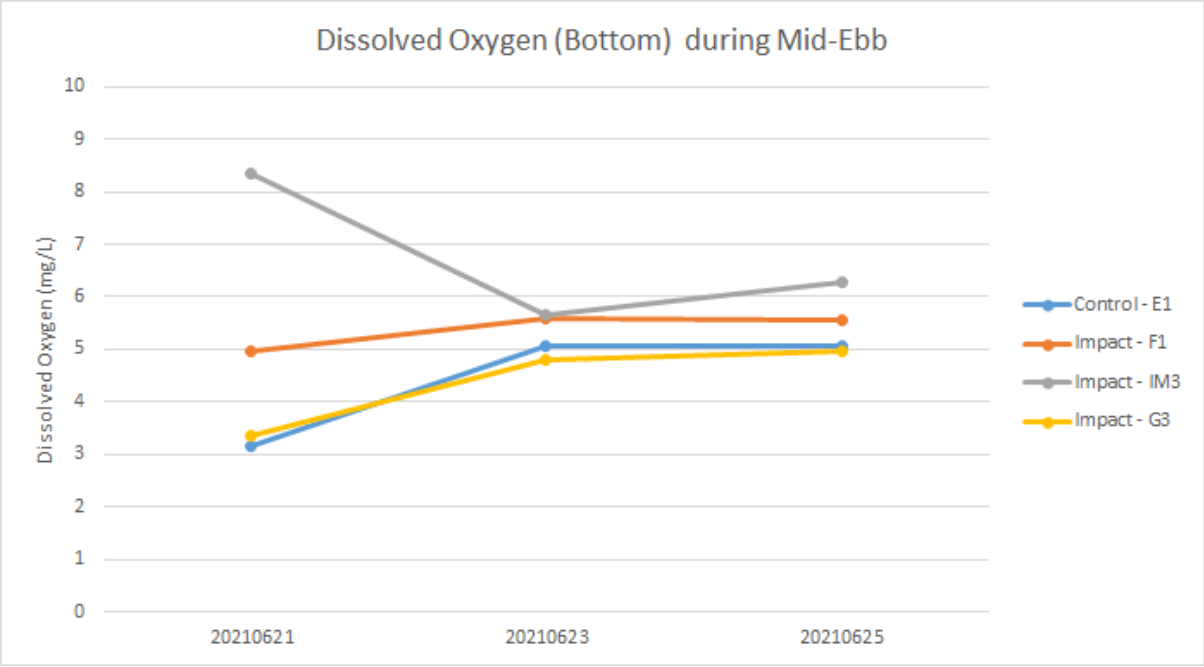
**Remark: * DA: Depth-Averaged**

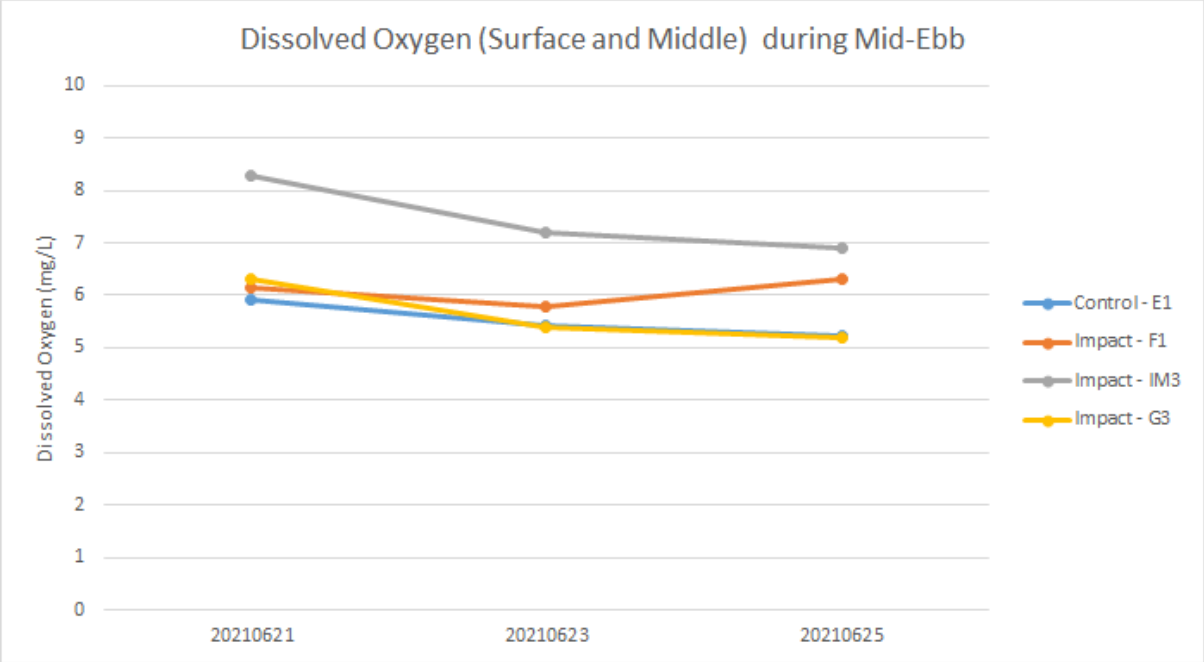
***** S: 1 m below the sea surface; M: mid-depth; S: 1 m above the seabed**

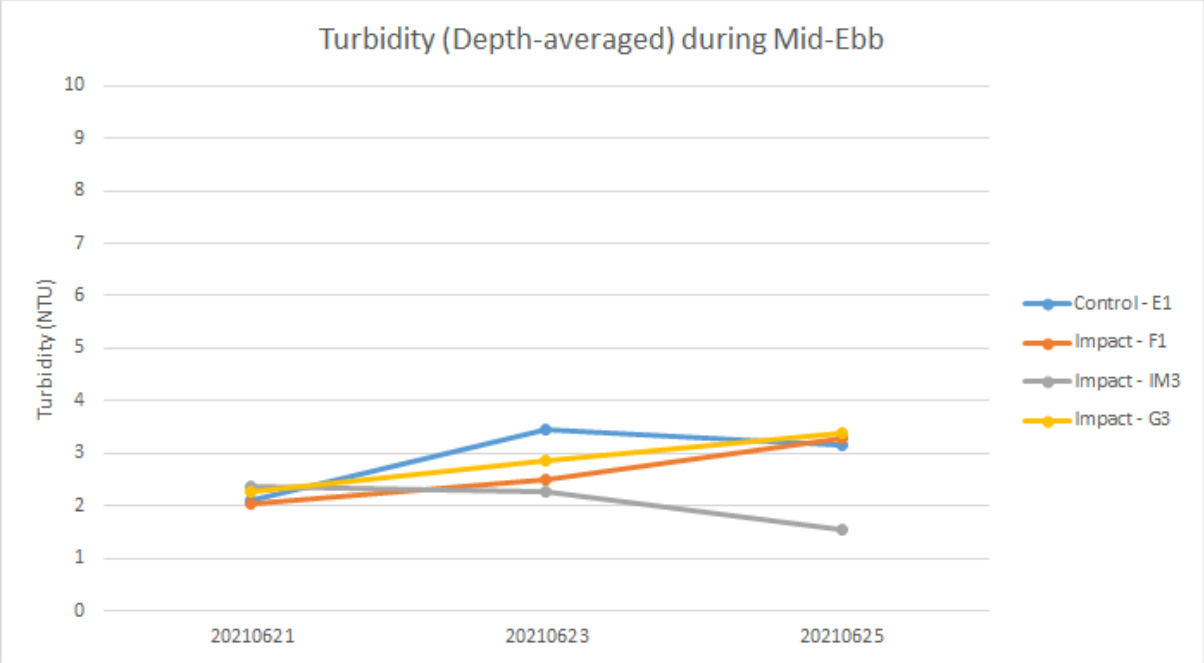
**Graphical presentation of the post-project monitoring result for Zone B**

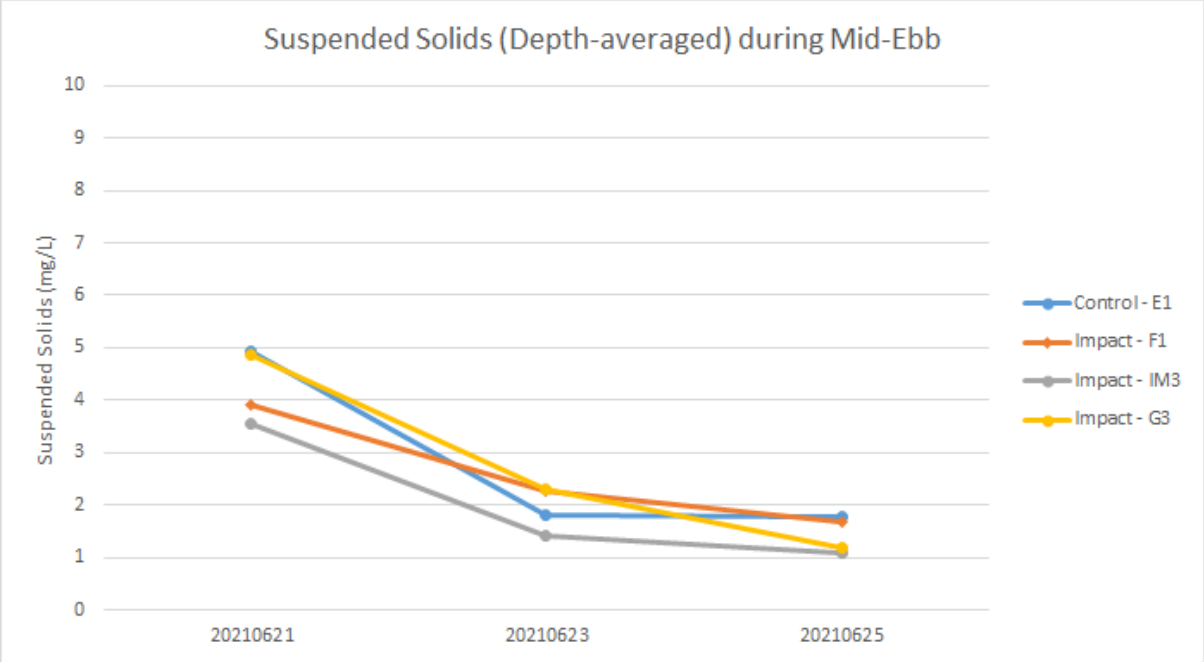
During Mid-Ebb



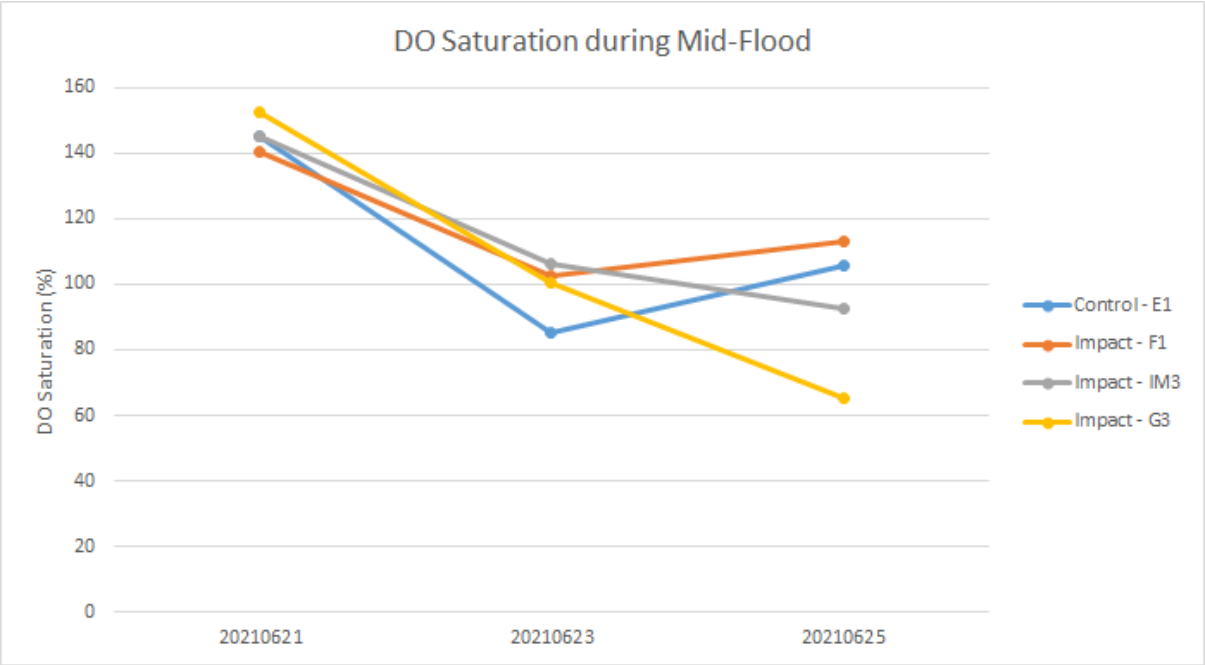



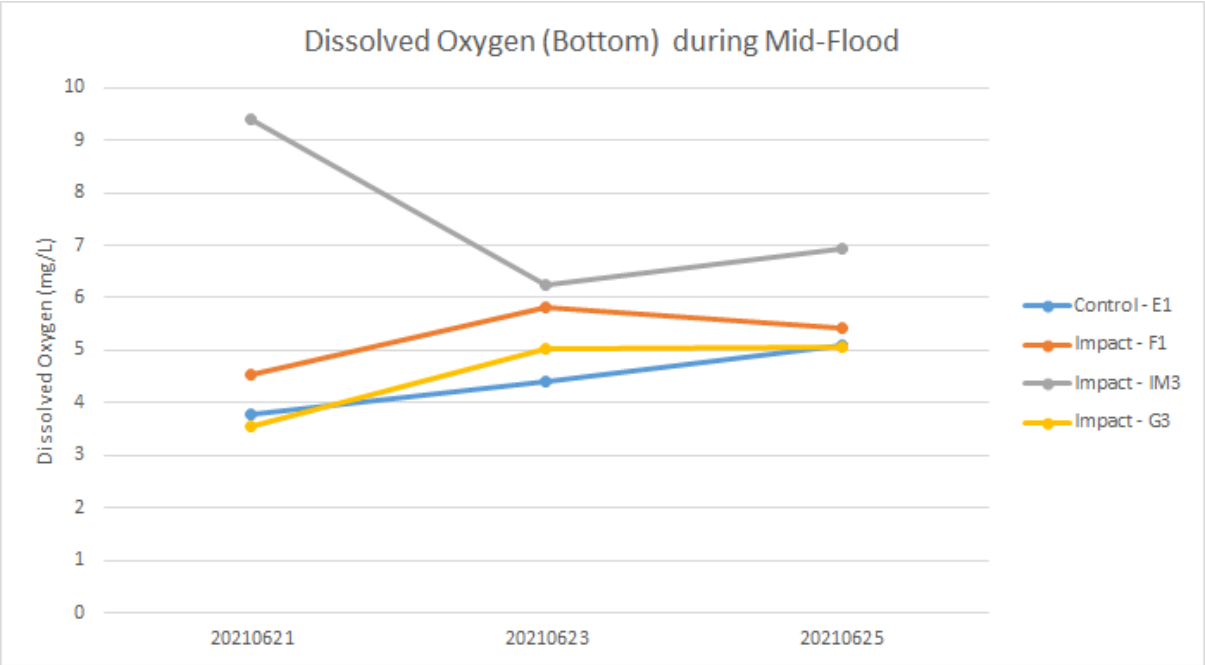

Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Dissolved Oxygen (mg/L)
10
9
8
7
6
5
4
3
2
1
0
20210621
20210623
20210625
Control - E1
Impact - F1
Impact - IM3
Impact - G3

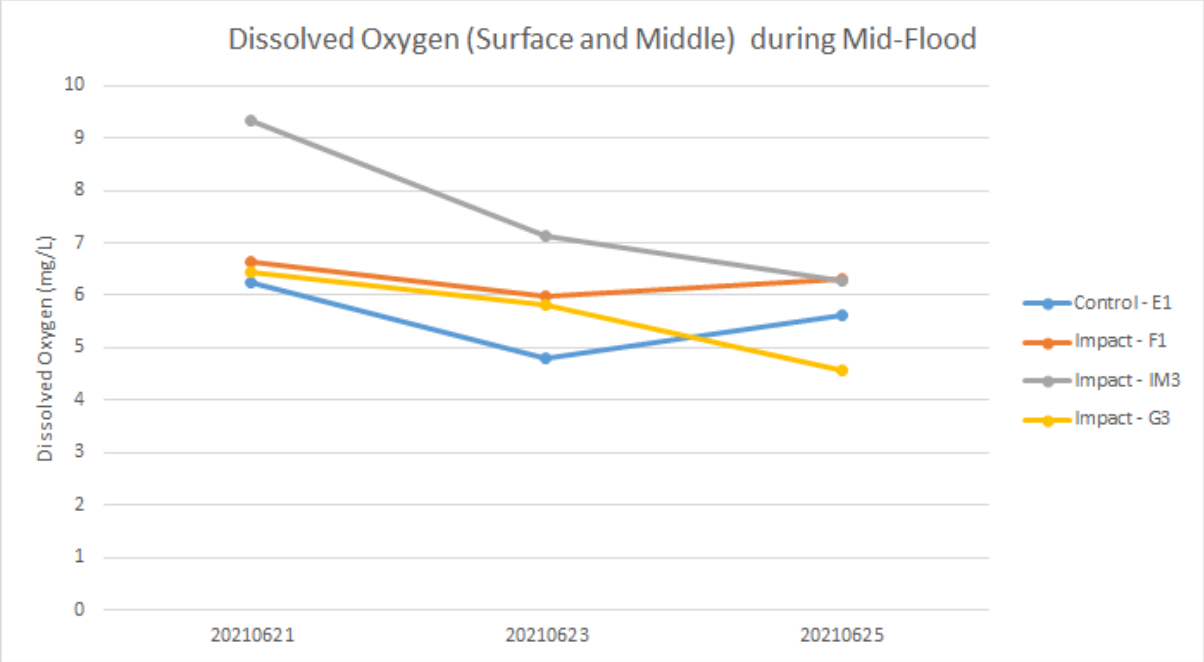

Turbidity (Depth-averaged) during Mid-Ebb
Turbidity (NTU)
10
9
8
7
6
5
4
3
2
1
0
20210621
20210623
20210625
Control - E1
Impact - F1
Impact - IM3
Impact - G3

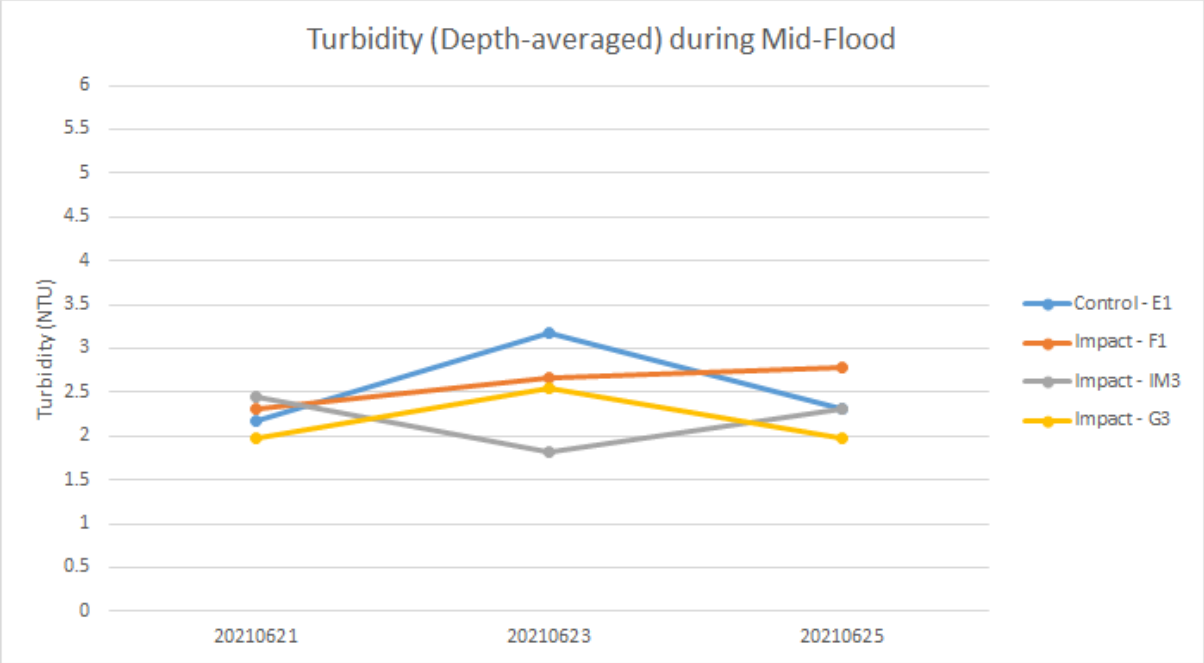

Suspended Solids (Depth-averaged) during Mid-Ebb
Suspended Solids (mg/L)
10
9
8
7
6
5
4
3
2
1
0
20210621
20210623
20210625
Control - E1
Impact - F1
Impact - IM3
Impact - G3

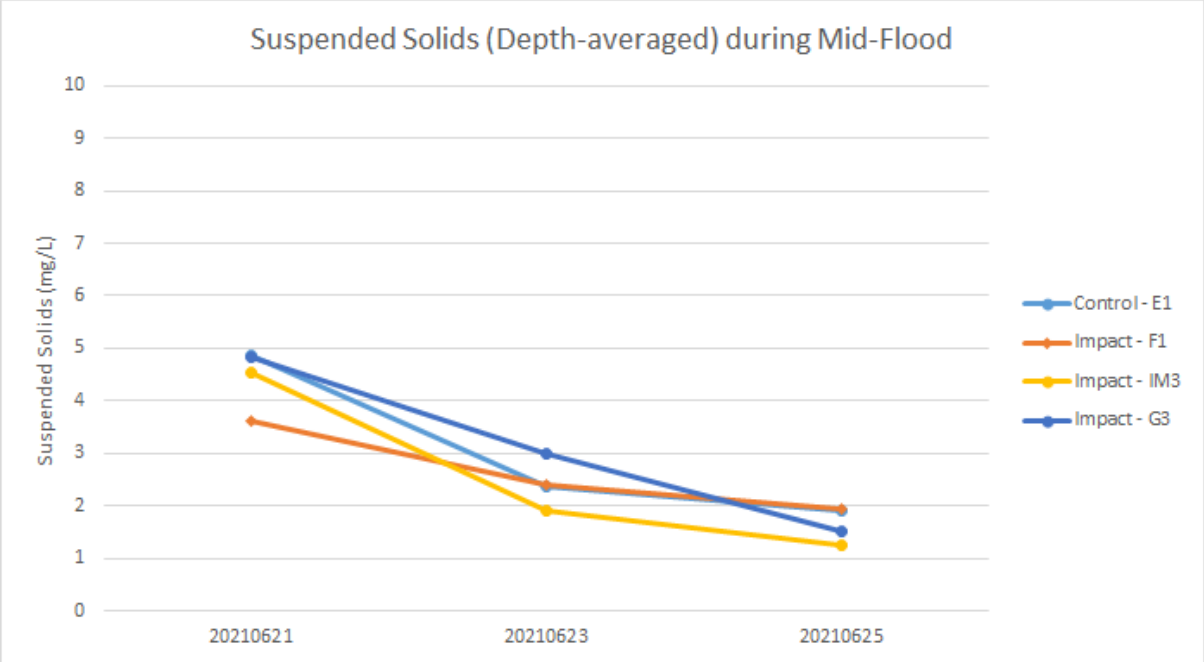
During Mid-Flood




Dissolved Oxygen (Surface and Middle) during Mid-Flood
Dissolved Oxygen (mg/L)
10
9
8
7
6
5
4
3
2
1
0
20210621
20210623
20210625
Control - E1
Impact - F1
Impact - IM3
Impact - G3


Turbidity (Depth-averaged) during Mid-Flood
Turbidity (NTU)
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
20210621
20210623
20210625
Control - E1
Impact - F1
Impact - IM3
Impact - G3


Suspended Solids (Depth-averaged) during Mid-Flood
Suspended Solids (mg/L)
10
9
8
7
6
5
4
3
2
1
0
20210621
20210623
20210625
Control - E1
Impact - F1
Impact - IM3
Impact - G3

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