



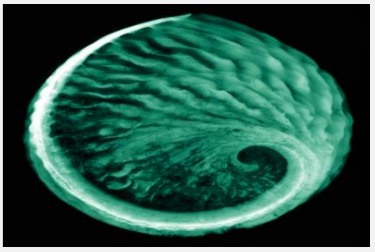

Hong Kong Offshore LNG Terminal Project

Final Environmental Monitoring and Audit (EM&A) Review Report

27 October 2023

Project No.: 0505354

The business of sustainability

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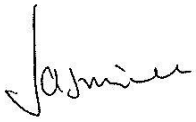
27 October 2023

Hong Kong Offshore LNG Terminal Project

Final Environmental Monitoring and Audit (EM&A) Review Report



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Hong Kong Offshore LNG Terminal
Environmental Certification Sheet
FEP-01/558/2018/A, FEP-02/558/2018/A and FEP-03/558/2018/B

Reference Document/Plan

Document/~~Plan~~ to be Certified/ Verified:	Final Environmental Monitoring and Audit (EM&A) Review Report
Date of Report:	27 October 2023
Date prepared by ET:	27 October 2023
Date received by IEC:	30 October 2023

Reference EP Requirement

EP Condition:	Condition No. 5.1 of FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B

The Permit Holder shall implement the EM&A programme in accordance with the procedures and requirements as set out in the Updated EM&A Manual.

ET Certification

I hereby certify that the above referenced document/~~plan~~ complies with the above referenced condition of FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B.

Mr Raymond Chow,
Environmental Team Leader: 

Date: 27 October 2023

IEC Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B.

Ms Lydia Chak,
Independent Environmental Checker: 

Date: 3 November 2023

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EXECUTIVE SUMMARY

To support the increased use of natural gas in Hong Kong from 2020 onwards, Castle Peak Power Company Limited (CAPCO) and The Hongkong Electric Co., Ltd. (HK Electric) have identified that the development of an offshore liquefied natural gas (LNG) receiving terminal in Hong Kong using Floating Storage and Regasification Unit (FSRU) technology ('the Project') presents a viable additional gas supply option that will provide energy security through access to competitive gas supplies from world markets. The Project will involve the construction and operation of an offshore LNG import facility to be located in the southern waters of Hong Kong, a double berth jetty, and subsea pipelines that connect to the gas receiving stations (GRS) at the Black Point Power Station (BPPS) and the Lamma Power Station (LPS). To demarcate the works between different parties, the following Further Environmental Permits (FEPs) were issued for the Project:

- the double berth jetty at LNG Terminal under the Hong Kong LNG Terminal Limited (HKLTL), joint venture between CAPCO and HK Electric (FEP-01/558/2018/A) – construction commenced on 27 November 2020;
- the subsea gas pipeline for the BPPS and the associated GRS in the BPPS under CAPCO (FEP-03/558/2018/B) – construction commenced on 23 September 2020; and
- the subsea gas pipeline for the LPS and the associated GRS in the LPS under HK Electric (FEP-02/558/2018/A) – construction commenced on 13 December 2020.

The construction of the Project was completed on 27 June 2023. This is the Final EM&A Review Report presenting the EM&A works carried out for the construction phase of the Project between 23 September 2020 and 27 June 2023 in accordance with the Updated EM&A Manual. A summary of monitoring and audit activities conducted for the construction phase is listed below:

Activities	Number of Sessions
For FEP-01/558/2018/A	
Marine Mammal Monitoring (vessel-based line transect survey)	36
Passive Acoustic Monitoring (C-POD deployment)	Completed for construction phase
Marine Mammal Exclusion Zone Monitoring	During percussive piling works for construction of the Jetty
Environmental Site Inspection	28
For FEP-02/558/2018/A	
Marine Water Quality Monitoring	54
Marine Water Quality Monitoring for Hydrotesting for the LPS Pipeline	10
Marine Mammal Exclusion Zone Monitoring	During dredging / jetting operation for construction of LPS Pipeline
Pilot Test on the Efficiency of Silt Curtain System – Cage-type Silt Curtain for Dredging Operation	1
Environmental Site Inspection	24
For FEP-03/558/2018/B	
Marine Water Quality Monitoring	112

Activities	Number of Sessions
Marine Water Quality Monitoring for Hydrotesting for the BPPS Pipeline	11
Marine Mammal Exclusion Zone Monitoring	During dredging / jetting operation for construction of BPPS Pipeline
Pilot Test on the Efficiency of Silt Curtain System – Cage-type Silt Curtain for Dredging Operation	1
Environmental Site Inspection	73
For FEP-02/558/2018/A and FEP-03/558/2018/B	
Pilot Test on the Efficiency of Silt Curtain System – Cage-type Silt Curtain for Jetting Operation	1
Pilot Test on the Efficiency of Silt Curtain System – Floating Silt Curtain for Jetting Operation	1

Environmental auditing works, including regular site inspections of construction works conducted by the ET, audit of implementation of Waste Management Plan, and review of the acceptability of operating speeds and marine travel routes of working vessels, including checking of compliance with the approval conditions given by the Director of Environmental Protection for the entry of working vessels within marine parks, in pursuant to Condition 3.1 of FEP-01/558/2018/A, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B, were conducted during the construction phase of the Project as appropriate. No non-compliance of environmental statutory requirements was identified.

Breaches of Action and Limit Levels

There were no Project-related Action and Limit Level exceedances for marine water quality monitoring as well as marine water quality monitoring for hydrotesting for the BPPS Pipeline and LPS Pipeline during the construction phase of the Project. There were no Project-related Action and Limit Level exceedances for the post-construction water quality monitoring of the Project.

There were no breaches of Action and Limit Levels for marine mammal monitoring during the construction phase of the Project.

Environmental Complaints, Notification of Summons and Successful Prosecution

There were three environmental complaints received during the construction phase of the Project, including:

- **Environmental Complaints #1 & #2 on the absence of silt curtain for post-trenching operation of the LPS Pipeline:** Upon investigation, no post-trenching operation was conducted for the LPS Pipeline in the past two weeks upon receipt of complaints (i.e. between 6 and 20 January 2022). Only survey works for confirming seabed profile in the vicinity of the LPS Pipeline were conducted, which did not result in any unacceptable environmental impacts to the surrounding and the works were in compliance with the environmental requirements under FEP-02/558/2018/A and the approved EIA report (Register No.: AEIAR-218/2018). The two complaints on silt curtain not deployed during post-trenching operation are thus considered invalid.
- **Environmental Complaint #3 on the alleged dumping of waste into sea between Shek Kwu Chau and Tai A Chau:** Upon investigation, no construction & demolition (C&D) waste was generated from the Project in the past two weeks upon receipt of complaint (i.e. between 7 and

21 September 2022). There is no evidence showing any unacceptable waste management practice for the Project. Environmental protection / mitigation measures were observed to be implemented properly in accordance with the Implementation Schedule as well as the environmental requirements under the Further Environmental Permits and the approved EIA report (Register No.: AEIAR-218/2018). The complaint is thus considered invalid.

There were no notification of summons and successful prosecutions recorded during the construction phase of the Project.

Reporting Changes

There were no reporting changes during the construction phase of the Project.

Comments, Recommendations and Conclusions for the Construction Phase

The recommended environmental mitigation measures for the Project were effectively implemented and the EM&A programme undertaken by the ET has effectively monitored the construction activities as well as ensured proper implementation of mitigation measures during the construction phase. The monitoring and audit activities conducted during the construction phase of the Project have been reviewed and are considered effective. Based on the EM&A findings for the construction phase, the environmental performance for the construction of the Project is generally in line with the EIA predictions and considered acceptable.

The commencement of operation of the Project is on 3 July 2023. The potential environmental impacts during operation are mainly associated with seawater and effluent discharges associated with the LNG Terminal operation. Operation phase water quality monitoring exercise will be carried out for one year at a frequency of once per week. The monitoring results will be presented in the water quality monitoring reports for the first year of operation of the LNG Terminal to be prepared every quarter and at the end of the first year of operation of the LNG Terminal.

1. INTRODUCTION

1.1 Background

To support the increased use of natural gas in Hong Kong from 2020 onwards, Castle Peak Power Company Limited (CAPCO) and The Hongkong Electric Co., Ltd. (HK Electric) have identified that the development of an offshore liquefied natural gas (LNG) receiving terminal in Hong Kong using Floating Storage and Regasification Unit (FSRU) technology ('the Project') presents a viable additional gas supply option that will provide energy security through access to competitive gas supplies from world markets. The Project will involve the construction and operation of an offshore LNG import facility to be located in the southern waters of Hong Kong, a double berth jetty, and subsea pipelines that connect to the gas receiving stations (GRS) at the Black Point Power Station (BPPS) and the Lamma Power Station (LPS).

The Environmental Impact Assessment (EIA) Report for the Project was submitted to the Environmental Protection Department (EPD) of the HKSAR Government in May 2018. The EIA Report (EIAO Register No. AEIAR-218/2018) was approved by EPD and the associated Environmental Permit (EP) (EP-558/2018) was issued in October 2018.

An application for Further Environmental Permits (FEPs) were made on 24 December 2019 to demarcate the works between the different parties. The following FEPs were issued on 17 January 2020 and the EP under EP-558/2018 was surrendered on 5 March 2020.

- the double berth jetty at LNG Terminal under the Hong Kong LNG Terminal Limited (HKLTL), joint venture between CAPCO and HK Electric (FEP-01/558/2018/A) [(1)] – construction commenced on 27 November 2020;
- the subsea gas pipeline for the BPPS and the associated GRS in the BPPS under CAPCO (FEP-03/558/2018/B) [(2)] – construction commenced on 23 September 2020; and
- the subsea gas pipeline for the LPS and the associated GRS in the LPS under HK Electric (FEP-02/558/2018/A) [(3)] – construction commenced on 13 December 2020.

The location of these components is shown in ***Figures 1.1***, ***1.2*** and ***1.3***.

The construction of the Project was completed on 27 June 2023.

1.2 Scope of the EM&A Report

This is the Final EM&A Review Report for the Project which summarises the key findings of the EM&A programme for the construction phase of the Project between 23 September 2020 and 27 June 2023 in accordance with the Updated EM&A Manual and the requirements of the Further Environmental Permits (FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B).

1.3 Organisation Structure

The organisation structure of the Project is shown in ***Annex A***. The key personnel and contact details are summarised in ***Table 1.1*** below.

(1) Application for variation of an environmental permit for FEP-01/558/2018 was undertaken and the latest FEP (FEP-01/558/2018/A) was issued on 6 November 2020.

(2) Application for variation of an environmental permit for FEP-03/558/2018/A was undertaken and the latest FEP (FEP-03/558/2018/B) was issued on 25 August 2021.

(3) Application for variation of an environmental permit for FEP-02/558/2018 was undertaken and the latest FEP (FEP-02/558/2018/A) was issued on 22 December 2020.

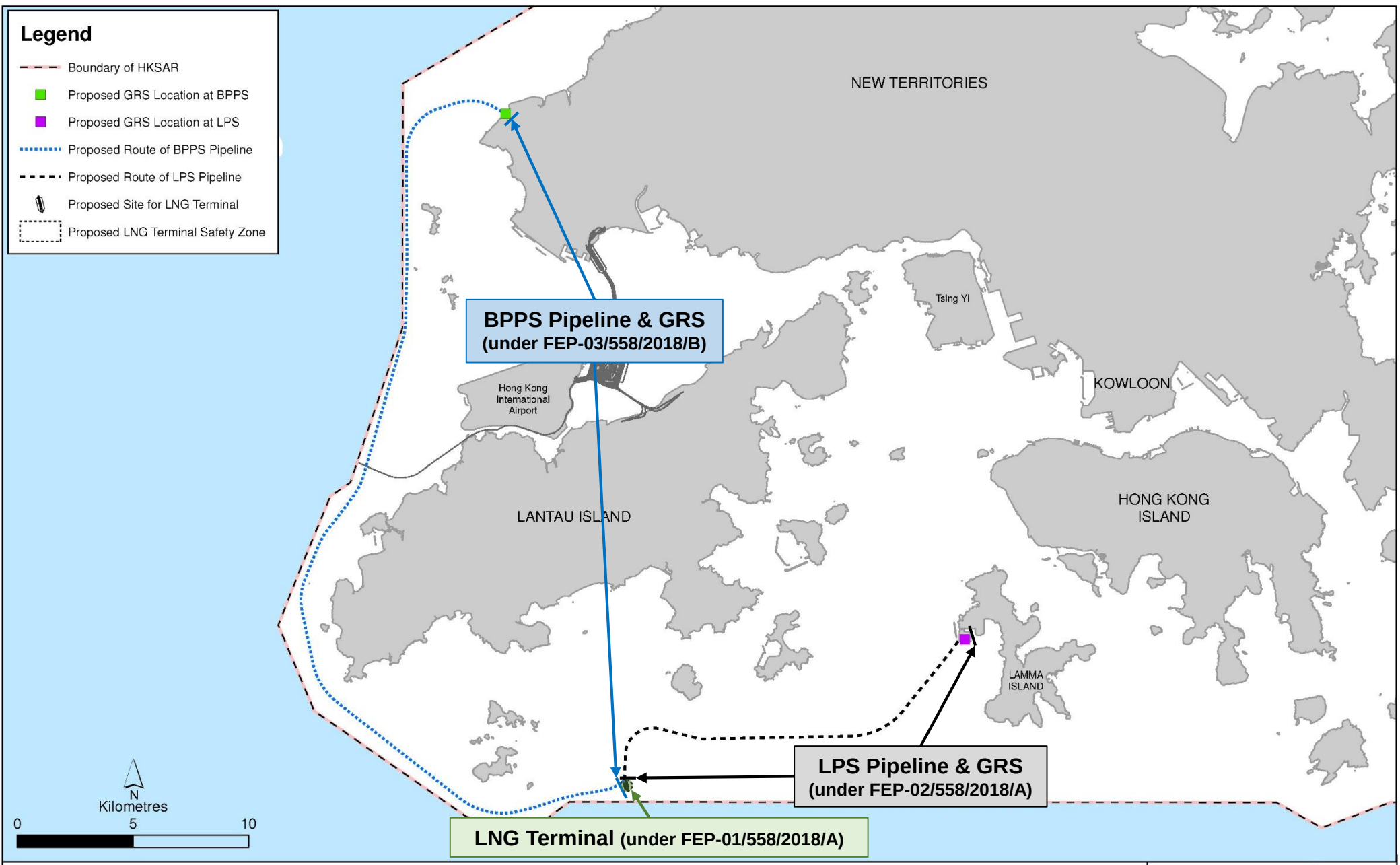


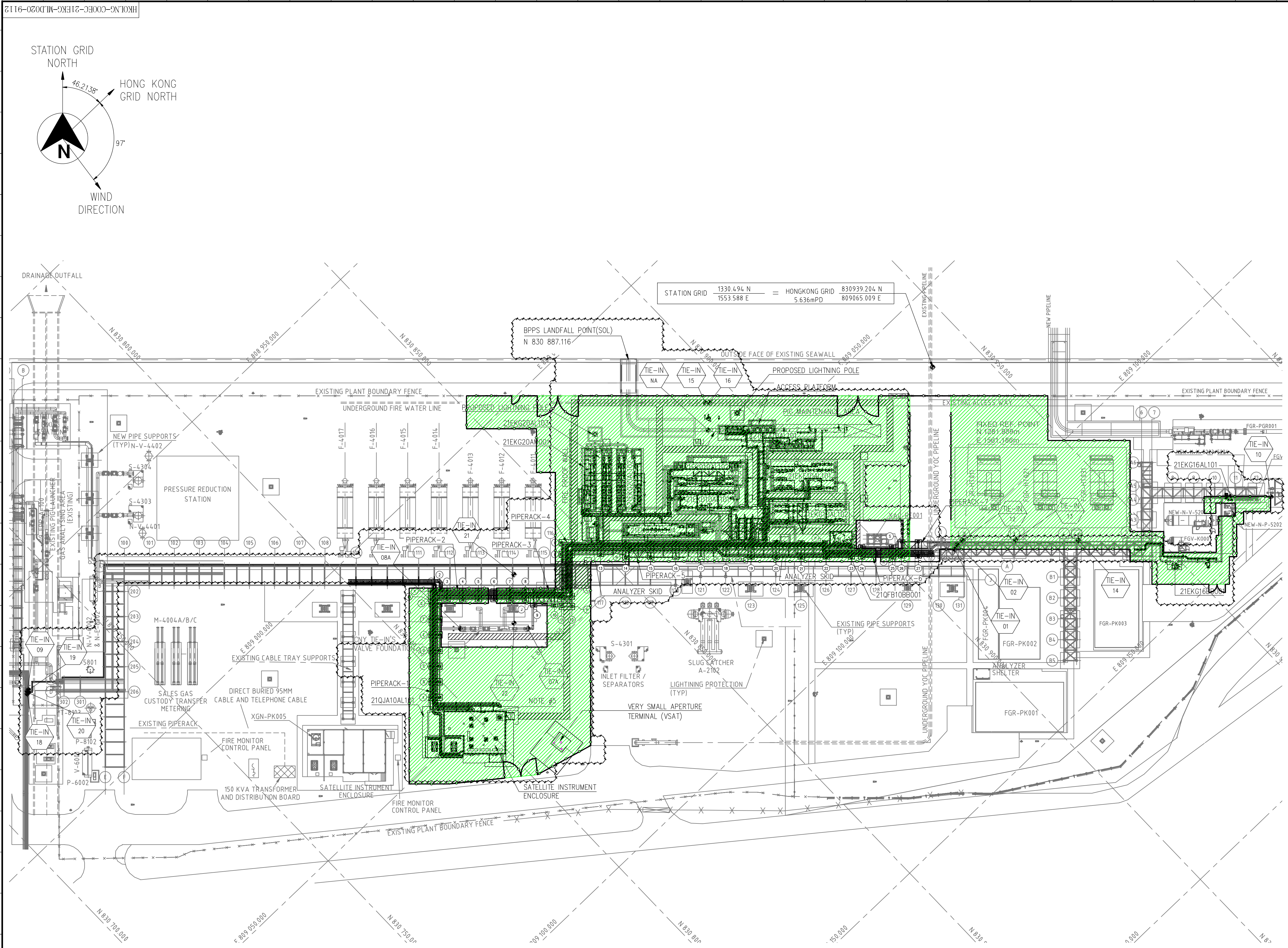
Figure 1.1

Indicative Location of Key Project Components

File: T:\GIS\CONTRACT\0359722\Mxd\EIA\0359722_Project_Site_with_HZMB.mxd
Date: August 2021

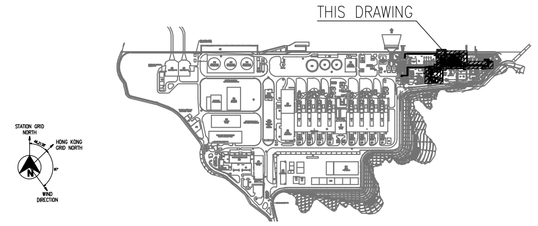
Environmental Resources Management

ERM



HKOLNG-COOEC-21EKG-MLD020-9112
STATION GRID NORTH
HONG KONG GRID NORTH
46.2135°
97°
N
WIND DIRECTION
DRAINAGE OUTFALL
STATION GRID 1330.494 N 1553.588 E = HONGKONG GRID 830939.204 N 809065.009 E 5.636mPD
BPPS LANDFALL POINT(SOL) N 830 887.116
OUTSIDE FACE OF EXISTING SEAWALL
PROPOSED LIGHTNING POLE
ACCESS PLATFORM
EXISTING PLANT BOUNDARY FENCE
UNDERGROUND FIRE WATER LINE
PIG MAINTENANCE AREA
EXISTING ACCESS WAY
FIXED REF. POINT N 1281.889m E 1561.186m
NEW PIPELINE
EXISTING PIPELINE
UNDERGROUND YOC PIPELINE
NEW PIPE SUPPORTS (TYP)
PRESSURE REDUCTION STATION
PIPERACK-2
PIPERACK-3
PIPERACK-4
PIPERACK-5
PIPERACK-6
PIPERACK-7
PIPERACK-1
ANALYZER SKID
21QFB10BB001
EXISTING PIPE SUPPORTS (TYP)
M-4004A/B/C
SALES GAS CUSTODY TRANSFER METERING
DIRECT BURIED 95MM CABLE AND TELEPHONE CABLE
EXISTING CABLE TRAY SUPPORTS
EXISTING PIPERACK
XGN-PK005
FIRE MONITOR CONTROL PANEL
150 KVA TRANSFORMER AND DISTRIBUTION BOARD
SATELLITE INSTRUMENT ENCLOSURE
FIRE MONITOR CONTROL PANEL
EXISTING PLANT BOUNDARY FENCE
21QJA10AL101
NOTE #5
S-4301
INLET FILTER / SEPARATORS
SLUG CATCHER A-2102
LIGHTNING PROTECTION (TYP)
VERY SMALL APERTURE TERMINAL (VSAT)
FGR-PK002
FGR-PK003
FGR-PK001
ANALYZER SHELTER
21EKG16AL101
21EKG20AN001
NEW-N-V-5201
NEW-N-P-5202
FGR-PGR001

KEY PLAN



GENERAL NOTES

1. ALL DIMENSIONS ARE IN mm, ELEVATIONS & COORDINATES ARE IN m.
2. NOMINAL GRADE (PIPING DATUM) 0.000m = NOMINAL GRADE (HONG KONG DATUM) 5.700m.
3. RELATIONSHIP OF HONG KONG GRID TO STATION GRID.
   H.K. GRID 808 950.493 E / 828 896.966 N = STATION GRID 0.000 E / 0.000 N
4. PIG RECEIVER DESIGNED FOR INTELLIGENT PIGGING.
5. EXISTING HOSEREEL CABINET AT NEW SIE BUILDING SHALL BE RELOCATED.

LEGEND

- ESCAPE /ACCESS — CLEAR WIDTH OF NOT LESS THAN 1.525m AND CLEAR HEIGHT OF 2.3m.
- NEW BPPS GRS SCOPE OF WORK
- SITE BOUNDARY AT THE BPPS GRS

10 0 10 20 30m

REFERENCE DOCUMENTS

DWG. NO.	DRAWING TITLE
HKOLNG-COOEC-21EKG-MPD010-9101	HKOLNG GRS - EQUIPMENT LIST

REVISION

No.	DATE	DESCRIPTION	BY	CH'K.	APP'D	CLP
C	03JUN2020	ISSUED FOR REVIEW	AKR	ASD	MF	
B	17APR2020	INTERNALLY APPROVED	AKR	ASD	MF	
A	21FEB2020	DISCIPLINE INTERNAL CHECK	AKR	ASD	MF	

CLIENT: CAPCO · Offshore Oil Engineering Co., Ltd. · RMA FIVENTURES

SIGNATURE		DATE
DRAWN	SGB	20AUG2020
DESIGNED	AKR	20AUG2020
CHECKED	ASD	20AUG2020
REVIEWED	TWC	20AUG2020
EXAMINED	TWC	20AUG2020
APPROVED	MF	20AUG2020

PROJECT: HONG KONG OFFSHORE LNG TERMINAL PROJECT PACKAGE B

DRAWING TITLE: HKOLNG GRS - OVERALL PLOT PLAN GRS

DWG No. HKOLNG-COOEC-21EKG-MLD020-9112

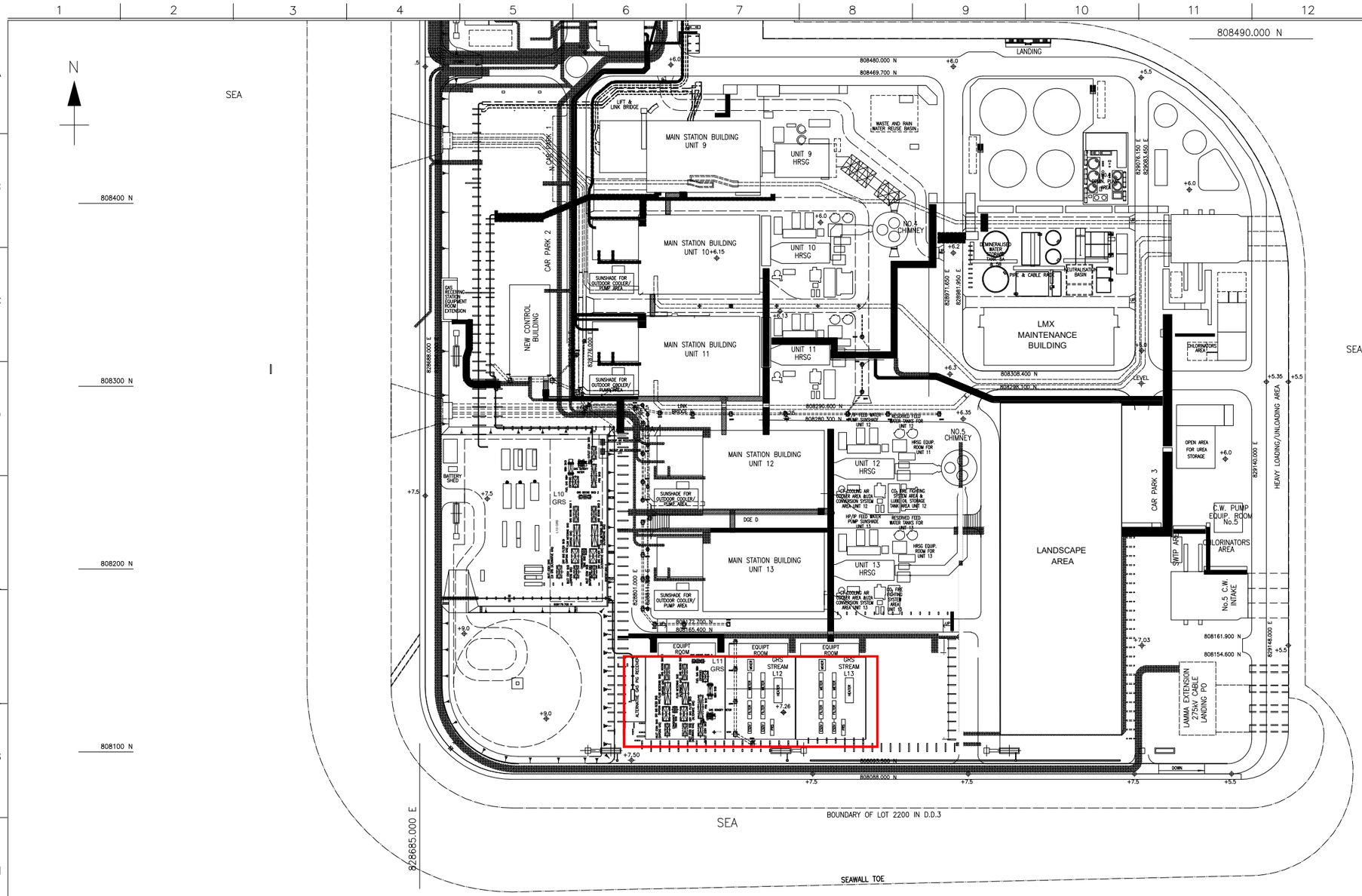
JOB No. 20ZB-DD02

CERTIF. No. A112002816

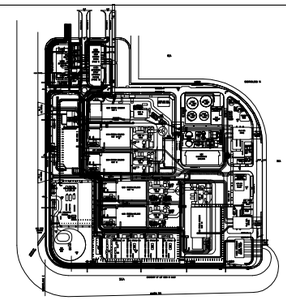
SCALE (A3) 1 : 1000

REV. C

Figure 1.2



KEYPLAN



NOTES

1. ALL DIMENSIONS & CORRDINATES ARE IN MM.

LEGEND

LOCATION AND WORKS AREA OF GRS

DESCRIPTION	DWG NO.	REV	DATE	BY	CHK	APP	DESCRIPTION
LEGEND	REFERENCE DRAWINGS	REVISIONS					

CLIENT:

The Hongkong Electric Co., Ltd.

PROJECT:

HONG KONG OFFSHORE LNG TERMINAL - WORKS ASSOCIATED WITH THE SUBSEA GAS PIPELINE FOR LAMMA POWER STATION (LPS) AND THE ASSOCIATED GAS RECEIVING STATION (GRS) IN LPS (ENVIRONMENTAL PERMIT NO.: FEP-02/558/2018)

TITLE:

LOCATION AND WORKS AREA OF GRS AT LAMMA POWER STATION

SCALE : 1:1000

CONTRACTOR DRAWING NO.

Figure 1.3

REV. 0

DATE. 16/6/2020

PAGE 1 OF 1

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone
CAPCO / HKLTL (For FEP-01/558/2018/A and FEP-03/558/2018/B)	Senior Manager - Environment	Karen Lui	2678 8282
HK Electric / HKLTL (For FEP-01/558/2018/A and FEP-02/558/2018/A)	Head of Mechanical Engineering, Projects Division	Norman Chan	3143 3819
Environmental Team (ET) (ERM-Hong Kong, Limited)	ET Leader	Raymond Chow	2271 3281
Independent Environmental Checker (IEC) (Mott MacDonald Hong Kong Limited)	IEC	Lydia Chak	2585 8473
Contractor (CNOOC Offshore Oil Engineering Co. Ltd.)	Environmental Manager	H Y Tang	6111 5789

1.4 Summary of Construction Activities

The programme of the construction is shown in ***Annex B***.

The details of the major construction activities undertaken are listed in ***Table 1.2*** below:

Table 1.2 Major Construction Activities Undertaken

FEP	Land-based Works	Marine-based Works
FEP-01/558/2018/A	▪ Topside installation works ▪ Piping installation works ▪ System commissioning	▪ Jacket installation ▪ Pile installation ▪ Topsides installation ▪ Piping installation
FEP-02/558/2018/A	▪ Preparation of intermediate hydrotesting for pipeline ▪ System commissioning	▪ Pre-trenching ▪ Dredging works ▪ De-burial (pre-trenching) of pre-installed pipeline by Mass Flow Excavator (1) ▪ Pipe-laying works ▪ Intermediate hydrotesting for pipeline ▪ Post-trenching ▪ Rock armour placement ▪ Final hydrotest
FEP-03/558/2018/B	▪ Preparation works at the new GRS (including set-up of site offices, erection of hoarding and mobilisation of wastewater treatment facilities)	▪ Pipe-laying works ▪ Pre-trenching ▪ Sheet pile installation ▪ Shore-pull operations

FEP	Land-based Works	Marine-based Works
	▪ Plate Load Test – Pipe Rack ▪ Cable pulling ▪ Construction of reinforced concrete foundation ▪ Underground drainage works ▪ Drainage installation ▪ Seawall construction ▪ Backfill and permanent paving works ▪ Excavation, drainage and backfilling works ▪ Pipe rack – erection and assembly ▪ Building superstructure works ▪ Piping installation works ▪ Box culvert works ▪ Instrumentation and control installation works ▪ Electrical and telecommunication installation works ▪ System commissioning	▪ Post-trenching ▪ Rock armour placement ▪ Removal of cofferdam ▪ Final hydrotest

Remark: (1) Mass flow excavator is a variance of jetting machine.

1.5 Summary of EM&A Programme Requirements

The status of EM&A Programme for all environmental aspects required under the Updated EM&A Manual are presented in ***Table 1.3***. The requirements of relevant environmental monitoring, including monitoring parameters, Action and Limit Levels, Event and Action Plan(s), environmental mitigation measures, etc. are presented in ***Section 2***.

Table 1.3 Summary of Status for the EM&A Programme under the Updated EM&A Manual

Aspects	Relevant FEP(s)	Status
Water Quality		
Baseline Monitoring	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	▪ Completed
Efficiency of Silt Curtain System	FEP-02/558/2018/A FEP-03/558/2018/B	▪ Completed for cage-type silt curtain for dredging operation (under FEP-02/558/2018/A and FEP-03/558/2018/B) ▪ Completed for cage-type silt curtain for jetting operation (under FEP-02/558/2018/A and FEP-03/558/2018/B) ▪ Completed for floating silt curtain for jetting operation (under FEP-02/558/2018/A and FEP-03/558/2018/B)
Construction Phase Monitoring	FEP-02/558/2018/A FEP-03/558/2018/B	▪ Completed for FEP-02/558/2018/A and FEP-03/558/2018/B
Post-Construction Monitoring	FEP-02/558/2018/A FEP-03/558/2018/B	▪ Completed for FEP-02/558/2018/A and FEP-03/558/2018/B

Aspects	Relevant FEP(s)	Status
Monitoring for Hydrotesting for the Subsea Gas Pipelines	FEP-02/558/2018/A FEP-03/558/2018/B	■ Completed for FEP-02/558/2018/A and FEP-03/558/2018/B
First-year of LNG Terminal Operation	FEP-01/558/2018/A	■ To be implemented during LNG Terminal operation
Maintenance Dredging	FEP-01/558/2018/A	■ To be implemented during maintenance dredging
Waste Management		
Audit of Waste Management Practice	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	■ On-going
Ecology		
Baseline Monitoring (Vessel-based Line Transect Survey and Passive Acoustic Monitoring)	FEP-01/558/2018/A	■ Completed
Construction Phase Monitoring (Vessel-based Line Transect Survey and Passive Acoustic Monitoring)	FEP-01/558/2018/A	■ Completed
Post-Construction Monitoring (Vessel-based Line Transect Survey and Passive Acoustic Monitoring)	FEP-01/558/2018/A	■ On-going
Marine Mammal Exclusion Zone Monitoring	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	■ Completed for FEP-01/558/2018/A (marine mammal exclusion zone with 500m radius) and FEP-02/558/2018/A and FEP-03/558/2018/B (marine mammal exclusion zone with 250m radius)
Environmental Site Inspection		
Regular Site Inspection	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	■ Completed
Records of Operating Speeds and Marine Travel Routes for Working Vessels	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	■ Completed
Environmental Log Book	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	■ On-going

1.6 Status of Other Statutory Environmental Requirements

The environmental licenses and permits, including further environmental permits, registration as chemical waste producer, construction noise permits, wastewater discharge license, marine dumping permits, etc., which were valid during the construction phase of the Project. No non-compliance with environmental statutory requirements, including FEP conditions (status of submission) under the EIA Ordinance, was identified. The status of statutory environmental requirements is presented in ***Annex D***.

The environmental mitigation implementation schedule (EMIS) is presented in ***Annex C***.

2. SUMMARY OF EM&A RESULTS

The EM&A programme for the Project required environmental monitoring for marine water quality and marine mammals as well as environmental site inspections for air quality, construction noise, water quality, waste management, marine ecology, landscape and visual, and hazard to life impacts. As presented in ***Section 1.5***, environmental site inspections and audit on waste management practice, marine water quality monitoring, including pilot tests on the efficiency of silt curtain system, marine mammal monitoring (i.e. vessel-based line transect survey and passive acoustic monitoring) and marine mammal exclusion zone monitoring were conducted during the construction phase, and the findings are summarised below.

2.1 Environmental Site Inspection

Regular environmental site inspections were carried out with the Contractor and Project Proponents to confirm the implementation of appropriate environmental protection and pollution control mitigation measures for air quality, construction noise, water quality, waste management, marine ecology, landscape and visual, and hazard to life impacts under the Project. During the construction phase, 125 environmental site inspections were carried out, of which 28 sessions were for FEP-01/558/2018/A, 24 sessions were for FEP-02/558/2018/A and 73 sessions were for FEP-03/558/2018/B. The Independent Environmental Checker (IEC) attended 75 environmental site inspections as the IEC audits. Aspects for the key observations recorded during site inspections are summarised in ***Table 2.1***. Details of observations recorded can be referred to *the associated Monthly EM&A Reports*. The environmental mitigation implementation schedule (EMIS) is presented in ***Annex C***.

Table 2.1 Summary of Aspects for Key Observations Recorded during Site Inspections

Aspect	Cumulative Number of Observations
FEP-01/558/2018/A	
Air quality	4
Water quality	0
Waste management	0
Ecology	0
Visual	0
Hazard to life	0
Others	0
Total	**4**
FEP-02/558/2018/A	
Air quality	3
Water quality	0
Waste management	1
Ecology	0
Visual	0
Hazard to life	0
Others	0
Total	**4**

Aspect	Cumulative Number of Observations
FEP-03/558/2018/B	
Air quality	19
Water quality	8
Waste management	13
Ecology	0
Visual	0
Hazard to life	0
Others	3
Total	**43**

2.2 Waste Management Status

Waste management audits were performed with reference to the Waste Management Checklists for the corresponding Waste Management Plans detailed in *Annex E of the associated Monthly EM&A Reports* during the regular environmental site inspections. No non-compliance for Contractor's waste management practices was identified during the audits.

The quantities of different types of waste and marine sediment generated for the three FEPs are summarised in ***Tables 2.2***, ***2.3*** and ***2.4*** with reference to the waste flow tables prepared by the Contractor. General refuse was generated under the three FEPs. Inert C&D materials (public fill) were generated under FEP-03/558/2018/B and disposed as public fill properly. Detailed waste flow tables can be referred to *Annex F of the associated Monthly EM&A Reports*.

Table 2.2 Quantities of Waste Generated for FEP-01/558/2018/A

Inert C&D Materials Generated (in '000kg)

Month/Year	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill
Oct 2020 - Sep 2021	0	0	0	0	0	0
Oct 2021 - Sep 2022	0	0	0	0	0	0
Oct 2022 – Jun 2023	0	0	0	0	0	0
Total	0	0	0	0	0	0

C&D Wastes Generated

Month/Year	Metals (in '000kg^3)	Paper / Cardboard Packaging (in '000kg^3)	Plastics (in '000kg^3)	Chemical Waste		Other (e.g. general refuse) (in '000kg)
				(in '000kg^3)	(in '000L)	
Oct 2020 - Sep 2021	0	0	0	0	0	39.080

Oct 2021 - Sep 2022	0	0	0	0	0	203.63
Oct 2022 – Jun 2023	0	0	0	0	0	195.59
Total	0	0	0	0	0	438.30

Note:
(1) Commencement date of construction for FEP-01/558/2018/A was 27 November 2020.

Table 2.3 Quantities of Waste and Marine Sediment Generated for FEP-02/558/2018/A

Inert C&D Materials Generated (in '000kg)

Month/Year	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill
Oct 2020 - Sep 2021	0	0	0	0	0	0
Oct 2021 - Sep 2022	0	0	0	0	0	0
Oct 2022 – Jun 2023	0	0	0	0	0	0
Total	0	0	0	0	0	0

C&D Wastes Generated

Month/Year	Metals (in '000kg^3)	Paper / Cardboard Packaging (in '000kg^3)	Plastics (in '000kg^3)	Chemical Waste		Other (e.g. general refuse) (in '000kg)
				(in '000kg^3)	(in '000L)	
Oct 2020 - Sep 2021	0	0	0	0	0	85.04
Oct 2021 - Sep 2022	0	0	0	0	0	22.23
Oct 2022 – Jun 2023	0	0	0	0	0	0
Total	0	0	0	0	0	107.27

Marine Sediment Generated (in '000m^3)

Month/Year	Total Quantity of Type L Generated	Total Quantity of Type M Generated	Reused in the Contract	Reused in other Projects	Open Sea Disposal
Oct 2020 -Sep 2021	4.388	0	0	0	4.388

Oct 2021 -Sep 2022	0	0	0	0	0
Oct 2022 – Jun 2023	0	0	0	0	0
Total	4.388	0	0	0	4.388

Note:
(1) Commencement date of construction for FEP-02/558/2018/A was 13 December 2020.

Table 2.4 Quantities of Waste and Marine Sediment Generated for FEP-03/558/2018/B

Inert C&D Materials Generated (in '000kg)

Month/Year	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill
Sep 2020 (1) - Sep 2021	10,613.30	0	0	0	10,613.30	0
Oct 2021 - Sep 2022	2,442.25	0	0	0	2,442.25	0
Oct 2022 – Jun 2023	0	0	0	0	0	0
Total	13,055.55	0	0	0	13,055.55	0

C&D Wastes Generated

Month/Year	Metals (in '000kg^3)	Paper / Cardboard Packaging (in '000kg^3)	Plastics (in '000kg^3)	Chemical Waste		Other (e.g. general refuse) (in '000kg)
				(in '000kg^3)	(in '000L)	
Sep 2020 (1) - Sep 2021	0	0	0	0	0	241.27
Oct 2021 - Sep 2022	0	0	0	0	0	365.38
Oct 2022 – Jun 2023	0	0	0	0	0	7.48
Total	0	0	0	0	0	614.13

Marine Sediment Generated (in '000m^3)

Month/Year	Total Quantity of Type L Generated	Total Quantity of Type M Generated	Reused in the Contract	Reused in other Projects	Open Sea Disposal
Sep 2020 (1) - Sep 2021	87.042	59.610	0	1.602	145.050

Oct 2021 -Sep 2022	0	0	0	0	0
Oct 2022 – Jun 2023	0	0	0	0	0
Total	87.042	59.610	0	1.602	145.050

Note:
(1) Commencement date of construction for FEP-03/558/2018/B was 23 September 2020.

2.3 Marine Water Quality Monitoring

2.3.1 Monitoring Requirements

In accordance with the Updated EM&A Manual, marine water quality monitoring shall be undertaken at the monitoring stations as shown in ***Figure 2.1*** and ***Table 2.5*** three times a week at both mid-ebb and mid-flood tides during periods when there are dredging / jetting operations during construction phase of BPPS Pipeline or LPS Pipeline. The interval between two sets of monitoring would not be less than 36 hours. Two replicates of *in-situ* measurements and samples were collected at each monitored water depth of each monitoring stations. Levels of dissolved oxygen (DO), pH value, salinity, temperature and turbidity were measured *in-situ* whereas the level of suspended solids (SS) were determined by a HOKLAS accredited laboratory. The detailed methodology is presented in the Updated EM&A Manual.

Table 2.5 Location of Marine Water Quality Monitoring Stations

Station	Easting	Northing	Description
Group 1 – During construction at the pipeline shore approach at LPS (KP17.4 - 18.2), West Lamma Channel (KP14.5 - 17.4)			
IM1	829453	806896	Impact Station for Coastline of South Lamma
IM2	828235	810347	Impact Station for Coastline of North Lamma
E1	827317	811510	Control Station for Ebb Tide
F1	827892	804243	Control Station for Flood Tide
Group 2 – During construction at the Double Berth Jetty to West Lamma Channel (KP0.0 - 14.5)			
IM3	820683	805931	Impact Station for Coastline of South Cheung Chau
IM4	816997	805153	Impact Station for Coastline of South Shek Kwu Chau
IM5	814068	804100	Boundary of South Lantau Marine Park (MP)
IM6	814073	802029	Boundary of South Lantau MP
E2	813367	808213	Control Station for Ebb Tide
F2	822532	802161	Control Station for Flood Tide
F3	815032	801161	Control Station for Flood Tide
Group 3 – During construction at the Jetty Approach (KP0.0 - 5.0), South of Soko Islands (KP5.0 - 8.9), Southwest of Soko Islands (KP8.9 - 12.1)			
IM6	814073	802029	Boundary of South Lantau MP
IM7	811652	802029	Boundary of South Lantau MP
IM8	810833	801430	Boundary of South Lantau MP
IM9	807101	801595	Boundary of South Lantau MP
E3	802686	804123	Control Station for Ebb Tide
F3	815032	801161	Control Station for Flood Tide
Group 4 – During construction at the Adamasta Channel (KP12.1 - 15.6), Southwest Lantau (KP15.6 - 21.3)			
IM10	803145	806407	Boundary of Southwest Lantau MP
IM11A	801914	806510	Boundary of Southwest Lantau MP
IM12	801041	807024	Boundary of Southwest Lantau MP
IM13	800386	810750	Boundary of Southwest Lantau MP
IM14	801376	810750	Boundary of Southwest Lantau MP

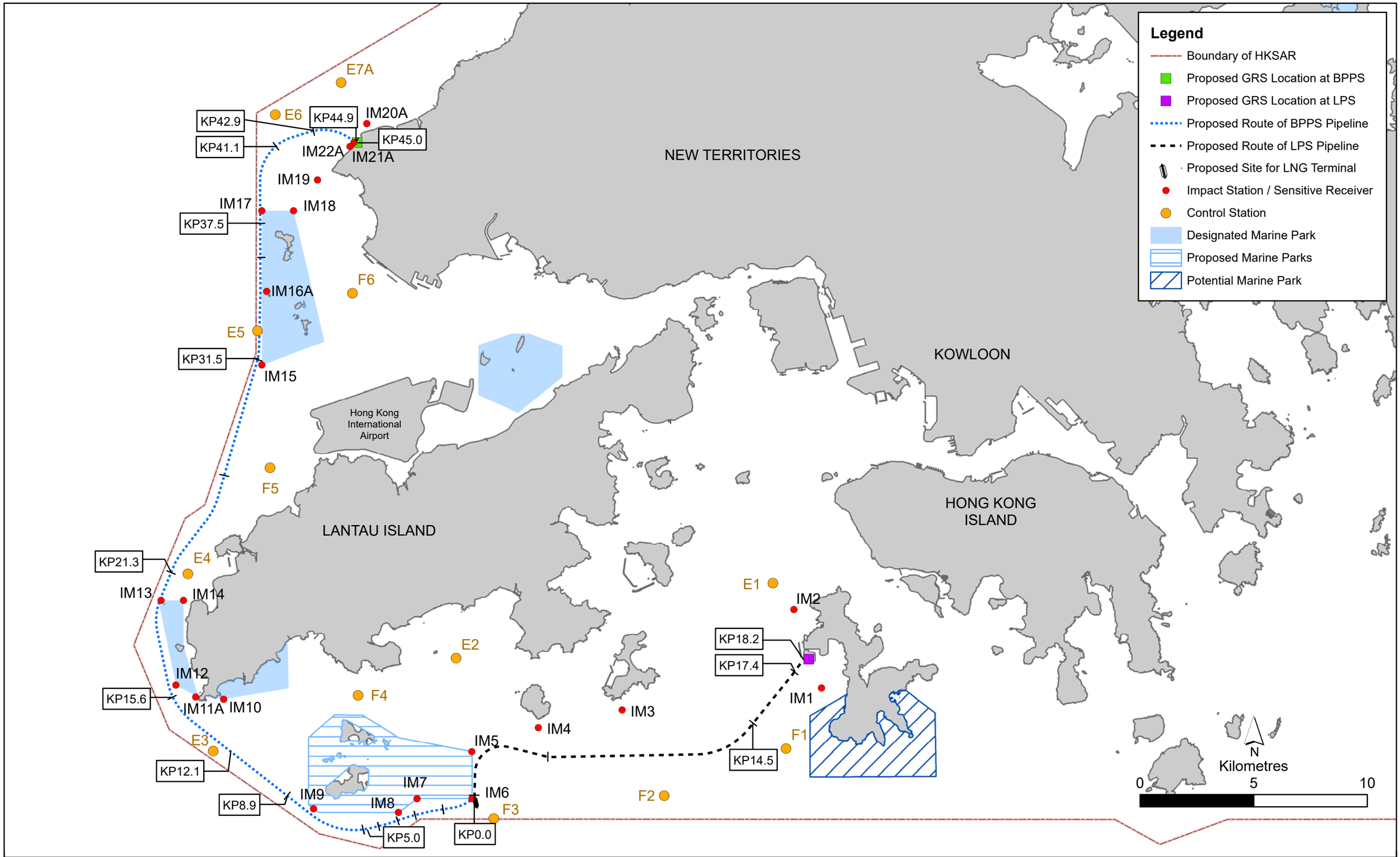


Figure 2.1

Marine Water Quality Monitoring Location

File: T:\GIS\CONTRACT\0505354\mxd\0505354_Updated_Water_Quality_Monitoring_Locations.mxd
Date: 1/2/2021

Environmental Resources Management

ERM

Station	Easting	Northing	Description
E4	801571	811923	Control Station for Ebb Tide
F4	809058	806567	Control Station for Flood Tide
Group 5 – During construction at the West of Tai O to West of HKIA (KP21.3 - 31.5)			
IM15	804820	821110	Boundary of Sha Chau and Lung Kwu Chau MP
E5	804634	822606	Control Station for Ebb Tide
F5	805185	816591	Control Station for Flood Tide
Group 6 – During construction at the West of HKIA to Lung Kwu Chau (KP31.5 - 37.5)			
IM15	804820	821110	Boundary of Sha Chau and Lung Kwu Chau MP
IM17	804865	827855	Boundary of Sha Chau and Lung Kwu Chau MP
IM16A	805039	824343	Coral Colonies at Pak Chau
E6	805418	832113	Control Station for Ebb Tide
F5	805185	816591	Control Station for Flood Tide
Group 7 – During construction at the Lung Kwu Chau to Urmston Anchorage (37.5 - 41.1), Urmston Road (KP41.1 - 42.9)			
IM17	804865	827855	Boundary of Sha Chau and Lung Kwu Chau MP
IM18	806220	827890	Boundary of Sha Chau and Lung Kwu Chau MP
IM19	807274	829250	Impact Station for Coastline of Lung Kwu Tan
E6	805418	832113	Control Station for Ebb Tide
F6	808812	824266	Control Station for Flood Tide
E5	804634	822606	Control Station for Flood Tide
Group 8 – During construction at the West of BPPS (KP42.9 - 44.9), Pipeline shore approach at BPPS (KP44.9 - 45.0)			
IM19	807274	829250	Impact Station for Coastline of Lung Kwu Tan
IM20A	809445	831728	Impact Station for Coastline of Deep Bay
IM21A	808879	830900	Coral Colony at Artificial Seawall at BPPS
IM22A	808703	830717	Coral Colony at Artificial Seawall at BPPS
E7A	808313	833524	Control Station for Ebb Tide
F6	808812	824266	Control Station for Flood Tide

Note: Alternative monitoring stations (E7A, IM11A, IM16A, IM20A, IM21A & IM22A) were proposed by the ET in consultation with the IEC and approved by EPD in accordance with the provision in Section 5.1 and Section 5.2.5 of the Updated EM&A Manual.

2.3.2 Action and Limit Levels for Marine Water Quality Monitoring

The Action and Limit Levels for marine water quality monitoring have been established based on the baseline marine water quality monitoring data in accordance with the Updated EM&A Manual. Action and Limit Levels of key assessment parameters for construction phase marine water quality monitoring including DO, turbidity and SS are summarised in ***Table 2.6***.

Table 2.6 Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Action Level	Limit Level
Group 1 – During construction at the pipeline shore approach at LPS (KP17.4 - 18.2), West Lamma Channel (KP14.5 - 17.4)		
DO in mg L^{-1} [a]	Surface and Middle 4.2 mg L^{-1} Bottom 2.4 mg L^{-1}	Surface and Middle 2.9 mg L^{-1} Bottom 1.6 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	14.4 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	19.9 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	20.8 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	29.6 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 2 – During construction at the Double Berth Jetty to West Lamma Channel (KP0.0 - 14.5)		

Parameter	Action Level	Limit Level
DO in mg L^{-1} [a]	Surface and Middle 3.4 mg L^{-1} Bottom 1.8 mg L^{-1}	Surface and Middle 2.4 mg L^{-1} Bottom 1.4 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	17.1 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	26.8 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	25.7 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	37.1 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 3 – During construction at the Jetty Approach (KP0.0 - 5.0), South of Soko Islands (KP5.0 - 8.9), Southwest of Soko Islands (KP8.9 - 12.1)		
DO in mg L^{-1} [a]	Surface and Middle 4.1 mg L^{-1} Bottom 2.7 mg L^{-1}	Surface and Middle 3.0 mg L^{-1} Bottom 2.0 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	17.0 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	30.9 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	22.3 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	36.9 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 4 – During construction at the Adamasta Channel (KP12.1 - 15.6), Southwest Lantau (KP15.6 - 21.3)		
DO in mg L^{-1} [a]	Surface and Middle 3.4 mg L^{-1} Bottom 2.8 mg L^{-1}	Surface and Middle 2.5 mg L^{-1} Bottom 2.0 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	63.1 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	165.7 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	75.4 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	121.8 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 5 – During construction at the West of Tai O to West of HKIA (KP21.3 - 31.5)		
DO in mg L^{-1} [a]	Surface and Middle 4.6 mg L^{-1} Bottom 4.0 mg L^{-1}	Surface and Middle 4.0 mg L^{-1} Bottom 2.0 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	31.9 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	46.6 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	64.9 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	72.5 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 6 – During construction at the West of HKIA to Lung Kwu Chau (KP31.5 - 37.5)		
DO in mg L^{-1} [a]	Surface and Middle 4.4 mg L^{-1} Bottom 3.9 mg L^{-1}	Surface and Middle 3.9 mg L^{-1} Bottom 2.0 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	30.7 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	47.0 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day

Parameter	Action Level	Limit Level
SS in mg L^{-1} (Depth-averaged [b]) [c]	49.2 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	74.0 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 7 – During construction at the Lung Kwu Chau to Urmston Anchorage (37.5 - 41.1), Urmston Road (KP41.1 - 42.9)		
DO in mg L^{-1} [a]	Surface and Middle 3.8 mg L^{-1} Bottom 3.1 mg L^{-1}	Surface and Middle 3.4 mg L^{-1} Bottom 2.0 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	34.5 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	79.2 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	37.8 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	98.2 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day
Group 8 – During construction at the West of BPPS (KP42.9 - 44.9), Pipeline shore approach at BPPS (KP44.9 - 45.0)		
DO in mg L^{-1} [a]	Surface and Middle 4.3 mg L^{-1} Bottom 3.6 mg L^{-1}	Surface and Middle 3.4 mg L^{-1} Bottom 2.0 mg L^{-1}
Turbidity in NTU (Depth-averaged [b]) [c]	34.3 NTU, and 120% of the relevant control station's turbidity at the same tide of the same day	58.5 NTU, and 130% of the relevant control station's turbidity at the same tide of the same day
SS in mg L^{-1} (Depth-averaged [b]) [c]	42.4 mg L^{-1}, and 120% of the relevant control station's SS at the same tide of the same day	78.2 mg L^{-1}, and 130% of the relevant control station's SS at the same tide of the same day

Notes:
a. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
b. "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
c. For Turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

The Event and Action Plan for marine water quality monitoring is provided in ***Table 2.7***.

Table 2.7 Event and Action Plan for Marine Water Quality Monitoring

Event	Action			
	ET	IEC	Contractor(s)	Project Proponents
Action Level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Check monitoring data, plant, equipment and Contractor(s)'s working methods; 3. Identify source(s) of impact and record in notification of exceedance; 4. Inform IEC, Contractor(s) and Project Proponents.	1. Check monitoring data submitted by ET and Contractor(s)'s working methods.	1. Confirm receipt of notification of exceedance in writing; 2. Check plant and equipment and rectify unacceptable practice.	1. Confirm receipt of notification of exceedance in writing.
Action Level being exceeded by two or more consecutive sampling days	1. Repeat *in-situ* measurement to confirm findings; 2. Check monitoring data, plant, equipment and Contractor(s)'s working methods; 3. Identify source(s) of impact and record in notification of exceedance; 4. Inform IEC, Contractor(s) and Project Proponents; 5. Discuss with IEC and Contractor(s) on additional mitigation measures and ensure that they are implemented.	1. Check monitoring data submitted by ET and Contractor(s)'s working methods; 2. Discuss with ET and Contractor(s) on additional mitigation measures and advise Project Proponents accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of exceedance in writing; 2. Check plant and equipment and rectify unacceptable practice; 3. Consider changes of working methods; 4. Discuss with ET and IEC on additional mitigation measures and propose them to Project Proponents within 3 working days; 5. Implement the agreed mitigation measures.	1. Confirm receipt of notification of exceedance in writing; 2. Discuss with the IEC on the proposed additional mitigation measures and agree on the mitigation measures to be implemented; 3. Ensure additional mitigation measures are properly implemented.

Event	Action			
	ET	**IEC**	**Contractor(s)**	**Project Proponents**
Limit Level being exceeded by one sampling day	1. Repeat *in situ* measurement to confirm findings; 2. Check monitoring data, plant, equipment and Contractor(s)'s working methods; 3. Identify source(s) of impact and record in notification of exceedance; 4. Inform IEC, Contractor(s), Project Proponents and EPD; 5. Discuss with IEC and Contractor(s) on additional mitigation measures and ensure that they are implemented.	1. Check monitoring data submitted by ET and Contractor(s)'s working methods; 2. Discuss with ET and Contractor(s) on additional mitigation measures and advise Project Proponents accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of exceedance in writing; 2. Check plant and equipment and rectify unacceptable practice; 3. Critically review the need to change working methods; 4. Discuss with ET and IEC on additional mitigation measures and propose them to Project Proponents within 3 working days; 5. Implement the agreed mitigation measures.	1. Confirm receipt of notification of exceedance in writing; 2. Discuss with the IEC on the proposed additional mitigation measures and agree on the mitigation measures to be implemented; 3. Ensure additional mitigation measures are properly implemented; 4. Request Contractor(s) to critically review the working methods.
Limit Level being exceeded by two or more consecutive sampling days	1. Repeat *in situ* measurement to confirm findings; 2. Check monitoring data, plant, equipment and Contractor(s)'s working methods; 3. Identify source(s) of impact and record in notification of exceedance; 4. Inform IEC, Contractor(s), Project Proponents and EPD; 5. Discuss with IEC and Contractor(s) on additional mitigation measures and ensure that they are implemented.	1. Check monitoring data submitted by ET and Contractor(s)'s working methods; 2. Discuss with ET and Contractor(s) on additional mitigation measures and advise Project Proponents accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of exceedance in writing; 2. Check plant and equipment and rectify unacceptable practice; 3. Critically review the need to change working methods; 4. Discuss with ET and IEC on additional mitigation measures and propose them to Project Proponents within 3 working days; 5. Implement the agreed mitigation measures; 6. As directed by Project Proponents, slow down or stop all or part of the marine construction works until no exceedance of Limit Level.	1. Confirm receipt of notification of exceedance in writing; 2. Discuss with the IEC on the proposed additional mitigation measures and agree on the mitigation measures to be implemented; 3. Ensure additional mitigation measures are properly implemented; 4. Request Contractor(s) to critically review the working methods; 5. Consider and instruct, if necessary, the Contractor(s) to slow down or to stop all or part of the marine construction works until no exceedance of Limit Level.

2.3.3 Monitoring Results

A total of 166 monitoring events for construction phase marine water quality monitoring were conducted for construction of BPPS Pipeline and LPS Pipeline within the works area(s) for the associated marine-based activities during the construction phase. The percentage compliance of marine water quality monitoring results within the corresponding Action and Limit Levels is presented in ***Table 2.8***. There were no Project-related Action and Limit Level exceedances for marine water quality monitoring during the construction phase. Graphical presentations are provided in ***Annex F***.

Table 2.8 Percentage Compliance of Marine Water Quality Monitoring Data within Action and Limit Levels

Month/Year	DO (Surface and Middle)	DO (Bottom)	Turbidity	SS
Group 1 – During construction at the pipeline shore approach at LPS (KP17.4 - 18.2), West Lamma Channel (KP14.5 - 17.4)				
Oct 2020 – Sep 2021	100%	94.4%	100%	100%
Oct 2021 – Sep 2022	N/A	N/A	N/A	N/A
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	94.4%	100%	100%
Group 2 – During construction at the Double Berth Jetty to West Lamma Channel (KP0.0 - 14.5)				
Oct 2020 – Sep 2021	100%	94.2%	100%	100%
Oct 2021 – Sep 2022	100%	100%	98.7%	100%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	95.5%	99.4%	100%
Group 3 – During construction at the Jetty Approach (KP0.0 - 5.0), South of Soko Islands (KP5.0 - 8.9), Southwest of Soko Islands (KP8.9 - 12.1)				
Oct 2020 – Sep 2021	100%	100%	100%	99.0%
Oct 2021 – Sep 2022	100%	100%	98.9%	98.4%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	100%	99.1%	98.8%
Group 4 – During construction at the Adamasta Channel (KP12.1 - 15.6), Southwest Lantau (KP15.6 - 21.3)				
Oct 2020 – Sep 2021	N/A	N/A	N/A	N/A
Oct 2021 – Sep 2022	100%	100%	100%	98.6%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	100%	100%	98.6%
Group 5 – During construction at the West of Tai O to West of HKIA (KP21.3 - 31.5)				
Oct 2020 – Sep 2021	100%	100%	100%	100%
Oct 2021 – Sep 2022	100%	100%	100%	100%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	100%	100%	100%
Group 6 – During construction at the West of HKIA to Lung Kwu Chau (KP31.5 - 37.5)				

Month/Year	DO (Surface and Middle)	DO (Bottom)	Turbidity	SS
Oct 2020 – Sep 2021	N/A	N/A	N/A	N/A
Oct 2021 – Sep 2022	100%	100%	99.0%	100%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	100%	99.0%	100%
Group 7 – During construction at the Lung Kwu Chau to Urmston Anchorage (37.5 - 41.1), Urmston Road (KP41.1 - 42.9)				
Oct 2020 – Sep 2021	100%	100%	89.1%	90.7%
Oct 2021 – Sep 2022	100%	100%	100%	100%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	100%	94.6%	95.8%
Group 8 – During construction at the West of BPPS (KP42.9 - 44.9), Pipeline shore approach at BPPS (KP44.9 - 45.0)				
Oct 2020 – Sep 2021	100%	97.9%	96.9%	96.9%
Oct 2021 – Sep 2022	100%	100%	100%	100%
Oct 2022 – Jun 2023	N/A	N/A	N/A	N/A
Total	100%	99.1%	99.1%	99.1%

Notes:
(1) The figures in percentage are calculated with reference to the number of depth-averaged data with the corresponding Action and Limit Levels divided by the total number of depth-averaged data for each monitoring parameter.
(2) N/A denotes that no marine water quality monitoring (WQM) was required to be conducted in the annual period.

In general, the levels of DO, turbidity and SS complied with the Action and Limit Levels during most of the time (~ >95%). Investigations on all the Action and/or Limit Levels exceedances were carried out in accordance with the Event and Action Plan for marine WQM, and all the exceedances were considered non-Project related based on the investigation results which have been presented in *the corresponding Monthly EM&A Reports*.

Notwithstanding, the Contractor was reminded to ensure the mitigation measures for water quality impacts as set out in the Updated EM&A Manual are fully and properly implemented.

2.3.4 Comparison of Monitoring Results with EIA Predictions

SS and DO levels in terms of SS elevation and DO depletion, respectively, at each sensitive receiver as a result of marine-based construction activities were assessed and predicted in the approved EIA Report. With reference to *Figures 7.2* and *7.3* of the approved EIA Report, 22 impact stations and the corresponding sensitive receivers and/or model observation points are presented in ***Table 2.9***.

Table 2.9 Impact Stations for Marine Water Quality Monitoring and the Corresponding Sensitive Receivers and Model Observation Points

Impact Station	Fisheries Sensitive Receiver	Ecological Sensitive Receiver	Water Quality Sensitive Receiver	Model Observation Point
Group 1 – During construction at the pipeline shore approach at LPS (KP17.4 - 18.2), West Lamma Channel (KP14.5 - 17.4)				
IM1	▪ Fisheries Spawning/ Nursery Grounds in South Lantau (B8, B9, MPE)	▪ Potential South Lamma MP (MPE) ▪ Corals at Hung Shing Yeh and Ha Mei Wan (CR20, CR21)	▪ Gazetted Beaches at Hung Shing Yeh Beach and Lo So Shing Beach (B8, B9) ▪ Seawater Intake at Lamma Power Station (C13)	▪ N/A
IM2	▪ N/A	▪ Corals at Shek Kok Tsui and Pak Kok (CR12, CR13)	▪ N/A	▪ N/A
Group 2 – During construction at the Double Berth Jetty to West Lamma Channel (KP0.0 - 14.5)				
IM3	▪ Fisheries Spawning/ Nursery Grounds in South Lantau (NB9)	▪ N/A	▪ Non-gazetted Beaches at Po Yue Wan (NB9)	▪ N/A
IM4	▪ Fisheries Spawning/ Nursery Grounds in South Lantau (CR4)	▪ Corals at Shek Kwu Chau (CR4)	▪ N/A	▪ N/A
IM5	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPD-6)
IM6	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPD-5)
Group 3 – During construction at the Jetty Approach (KP0.0 - 5.0), South of Soko Islands (KP5.0 - 8.9), Southwest of Soko Islands (KP8.9 - 12.1)				
IM6	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPD-5)
IM7	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPD-4)
IM8	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPD-3)
IM9	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPD-2)
Group 4 – During construction at the Adamasta Channel (KP12.1 - 15.6), Southwest Lantau (KP15.6 - 21.3)				
IM10	▪ N/A	▪ Intertidal Mudflats/ Mangroves/ Horseshoe Crab Nursery Grounds at Fan Lau Tung Wan (MPC-5)	▪ Non-gazetted Beaches at Fan Lau Tung Wan (NB4)	▪ Boundary of existing and proposed MPs (MPC-5)
IM11A	▪ N/A	▪ N/A	▪ Non-gazetted Beaches at Fan Lau Sai Wan (NB3)	▪ Boundary of existing and proposed MPs (MPC-4)

Impact Station	Fisheries Sensitive Receiver	Ecological Sensitive Receiver	Water Quality Sensitive Receiver	Model Observation Point
IM12	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPC-3)
IM13	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPC-2)
IM14	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPC-1)
Group 5 – During construction at the West of Tai O to West of HKIA (KP21.3 - 31.5)				
IM15	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPA-3)
Group 6 – During construction at the West of HKIA to Lung Kwu Chau (KP31.5 - 37.5)				
IM15	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPA-3)
IM16A	▪ Fisheries Spawning Ground in North Lantau (CR3) ▪ Artificial Reef Deployment Area at Sha Chau and Lung Kwu Chau (AR1)	▪ Sha Chau and Lung Kwu Chau MP (MPA-5) ▪ Corals at Pak Chau (CR3)	▪ N/A	▪ N/A
IM17	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPA-2)
Group 7 – During construction at the Lung Kwu Chau to Urmston Anchorage (37.5 - 41.1), Urmston Road (KP41.1 - 42.9)				
IM17	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPA-2)
IM18	▪ N/A	▪ N/A	▪ N/A	▪ Boundary of existing and proposed MPs (MPA-1)
IM19	▪ N/A	▪ Intertidal Mudflats/ Mangroves/ Horseshoe Crab Nursery Grounds at Lung Kwu Sheung Tan (NB1)	▪ Non-gazetted Beaches at Lung Kwu Sheung Tan (NB1)	▪ N/A
Group 8 – During construction at the West of BPPS (KP42.9 - 44.9), Pipeline shore approach at BPPS (KP44.9 - 45.0)				
IM19	▪ N/A	▪ Intertidal Mudflats/ Mangroves/ Horseshoe Crab Nursery Grounds at Lung Kwu Sheung Tan (NB1)	▪ Non-gazetted Beaches at Lung Kwu Sheung Tan (NB1)	▪ N/A

Impact Station	Fisheries Sensitive Receiver	Ecological Sensitive Receiver	Water Quality Sensitive Receiver	Model Observation Point
IM20A	▪ N/A	▪ Intertidal Mudflats/ Mangroves/ Horseshoe Crab Nursery Grounds at Ha Pak Nai (H1) ▪ Seagrass Beds at Ha Pak Nai (H1)	▪ Seawater Intake at Sludge Treatment Facilities (C1)	▪ N/A
IM21A	▪ N/A	▪ Corals at Artificial Seawall at BPPS (CR1)	▪ N/A	▪ N/A
IM22A	▪ N/A	▪ Corals at Artificial Seawall at BPPS (CR2)	▪ N/A	▪ N/A

2.3.4.1 Suspended Solids Elevation

For the marine WQM stations under Group 1 and Group 2 (i.e. IM1 and IM2 for Group 1; and IM3, IM4, IM5 and IM6 for Group 2), all SS levels at these marine WQM stations were within the corresponding Action/Limit Levels resulting in being in line with the EIA predictions (i.e. compliance with Water Quality Objective (WQO) for SS in terms of percentage in both dry and wet seasons under Dredging Scenario C01A and Jetting Scenario C06 as reported in *Table 7C.1* and *Table 7C.8* of *Annex 7C* in the approved EIA Report, respectively).

For the marine WQM stations under Group 3 (i.e. IM6, IM7, IM8, IM9), all SS levels at these marine WQM stations were within the corresponding Action/Limit Levels except that at IM8 and IM9 with Action Level exceedances recorded, resulting in 98.8% being within the corresponding Action/Limit Levels. Given the Action Level exceedances in SS recorded at IM8 and IM9 were considered non-Project related upon investigation, all SS levels were considered being generally in line with the EIA predictions (i.e. compliance with WQO for SS in terms of percentage in both dry and wet seasons under Dredging Scenario C01A, Jetting Scenario C05 and Jetting Scenario C06 as reported in *Tables 7C.1, 7C.7 and 7C.8* of *Annex 7C* in the approved EIA Report).

For the marine WQM stations under Group 4 (i.e. IM10, IM11A, IM12, IM13, IM14), all SS levels at these marine WQM stations were within the corresponding Action/Limit Levels except that at IM11A and IM13 with Action Level exceedances recorded, resulting in 98.6% being within the corresponding Action/Limit Levels. Given the Action Level exceedances in SS recorded at IM11A and IM13 were considered non-Project related upon investigation, all SS levels were considered being generally in line with the EIA predictions (i.e. compliance with WQO for SS in terms of percentage in both dry and wet seasons under Jetting Scenario C05 as reported in *Table 7C.7* of *Annex 7C* in the approved EIA Report).

For the marine WQM station under Group 5 and Group 6 (i.e. IM15 for Group 5 and IM15, IM16A, IM17 for Group 6), all SS levels at these marine WQM stations were within the corresponding Action/Limit Levels resulting in being in line with the EIA predictions (i.e. compliance with WQO for SS in terms of percentage in both dry and wet seasons under Jetting Scenario C04 as reported in *Table 7C.6* of *Annex 7C* in the approved EIA Report).

For the marine WQM stations under Group 7 (i.e. IM17, IM18 and IM19), most of the SS levels at these stations were within the corresponding Action/Limit Levels except for some occasions, resulting in 95.8% being within the corresponding Action/Limit Levels. Given the Action/Limit Level exceedances in SS recorded at the marine WQM stations on these dates were considered non-Project related upon investigation, all SS levels were considered being generally in line with the EIA predictions (i.e. compliance with WQO for SS in terms of percentage in both dry and wet seasons

under Dredging Scenario C01C and Dredging Scenario C03 as reported in *Table 7C.3 and Table 7C.5* of *Annex 7C* in the approved EIA Report).

For the marine WQM stations under Group 8 (i.e. IM19, IM20A, IM21A and IM22A), most of the SS levels at these stations were within the corresponding Action/Limit Levels except the one at IM19 with Action Level exceedance recorded, resulting in 99.1% being within the corresponding Action/Limit Levels. Given the Action Level exceedance in SS recorded at IM19 on the date was considered non-Project related upon investigation, all SS levels were considered being generally in line with the EIA predictions (i.e. compliance with WQO for SS in terms of percentage in both dry and wet seasons under Dredging Scenario C01A and Dredging Scenario C02 as reported in *Table 7C.1* and *Table 7C.4* of *Annex 7C* in the approved EIA Report).

2.3.4.2 Dissolved Oxygen Depletion

According to *Annex 7D* of the approved EIA Report, the predicted maximum DO depletion values for all sensitive receivers associated with marine-based construction activities are well below their corresponding allowable DO depletion values, of which the maximum DO depletion of 0.2 mg/L amongst all sensitive receivers was predicted and no unacceptable depletion of DO from the marine-based construction activities was also anticipated as documented in the approved EIA Report (*see Section 7.7.1 of the approved EIA Report*).

Despite the Action/Limit Level exceedances in DO were recorded, all were considered non-Project related upon investigation, implying that the DO levels at the relevant sensitive receivers were considered being generally in line with the EIA predictions as reported in *Table 7D.1* of *Annex 7D* in the approved EIA Report.

2.3.4.3 Review of Monitoring Methodology for Marine Water Quality

The monitoring methodology for marine water quality was reviewed, including the routine operations of marine water quality monitoring associated with construction phase marine water quality monitoring data, the monitoring was able to detect change in water quality with reference to the EIA predictions based on the monitoring data in terms of DO and SS levels. Therefore, the monitoring methodology for marine water quality is considered effective and no change to monitoring methodology is recommended.

2.4 Pilot Test on the Efficiency of Silt Curtain System

2.4.1 Monitoring Requirements

According to Condition 2.10 of FEP-02/558/2018/A and FEP-03/558/2018/B, and Section 5.3.2 of the Updated EM&A Manual, pilot tests on the efficiency of silt curtain system shall be conducted during the early stage of construction to confirm the removal efficiency of the silt curtains. The pilot tests on the efficiency of silt curtain system include i) testing of silt removal efficiency of 75% or higher for silt curtain at grab dredger; ii) testing of silt removal efficiency of 85% or higher for silt curtain at jetting machine; and iii) testing of silt removal efficiency of 80% or higher for double layer silt curtain at sensitive receivers, as determined by the difference between the SS levels near marine works area and that outside silt curtain in the event of the dredging / jetting operations being actively undertaken for BPPS Pipeline and/or LPS Pipeline. The detailed methodology of the pilot tests on the efficiency of silt curtain system is presented in the approved Silt Curtain Deployment Plans for the corresponding FEPs.

2.4.2 Monitoring Results

Four sets of pilot tests on the efficiencies of silt curtain system were conducted and each is discussed below:

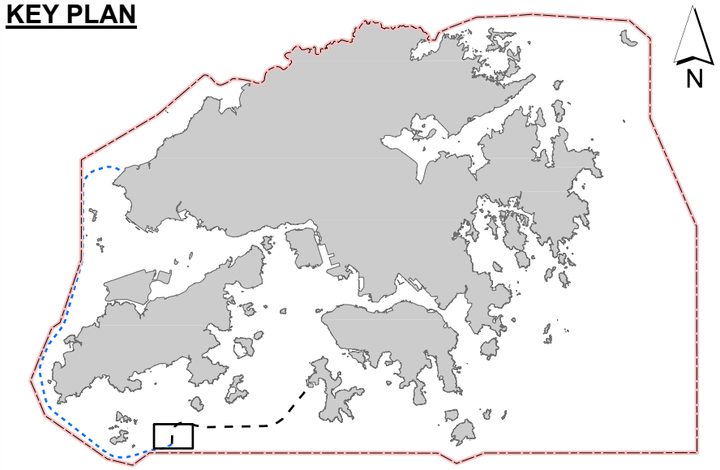
- Pilot test on efficiency of cage-type silt curtain at grab dredgers for LPS Pipeline was conducted on 2 February 2021 during dredging operation for construction of LPS Pipeline in accordance with the methodology presented in the approved Silt Curtain Deployment Plan. Three rounds of monitoring (i.e. Rounds 1, 2 & 3) for the pilot test covering ebb and flood tides were conducted when dredging operation was operated at or close to the maximum productivity for LPS Pipeline. The dredging work rate ranged from 230 – 255 m^3/hr, which is equivalent to 5,520 – 6,120 m^3/day for 24 hours work. The monitoring stations for the pilot test are presented in ***Figure 2.2***.
- Pilot test on efficiency of cage-type silt curtain at grab dredgers for BPPS Pipeline was conducted on 7 June 2021 during dredging operation for construction of BPPS Pipeline in accordance with the methodology presented in the approved Silt Curtain Deployment Plan. Three rounds of monitoring (i.e. Rounds 1, 2 & 3) for the pilot test covering ebb and flood tides were conducted when dredging operation was operated at or close to the maximum productivity for BPPS Pipeline. The dredging work rate for the three rounds of monitoring ranged from 53.57 – 247.33 m^3/hr, which is equivalent to 1,286 – 5,936 m^3/day for 24 hours work. The monitoring stations for the pilot test are presented in ***Figure 2.3***.
- Pilot test on the efficiency of cage-type silt curtain at jetting machine for both LPS and BPPS Pipelines was conducted on 26 August 2021 during the jetting operation of LPS Pipeline in accordance with the methodology presented in the approved Silt Curtain Deployment Plan. Three rounds of monitoring (i.e. Rounds 1, 2 & 3) for the pilot test covering ebb and flood tides were conducted when jetting operation was operated at or close to the maximum productivity for LPS Pipeline. The jetting work rate was about 29.08 m/hr, which is equivalent to 698 m/day for 24 hours work. The monitoring stations for the pilot tests are presented in ***Figure 2.4***.
- Pilot test on the efficiency of double layer silt curtain (i.e. floating silt curtain) at jetting machine was conducted on 18 January 2022 during the jetting operation of BPPS Pipeline in accordance with the methodology presented in the approved Silt Curtain Deployment Plan. Three rounds of monitoring (i.e. Rounds 1, 2 & 3) for the pilot test covering ebb and flood tides (Round 1 and Round 3 were conducted within mid-ebb tide and mid-flood tide, respectively, while Round 2 was scheduled to be conducted in between mid-ebb tide and mid-flood tide due to the first mid-flood tide of the day occurred before 7:00 AM at which no jetting operation shall be operated in accordance with Condition 3.7 of FEP-03/558/2018/B) were conducted when jetting operation was operated at or close to the maximum productivity for BPPS Pipeline. The jetting work rate was about 30 m/hr, which is equivalent to 720 m/day for 24 hours work. The monitoring stations for the pilot test are presented in ***Figure 2.5***.

The monitoring results of the pilot tests are summarised in ***Table 2.10***, showing that the efficiency ranges of cage-type silt curtains and double layer silt curtain were greater than the EIA assumption of 75% and 85% for cage-type silt curtain at grab dredger and jetting machine, respectively; and 80% for floating silt curtain at sensitive receivers. As such, the proposed cage-type silt curtains and floating silt curtain are effective for the dredging and jetting operation for the Project to minimize water quality impacts and no further measures/ recommendations are required. As similar cage-type and floating silt curtains and jetting machine are used for the construction of the BPPS and LPS Pipelines, the pilot test results of cage-type and floating silt curtains for jetting works are applicable for the subsea gas pipeline for BPPS under FEP-03/558/2018/B and the subsea gas pipeline for LPS under FEP-02/558/2018/A.

Legend

- Proposed Route of BPPS Pipeline
- Proposed Route of LPS Pipeline
- Monitoring Locations for Silt Curtain Pilot Test
- Cage-type Silt Curtain
- Boundary of HKSAR

KEY PLAN



Coordinates of Monitoring Stations		
Position	Easting	Northing
A1	814188.60	802071.00
B1	814155.21	802115.87
B2	814246.59	802074.45
B3	814231.89	802017.91
B4	814117.20	802067.40

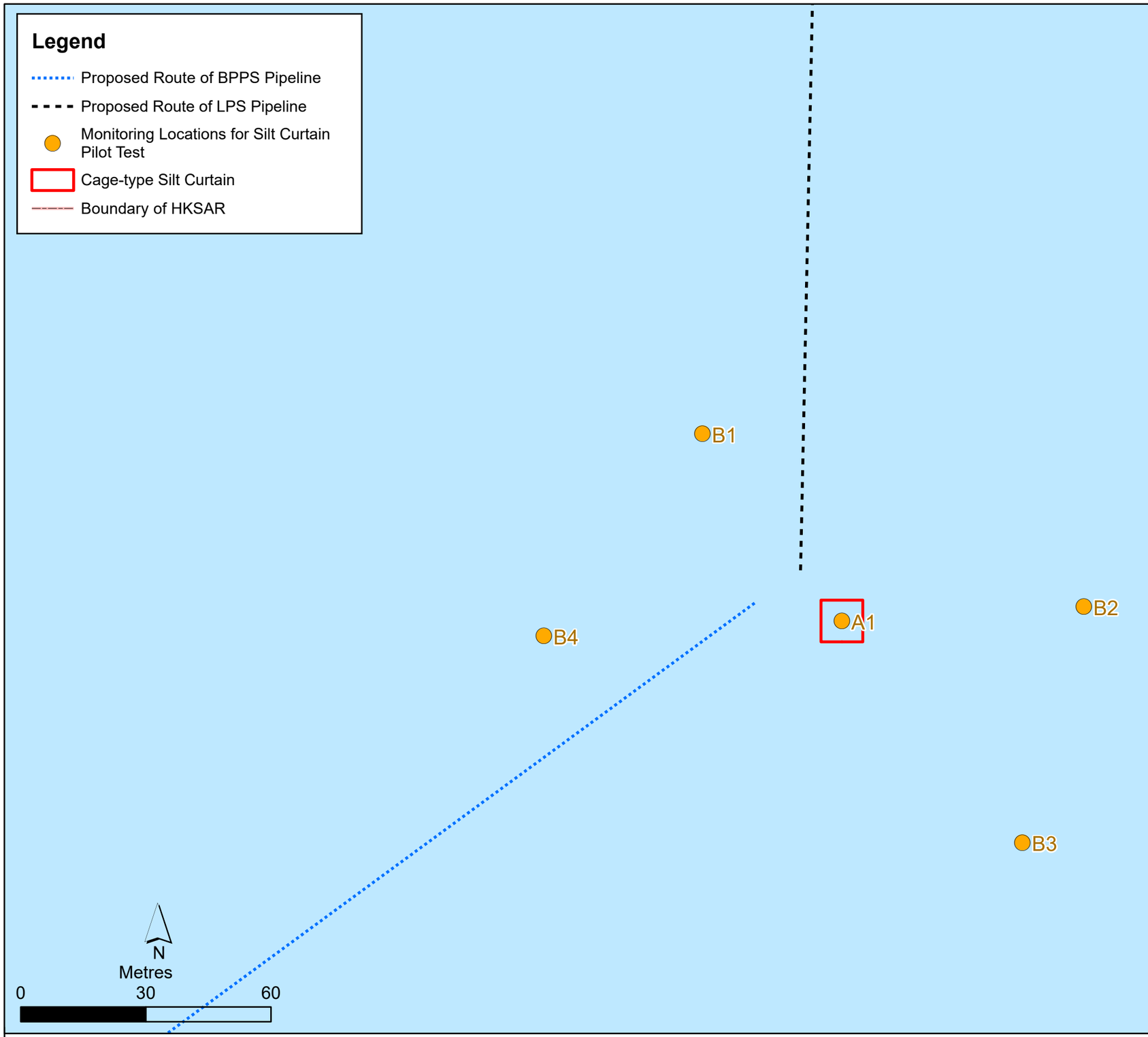


Figure 2.2

Monitoring Locations for Silt Curtain Pilot Test for Dredging Operation

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Date: 8/3/2021

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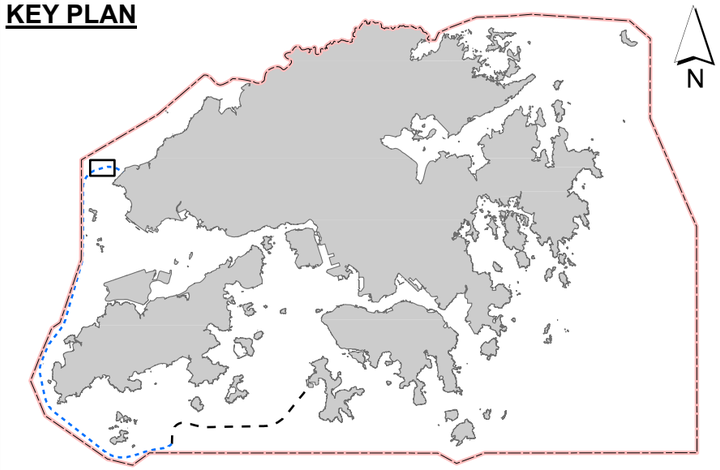
Legend

- Proposed Route of BPPS Pipeline
- Monitoring Locations for Silt Curtain Pilot Test
- Boundary of HKSAR

KEY PLAN



Coordinates of Monitoring Stations		
Position	Easting	Northing
A1	806851	831284
B1	806853	831330
B2	806904	831283
B3	806800	831286
B4	806855	831233

B1

B3

A1

B2

B4

N

Metres

0 30 60

Figure 2.3

Monitoring Locations for Silt Curtain Pilot Test for Dredging Operation

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Date: 22/2/2022

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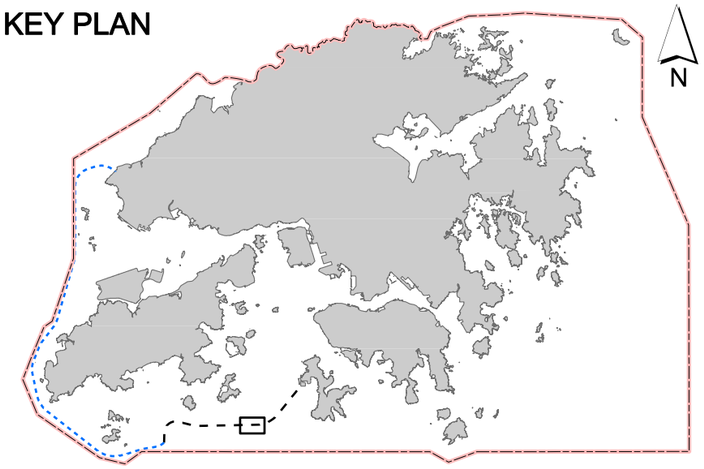
Legend

- Proposed Route of LPS Pipeline
- Monitoring Locations for Silt Curtain Pilot Test
- Boundary of HKSAR

KEY PLAN



Coordinates of Monitoring Locations		
Position	Easting	Northing
A1	824393.5	803988.1
B1	824468.1	804008.0
B2	824355.4	803929.9
B3	824418.6	804042.6
B4	824292.4	803972.8

B3

B1

A1

B4

B2

N

Metres

0 50 100

Figure 2.4

Monitoring Locations for Silt Curtain Pilot Test for Jetting Operation

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Date: 22/2/2022

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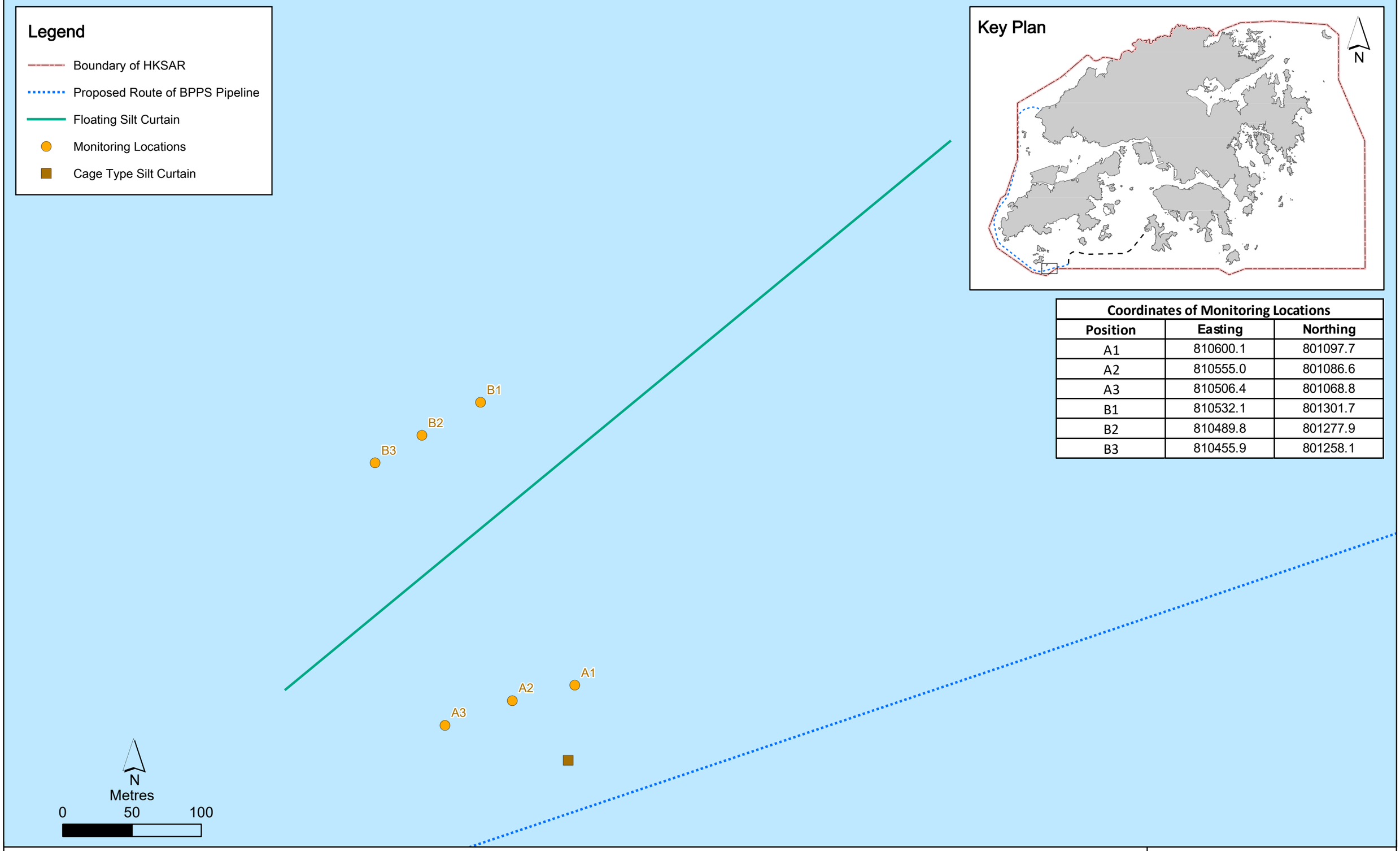
Legend

- Boundary of HKSAR
- Proposed Route of BPPS Pipeline
- Floating Silt Curtain
- Monitoring Locations
- Cage Type Silt Curtain



Key Plan

Coordinates of Monitoring Locations		
Position	**Easting**	**Northing**
A1	810600.1	801097.7
A2	810555.0	801086.6
A3	810506.4	801068.8
B1	810532.1	801301.7
B2	810489.8	801277.9
B3	810455.9	801258.1

Figure 2.5

Monitoring Locations for Floating Silt Curtain Pilot Test for Jetting Operation

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Date: 24/1/2022

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Table 2.10 Efficiencies of Silt Curtain Systems for Dredging and Jetting Operations

Round	Silt Curtain Efficiency (%)	
	Individual	Overall-average
For cage-type silt curtain at grab dredger for LPS Pipeline		
1	N/A	87.01 (Note 1)
2	87.25	
3	86.77	
For cage-type silt curtain at grab dredger for BPPS Pipeline		
1	83.89	92.59
2	96.27	
3	97.61	
For cage-type silt curtain at jetting machine for both BPPS and LPS Pipelines		
1	99.74	96.05
2	99.88	
3	88.54	
For floating silt curtain for jetting works of both BPPS and LPS Pipelines (Note 2)		
1	90.55	90.08
2	87.64	
3	92.05	

Notes:
(1) Only representative SS data for Rounds 2 and 3 of the pilot test were used for determination of silt curtain efficiency with respect to fact that the relatively low SS levels were detected inside silt curtain for the dredging operation during Round 1 of the pilot test.
(2) The SS levels at monitoring stations near the marine works area (i.e. A1 to A3) have been recalculated to exclude the effect of cage-type silt curtain with an assumed silt removal efficiency of 85% for the calculation of efficiency of the floating silt curtain.

2.5 Marine Water Quality Monitoring for Hydrotesting for the Subsea Gas Pipelines

2.5.1 Monitoring Requirements

In accordance with the Updated EM&A Manual, water quality monitoring for hydrotesting for the subsea gas pipelines would be conducted before, during and after discharge of hydrotest water for the two subsea gas pipelines at the nearest sensitive receiver (i.e. IM6) and nearby control station(s) (i.e. E2 and / or F3 depending on the tidal state) as shown in ***Figure 2.6*** and ***Table 2.11***. As agreed with IEC, one water quality monitoring event would be conducted within one week prior to hydrotesting discharge for each pipeline, water quality monitoring would be conducted at a frequency of three times per week capturing the timing of hydrotesting discharge as far as practicable, and only one water quality monitoring event would be conducted after one week of completion of hydrotesting discharge for both pipelines. For a single water quality monitoring event, two rounds of measurement would be conducted during flood tide and two rounds of measurement would be conducted during ebb tide and each round of monitoring for each tide would be separated by at least an hour. Two replicates of *in-situ* measurements and samples would be collected at each monitored water depth of each monitoring stations. Levels of DO, pH value, salinity, temperature and turbidity were measured *in-situ*.

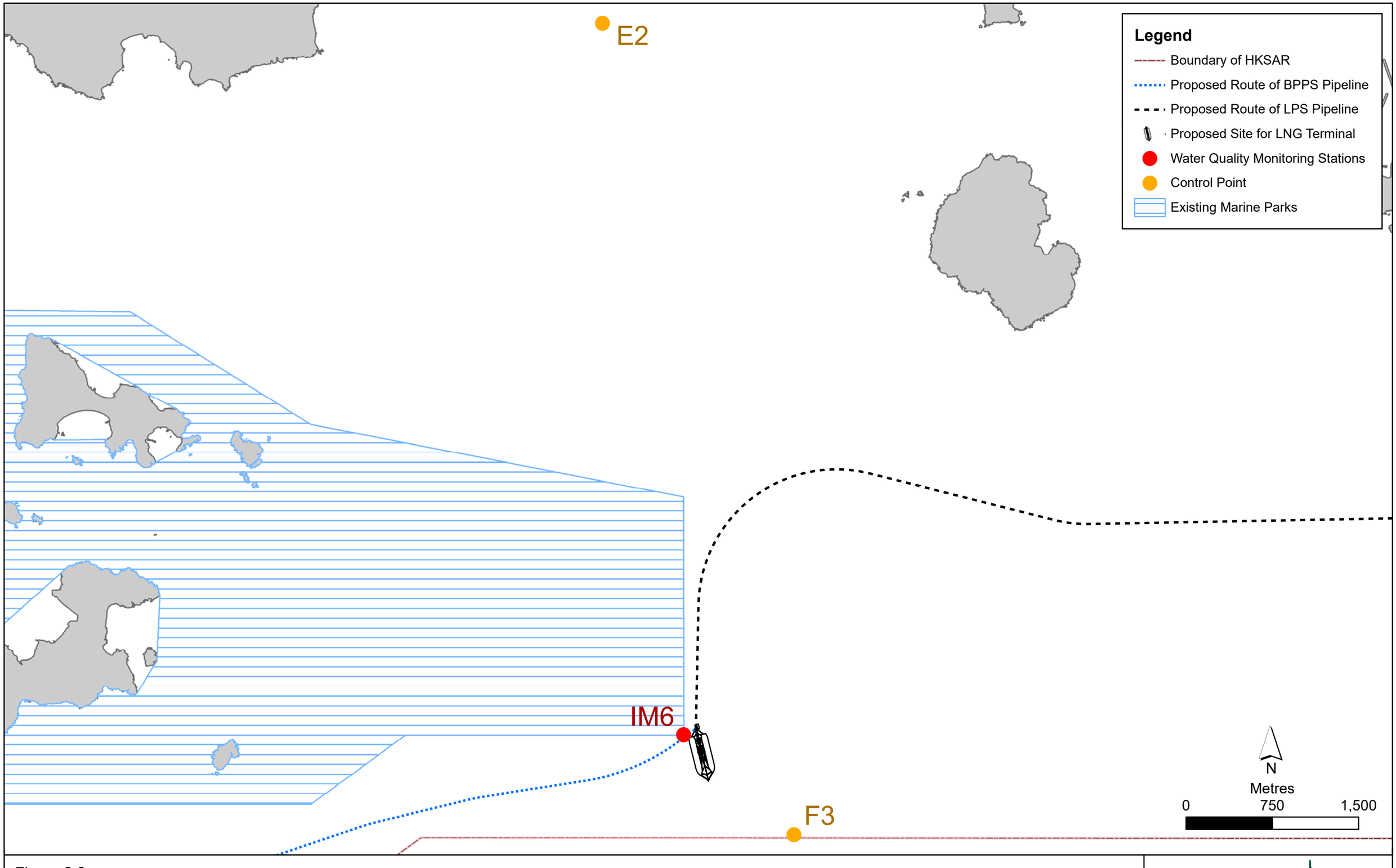

Figure 2.6

Water Quality Monitoring Locations for Hydrotesting for the Subsea Gas Pipelines

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Date: 24/4/2020

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Table 2.11 Location of Water Quality Monitoring Station for Hydrotesting for the Subsea Gas Pipelines

Station	Easting	Northing	Description
IM6	814073	802029	Boundary of South Lantau MP
F3	815032	801161	Control Station for Flood Tide
E2	813367	808213	Control Station for Ebb Tide

2.5.2 Action and Limit Levels for Marine Water Quality Monitoring for Hydrotesting for the Subsea Gas Pipelines

As predicted in the water quality modelling, there would be depletion of DO due to hydrotest discharge and thus the Action and Limit Levels of DO were established. The Action and Limit Levels for marine water quality monitoring for hydrotesting for the subsea gas pipelines were established based on the baseline marine water quality monitoring data. In addition, the representativeness of the data was reviewed with reference to the water quality monitoring data obtained within one week before hydrotest discharge for the LPS and BPPS Pipelines. The water quality monitoring for hydrotesting of LPS Pipeline and BPPS Pipeline before discharge were conducted on 16 August 2022 and 10 September 2022, respectively and the monitoring results showed that the levels of DO ranged from 5.5-10.6 mg/L (Surface and Middle) and 4.1-6.4 mg/L (Bottom) at the monitoring stations and were within the ranges of DO obtained from the baseline marine water quality monitoring before construction of the Project. It is thus considered that the baseline marine water quality monitoring data for Group 3 where Station IM6 is located are still valid and representative for establishing the Action and Limit Levels. The Action and Limit Levels of DO are presented in ***Table 2.12***.

Table 2.12 Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Action Level	Limit Level
During operation phase		
DO in mg L^{-1} [a]	Surface and Middle 4.1 mg L^{-1} Bottom 2.7 mg L^{-1}	Surface and Middle 3.0 mg L^{-1} Bottom 2.0 mg L^{-1}

Note:
a. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

The Event and Action Plan for marine water quality monitoring can be referred to *the Updated EM&A Manual*.

2.5.3 Monitoring Results

A total of 18 monitoring events for marine water quality monitoring for hydrotesting for the LPS and BPPS Pipelines during discharge were conducted. One water quality monitoring event was conducted on 29 October 2022 after one week of completion of hydrotesting discharge for both pipelines. The monitoring results were presented in the respective *Monthly EM&A Reports*. There were no Project-related Action and Limit Level exceedances for marine water quality monitoring for hydrotesting for the LPS and BPPS Pipelines. The results of water quality monitoring after completion of hydrotesting discharge for both pipelines also indicated that there was no unacceptable change on the levels of DO and thus the hydrotest discharges for both pipelines did not result in unacceptable change in water quality.

2.6 Post-construction Water Quality Monitoring

2.6.1 Monitoring Requirements

In accordance with the Updated EM&A Manual, post-construction water quality monitoring shall be undertaken at the 35 monitoring stations as shown in ***Figure 2.1*** and ***Table 2.5*** three times a week at both mid-ebb and mid-flood tides for four weeks upon completion of marine construction activities for the Project, in the same manner as the baseline monitoring, except total residual chlorine (TRC) would not be measured during post-construction monitoring. The interval between two sets of monitoring would not be less than 36 hours. Two replicates of *in-situ* measurements and samples were collected at each monitored water depth of each monitoring stations. Levels of DO, pH value, salinity, temperature and turbidity were measured *in-situ* whereas the level of SS were determined by a HOKLAS accredited laboratory. The detailed methodology is presented in the Updated EM&A Manual.

2.6.2 Action and Limit Levels for Marine Water Quality Monitoring

The Action and Limit Levels for marine water quality monitoring have been established based on the baseline marine water quality monitoring data in accordance with the Updated EM&A Manual. Action and Limit Levels of key assessment parameters for construction phase marine water quality monitoring including DO, turbidity and SS are summarised in ***Table 2.6***. The Event and Action Plan for marine water quality monitoring is provided in ***Table 2.7***.

2.6.3 Monitoring Results

Post-construction water quality monitoring was conducted three times a week for four weeks between 7 November and 2 December 2022 at the 35 monitoring stations as shown in ***Figure 2.1*** and ***Table 2.5***.

No observable pollution source was recorded at the monitoring stations and no marine construction works were observed in the vicinity of all monitoring stations during the post-construction monitoring period. The monitoring results are thus considered representative. The water quality monitoring results showed that the levels of DO, Turbidity and SS varied across monitoring stations (both control and impact stations) and over time. The levels of DO, Turbidity and SS were within the respective ranges obtained in the baseline water quality monitoring conducted in 2019-2020. Graphical presentations are provided in ***Annex F***. The detailed monitoring results have been reported in the *Post-Construction Water Quality Monitoring Report*.

Overall, deterioration of water quality and indirect impacts at water and ecological sensitive receivers were not detected. The construction of the Project did not result in unacceptable water quality impacts to the nearby water and ecological sensitive receivers, which aligns with the EIA study predictions.

2.7 Marine Mammal Monitoring

2.7.1 Monitoring Requirements

2.7.1.1 Vessel-based Line Transect Survey

In accordance with the Updated EM&A Manual, vessel-based marine mammal survey by means of systematic line-transect boat survey was undertaken to examine the distribution and encounter rate of Finless Porpoise (FP) in southern Lantau where a majority of Project construction works would take place. Survey transects covered three survey areas for line-transect boat surveys, namely Southwest Lantau (SWL), Southeast Lantau (SEL) and Lamma (LM) are presented in ***Figure 2.7***. The methodology of the survey is consistent and compatible with that adopted in the EIA baseline surveys as well as the long-term marine mammal monitoring programme conducted by AFCD since 1995 to

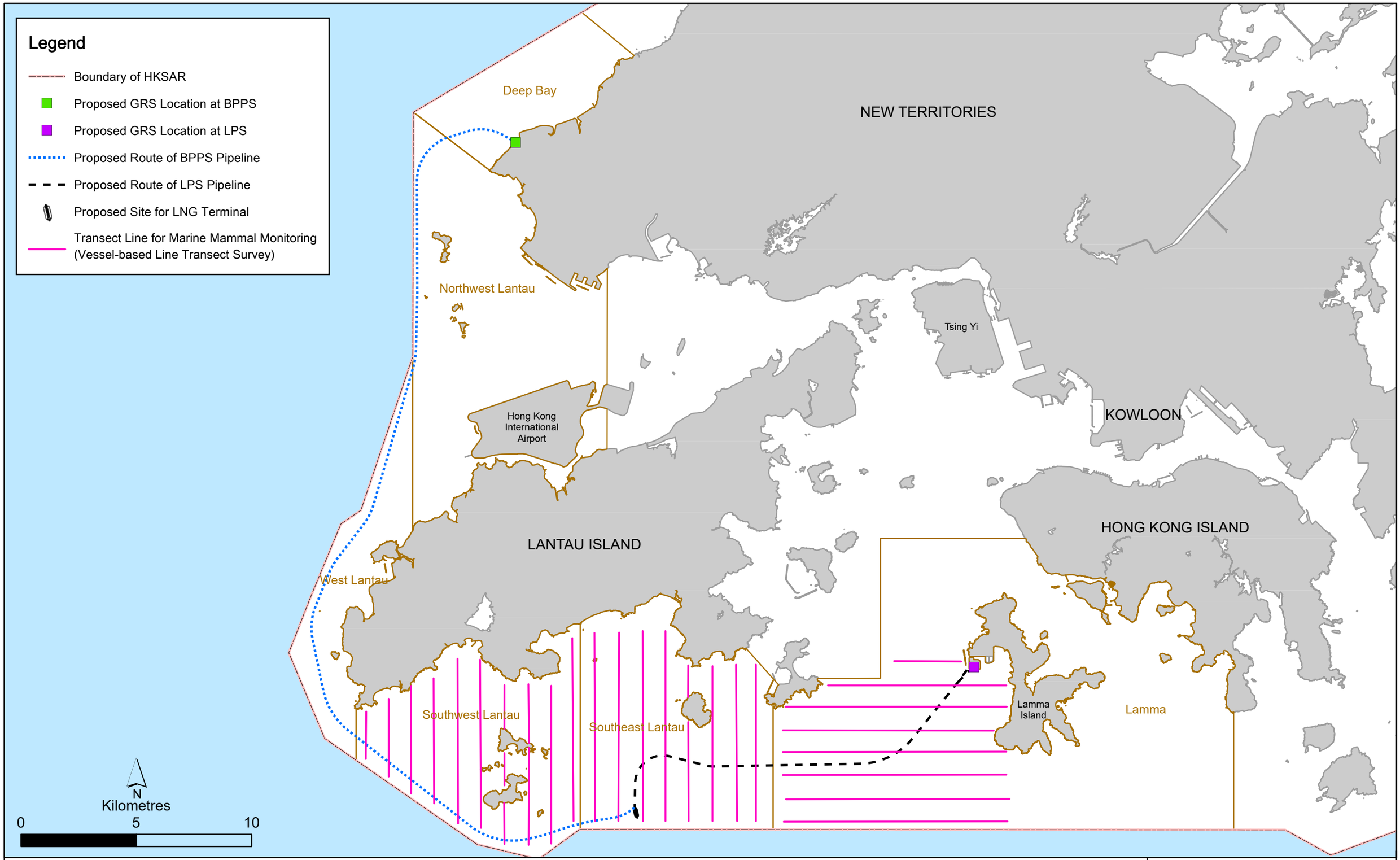

Figure 2.7

Vessel-Based Marine Mammal Survey Location

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Date: 22/2/2022

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allow potential comparisons and pooling data for analysis. Vessel-based line transect marine mammal surveys are conducted during construction of the LNG Terminal. Each transect line is surveyed twice per month. The detailed methodology is presented in the Updated EM&A Manual.

2.7.1.2 Passive Acoustic Monitoring (PAM)

In accordance with the Updated EM&A Manual, underwater PAM survey using C-POD (Cetacean-Porpoise Detector) was conducted at five locations as presented in ***Figure 2.8***. C-PODs are left in place during construction of the LNG Terminal. Such duration should allow for a robust record of marine mammal usage of the area to be obtained and allow for the inter-seasonal differences already known for finless porpoises. The C-PODs have to be serviced every two to four months, subject to review on an as-needed basis, to download accumulated data and replace batteries.

2.7.2 Action and Limit Levels for Marine Mammal Monitoring

The Action and Limit Levels for marine mammal monitoring are established using encounter rate calculated from the six-month baseline vessel-based line transect surveys from the three survey areas as a whole in accordance with the Updated EM&A Manual. The combined baseline encounter rate will be used to compare with the encounter rate obtained during construction phase monitoring calculated from last three month's monitoring data (i.e. running quarterly value). This approach would allow natural seasonal fluctuations in FP encounter rate to be accounted for, and allow data to be reviewed every month such as appropriate remedial actions could be taken timely if the threshold values are triggered. The Action and Limit Levels are provided in ***Table 2.13***.

Table 2.13 Action and Limit Levels for Marine Mammal Monitoring

Monitoring Area	Action Level	Limit Level
SWL, SEL and LM as a whole	Running quarterly STG < 1.12 & ANI < 2.18	Two consecutive running quarterly STG < 1.12 & ANI < 2.18

Notes:
STG = Encounter Rate of Number of Porpoise Sightings
ANI = Encounter Rate of Number of Porpoises
Action / Limit Levels will be triggered if both STG and ANI fall below the criteria.

The Event and Action Plan for marine mammal monitoring is provided in ***Table 2.14***.

Legend

- Boundary of HKSAR
- Proposed Route of BPPS Pipeline
- Proposed Route of LPS Pipeline
- Proposed Site for LNG Terminal
- Proposed South Lantau Marine Park
- Open Sea Disposal Area
- Proposed Safety Zone
- C-POD Deployment Location
- Submarine Cable
- Power Lines
- Pipeline

C-POD Deployment Location			
ID	Longitude	Latitude	Water Depth (m)
1	113° 55' 10.201" E	22° 09' 46.379" N	13
2	113° 56' 43.723" E	22° 09' 30.563" N	14
3	113° 57' 09.118" E	22° 09' 30.592" N	14.7
4	113° 57' 13.030" E	22° 10' 23.959" N	14.1
5	113° 59' 50.741" E	22° 11' 26.794" N	14

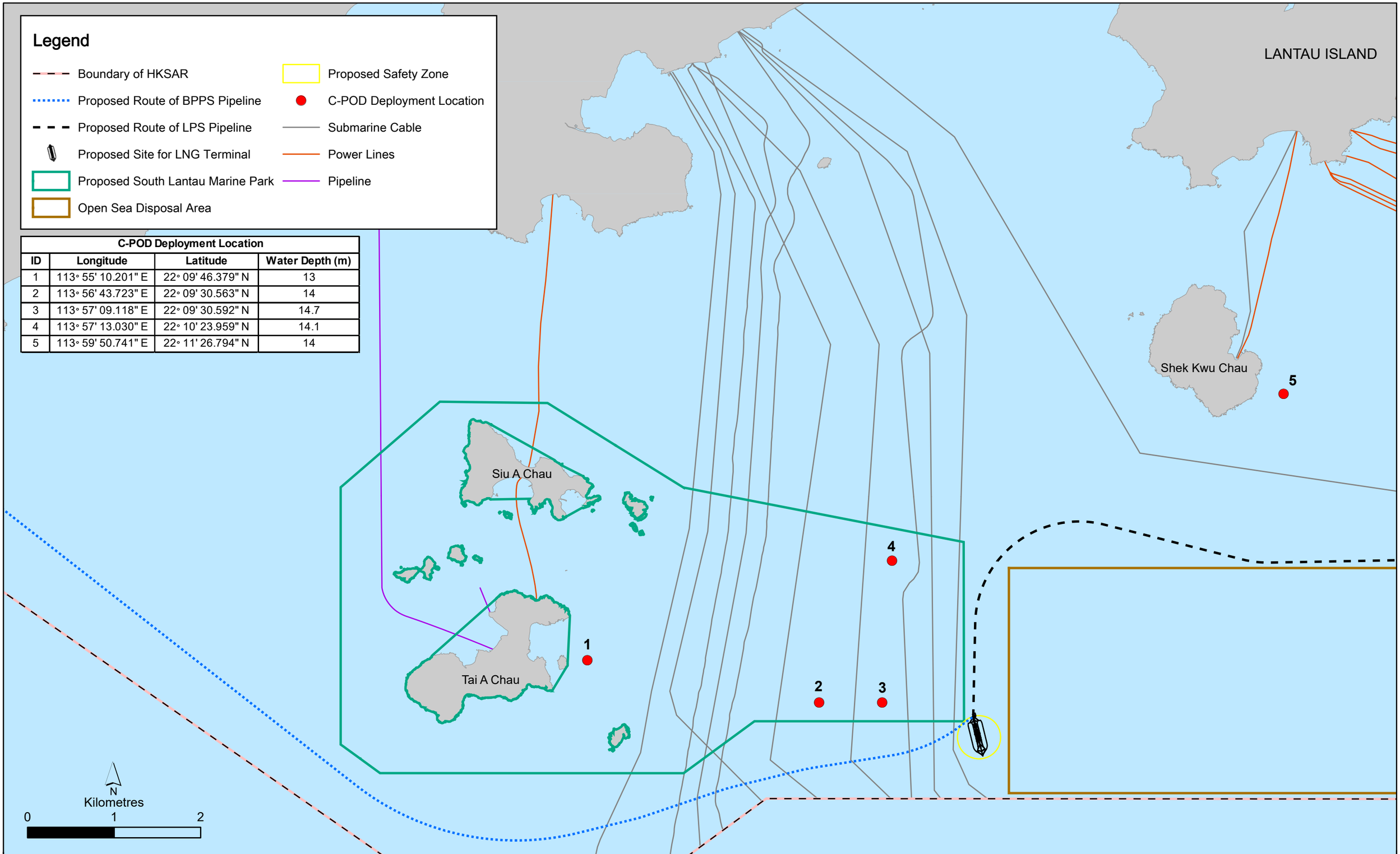

Figure 2.8

Underwater PAM Survey Location

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Date: 22/2/2022

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Table 2.14 Event and Action Plan for Marine Mammal Monitoring

Event	Action			
	ET	IEC	Contractor(s)	Project Proponents
Action Level exceeded	1. Check monitoring data and repeat data analysis to confirm findings; 2. Review available AFCD data and relevant EM&A data to check if the exceedance is due to natural variation or works related; 3. Identify potential source(s) of impact; 4. Inform the IEC, Project Proponents and Contractor; 5. Increase site inspection and audit frequency to ensure all the marine mammal protective and/or precautionary measures are properly implemented.	1. Check monitoring data and analysis and investigation by ET; 2. Conduct additional site inspection and audit with ET to ensure all the marine mammal protective and/or precautionary measures are properly implemented and advise Project Proponents the audit results and findings accordingly.	1. Inform the Project Proponents and confirm notification of the non-compliance in writing; 2. Conduct site inspection and audit with the ETL and IEC; 3. Ensure all the marine mammal protective and/or precautionary measures are properly implemented.	1. Discuss the need for increased site inspection and audit frequency proposed by ET with IEC and the Contractor; 2. Check the audit results and findings from ET and IEC.
Limit Level exceeded	1. Check monitoring data and repeat data analysis to confirm findings; 2. Review available AFCD data and relevant EM&A data to check if the exceedance is due to natural variation or works related; 3. Identify potential source(s) of impact; 4. Inform the IEC, Project Proponents and Contractor; 5. Increase site inspection and audit frequency to ensure all the marine mammal protective and/or precautionary measures are properly implemented; 6. Review previous occurrence of non-compliance events to investigate if there is a longer term trend that needs attention; 7. ET to discuss and confirm with Project Proponents, IEC and Contractor on the need for further mitigation measures (e.g. consider controlling and, if necessary suspending marine works associated with the suspected source of impact).	1. Check monitoring data and analysis and investigation by ET; 2. Conduct additional site inspection and audit with ET to ensure all the marine mammal protective and/or precautionary measures are properly implemented and advise Project Proponents the audit results and findings accordingly 3. Discuss and confirm further mitigation measures with Project Proponents, ET and Contractor; 4. Supervise / audit the implementation of further mitigation measures and advise Project Proponents the results and findings accordingly.	1. Inform the Project Proponents and confirm notification of the non-compliance in writing; 2. Conduct site inspection and audit with the ETL and IEC; 3. Ensure all the marine mammal protective and/or precautionary measures are properly implemented; 4. Discuss and confirm further mitigation measures with the ETL, IEC and Project Proponents; 5. Carry out further measures when advised by ET and agreed by Project Proponents and IEC.	1. Discuss the need for increased site inspection and audit frequency proposed by ET with IEC and the Contractor; 2. Check the audit results and findings from ET and IEC; 3. Discuss and confirm further mitigation measures with the ET, IEC and Contractor; 4. Supervise the implementation of further mitigation measures.

2.7.3 Monitoring Results

2.7.3.1 Vessel-based Line Transect Survey

A total of 36 vessel-based line transect surveys were conducted during the construction phase of the Project. The FPs sighted in the three survey areas, SWL, SEL and LM are presented in ***Figure 2.9***.

The running quarterly STG and ANI for the combined survey areas from SWL, SEL and LM during the period of piling works are summarised in ***Table 2.15***.

Table 2.15 Running Quarterly STG and ANI for Finless Porpoise

Survey Period	On-effort (km)	No. of Sighting	No. of Porpoise	STG	ANI	Running STG	Running ANI
Dec 2020	219.30	3	7	1.36	3.18	-	-
Jul 2021	375.86	0	0	0.00	0.00	-	-
Aug 2021	379.00	2	10	0.53	2.64	-	-
Sep 2021	331.64	7	22	2.11	6.63	0.83	2.95
Oct 2021	95.79	0	0	0.00	0.00	1.12	3.97
Nov 2021	208.05	10	30	4.81	14.42	2.68	8.18

Notes:
Only data collected at Beaufort Sea State 2 or below were included for encounter rate analysis.
Running STG and Running ANI were calculated by combining three consecutive survey months data (i.e. combining the data with the previous two months).
Marine mammal monitoring between January and June 2021 was not conducted as no piling works for construction of the jetty were carried out between January and June 2021 in accordance with Condition 3.3 of the FEP.

The running quarterly values of encounter rate in terms of STG and ANI were 2.68 and 8.18, respectively. Therefore, there were no breaches of Action and Limit Levels for marine mammal monitoring during the construction phase.

2.7.3.2 Underwater PAM Survey

Summary of PAM Data Collection

Five C-POD units have been deployed at the five locations since the commencement of construction for FEP-01/558/2018/A and PAM data were analysed during the period of piling works of the Project in December 2020 and in July 2021 to early November 2021. The summaries of deployment data are presented in ***Table 2.16*** below. The PAM deployment statistics for each location are provided in the *Quarterly EM&A Summary Report for January to March 2022*.

Variations in porpoise activity per day were observed at all five locations during the period of piling works of the Project in December 2020 and in July 2021 to early November 2021 (see ***Figure 2.10***). The mean porpoise DPM per day at the five locations ranged from 14.9 (Location 5) to 137.9 (Location 2) for the analysed period. Location 5 (Shek Kwu Chau) recorded the least porpoise activity amongst the five locations. Further analysis will be conducted to compare the finless porpoise detection numbers between the baseline, construction and post-construction monitoring upon completion of the post-construction monitoring.

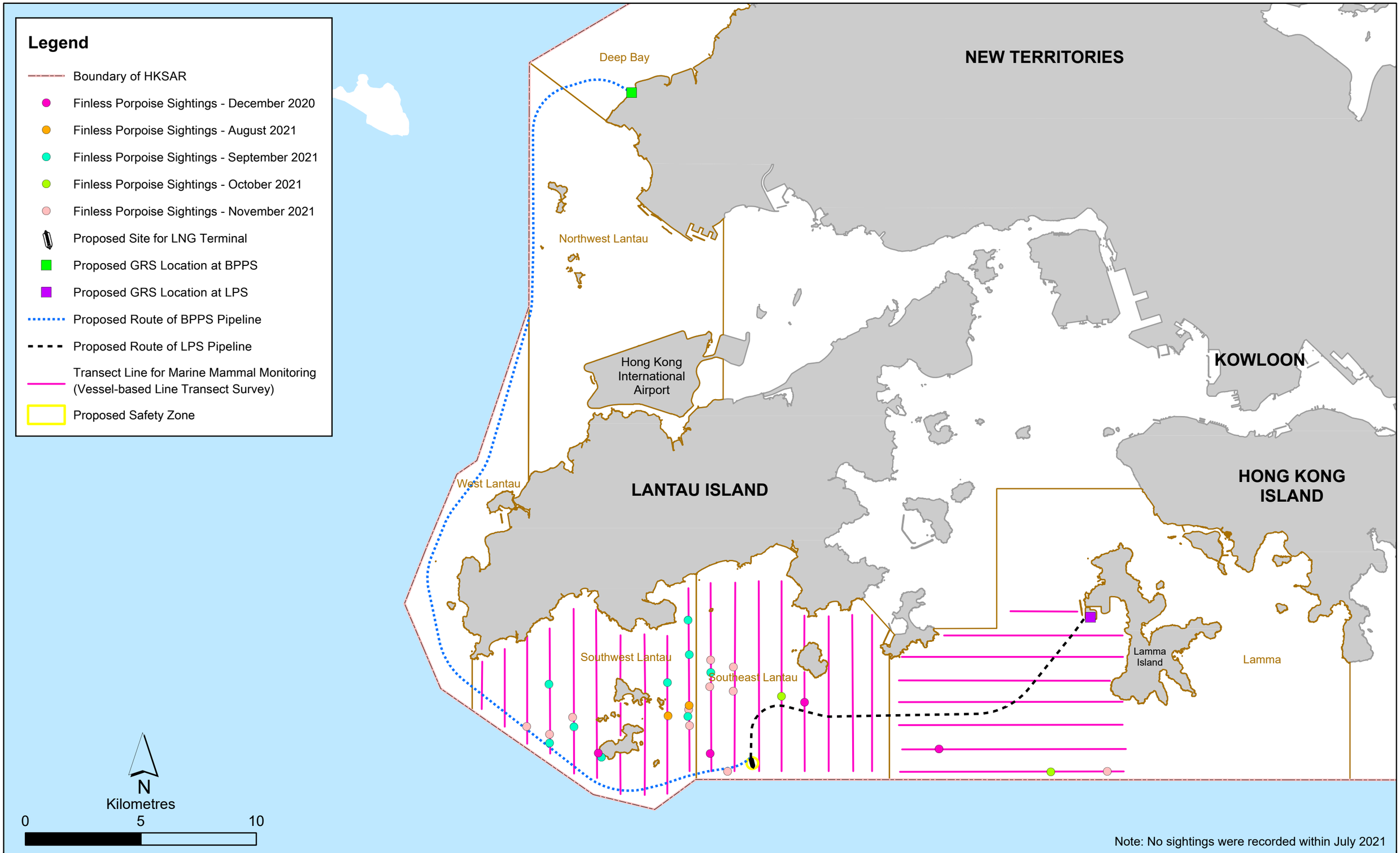

Figure 2.9

Distribution of Finless Porpoise Sightings in December 2020 and July - October 2021

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Date: 18/7/2023

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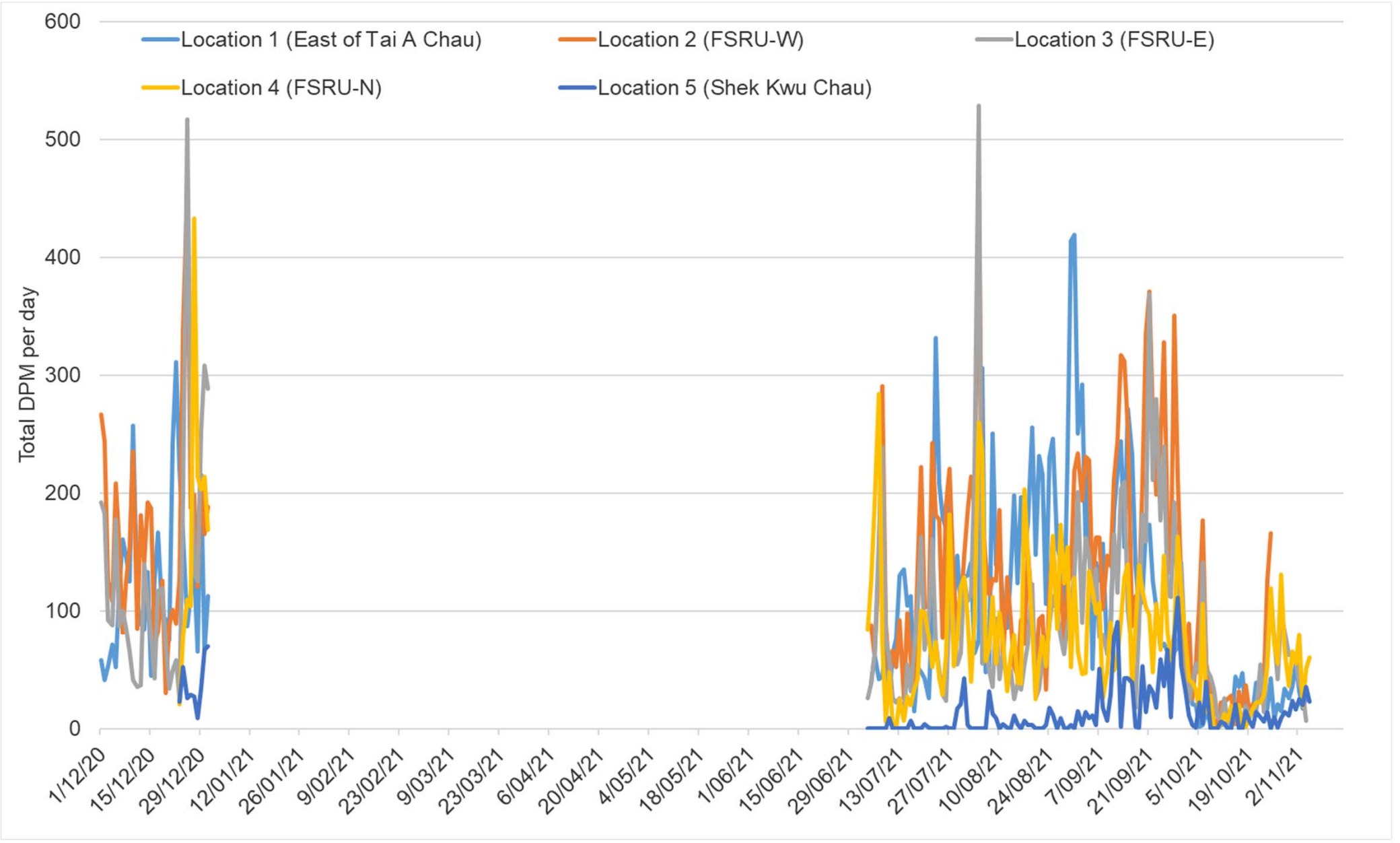

Figure 2.10

Detection Positive Minutes (DPM) per Day for Finless Porpoises among the Five Deployment Locations during the period of piling works of the Project

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Table 2.16 Summary of PAM data for each Location

Location	Data Period (Notes 1, 2 and 3)	No. of Logged Days	Detection Positive Days as a percentage of Logged Days (DPD% of days)	Detection Positive Minutes (DPM)	DPM / Logged Days
Location 1 (East of Tai A Chau)	1-31 Dec 2020 5 Jul – 4 Nov 2021	154	99.4%	17049	110.7
Location 2 (FSRU-W)	1-31 Dec 2020 5 Jul – 25 Oct 2021	144	100%	19854	137.9
Location 3 (FSRU-E)	1-31 Dec 2020 4 Jul – 4 Nov 2021	155	100%	14826	95.7
Location 4 (FSRU-N)	23-31 Dec 2020 4 Jul – 5 Nov 2021	134	97.8%	10762	80.3
Location 5 (Shek Kwu Chau)	23-31 Dec 2020 4 Jul – 5 Nov 2021	134	68.7%	2003	14.9

Notes:

(1) As checked with the marine mammal expert, the PAM data for Location 2 after 25 October 2021 could not be retrieved due to malfunction of the C-POD.

(2) Due to adverse weather, servicing of C-PODs at Locations 4 and 5 was conducted on 22 December 2020 and the data analysed for December 2020 covered the period between 23 and 31 December 2020.

(3) The jacket installation works (i.e. piling works) of the Project were conducted in December 2020, July to early November 2021 and completed on 10 November 2021. The data period presented above covered the majority of the piling works period and are representative to evaluate marine mammal usage of the area and allow for the inter-seasonal differences already known for finless porpoises.

Evaluation of Detection Errors, Loss of Click Detections and Boat Sonar

Visual validation was used to assess the overall rate of false positive porpoise DPM as identified by the KERNO classifier. Such false positives were found to be 0% (with 95% confidence level) at Locations 1-3 (East of Tai A Chau, FSRU-W and FSRU-E), 0-2% at Location 4 (FSRU-N) and 1% at Location 5 (Shek Kwu Chau) during the deployment periods. Inspection of the sampled porpoise DPM found that the majority of false positive were most likely due to misclassified boat sonar.

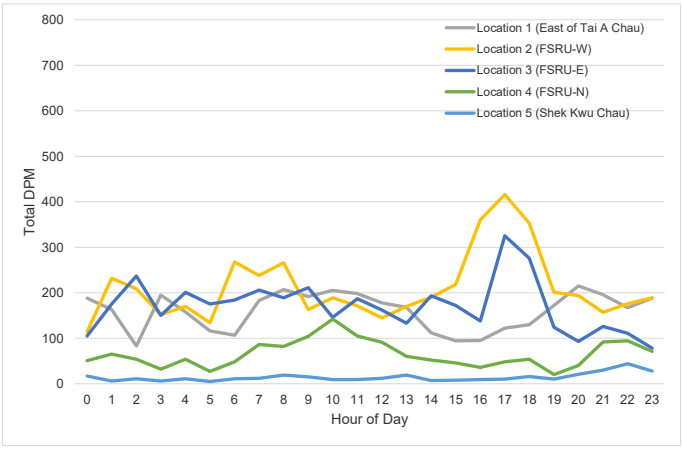
Notably, the minute click limit can be exceeded in very noisy environments, meaning that no further clicks will be detected until the start of the next minutes. However, no time was lost for the deployment periods at all five locations. Moreover, boat sonar was detected throughout the deployment periods at the five locations, and this was generally around 50 kHz.

Diel Patterns on Porpoise Occurrences

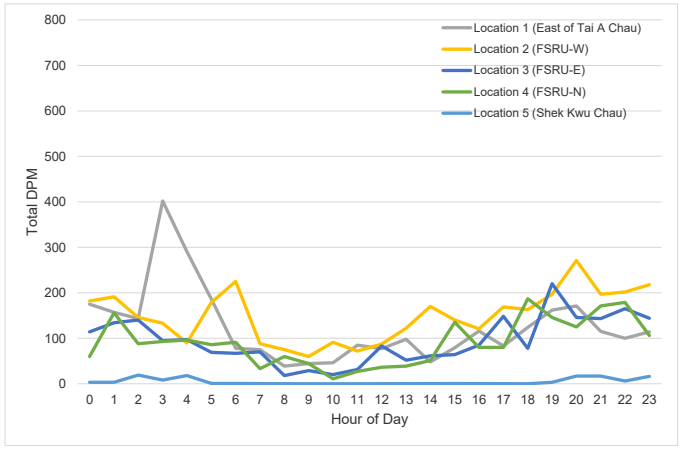
FP activity in different hours of the day at the five locations has been examined and comparison was made on the diel patterns among the five locations by each month in December 2020 and July to October 2021 [(4)] and during the period of piling works of the Project (***Figures 2.11-2.12***). Diel patterns were more distinguishable for Locations 1-4 and there was a decline in porpoise activity from late morning to the middle of the day to some extent. The diel pattern at Location 5 (Southeast of Shek Kwu Chau) was less distinguishable and the total DPM recorded during the period of piling works of the Project were lower than other locations.

(4) As the data analysed for November 2021 covered a few days up to 5 November 2021, the monthly data for November 2021 are not presented in Figure 2.11.

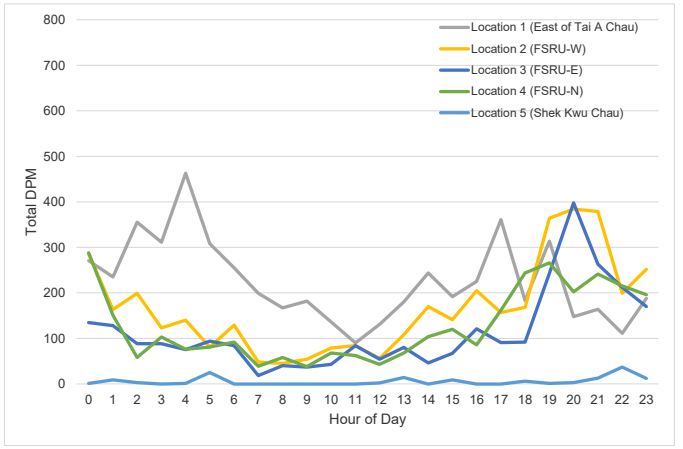
December 2020



July 2021

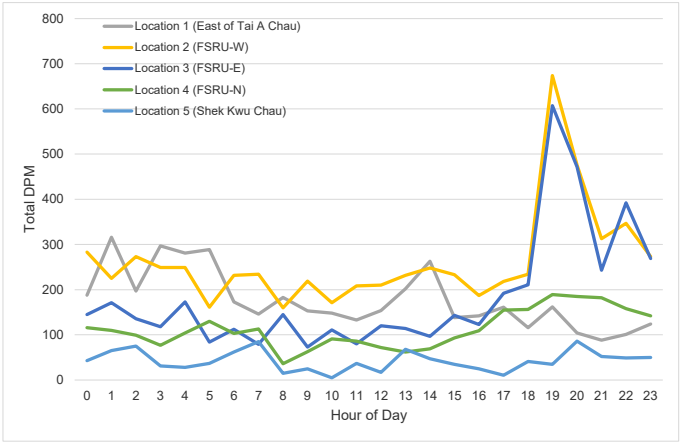


August 2021



Remarks: The data for Locations 4 and 5 covered the period between 23 and 31 December 2020.

September 2021



October 2021

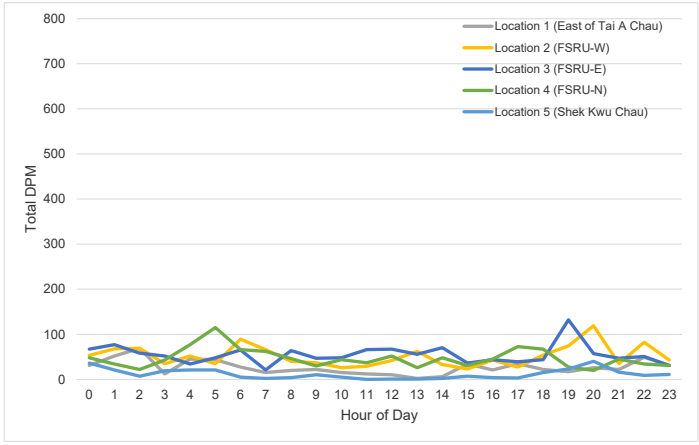


Figure 2.11

Monthly Comparisons on DPM Diel Patterns of Finless Porpoises among the Five Deployment Locations in December 2020 and July – October 2021

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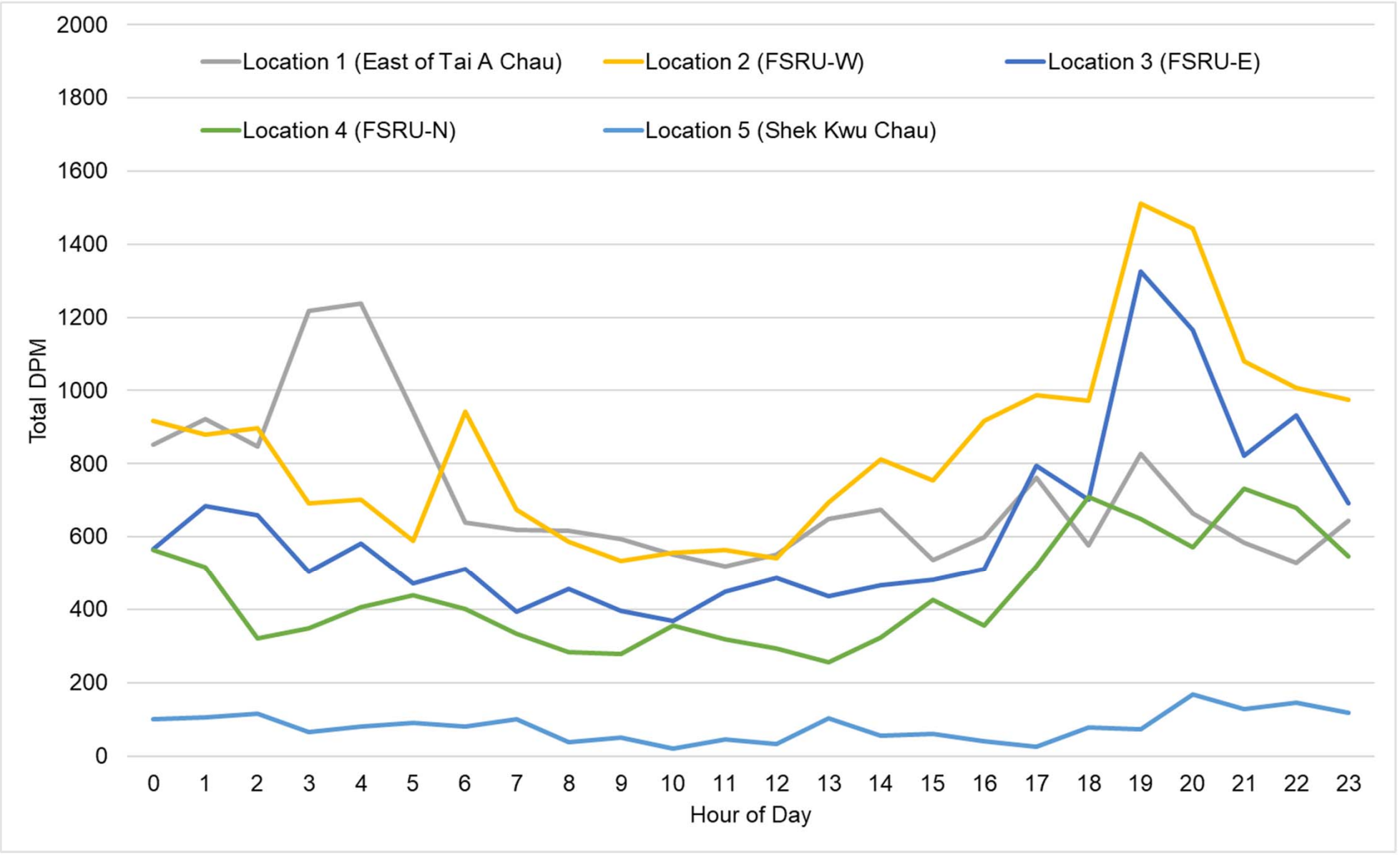

Figure 2.12 DPM Diel Patterns of Finless Porpoises among the Five Deployment Locations during the period of piling works of the Project

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2.7.4 Summary and Comparison of Monitoring Results with EIA Predictions

The jacket installation works (i.e. piling works) of the Project were completed on 10 November 2021. Throughout the period of jacket installation works in December 2020 and July to November 2021, the results of the vessel-based line transect marine mammal surveys indicated that there were no breaches of Action and Limit Levels for marine mammal monitoring, indicating that there were no unacceptable/ unforeseen changes in FP distribution as a result of jacket installation works. It should be noted that with implementation of the recommended mitigation measures during construction phase of the Project, no unacceptable impacts on FPs were anticipated as documented in the approved EIA Report. The recommended mitigation measures have been implemented/ adopted during the course of piling works, including the use of structural jacket and bubble curtain to enclose the pile installation work, acoustic decoupling of noisy equipment on work barges, piling with ramp-up procedures; use of hydraulic hammering with noise reduction system; avoidance of underwater percussive piling at night time and during the peak occurrence season of FP; and monitoring of marine mammal exclusion zone with a radius of 500 m. The review on the encounter rates of FP (i.e. running STG and ANI) ranged from 0.83 to 2.68 (for running STG) and 2.95 to 8.18 (for running ANI), at which no Action / Limit Level exceedances in marine mammal monitoring were triggered during the piling works. Therefore, variation between the EIA study predictions and the EM&A monitoring results was not found.

As the marine mammal monitoring is recommended to determine the efficacy of the recommended mitigation measures and provide verification of impact prediction/ evaluation results which is specific to the impact from underwater sound from Jetty pile installation works, the marine mammal monitoring for construction phase is considered completed in November 2021 following the completion of jacket installation works (i.e. piling works) of the Project. No further construction phase marine mammal monitoring (both vessel-based line transect marine mammal surveys and passive acoustic monitoring) is necessary to be conducted for the remaining works (i.e. topside construction) under the EM&A programme as consulted with EPD and AFCD in late November 2021.

One year post-construction marine mammal monitoring commenced in November 2022 upon completion of marine-based construction activities of the Project in October 2022 to investigate if there are any unacceptable/ unforeseen changes in FP distribution due to the Project construction. The findings of the monitoring, which will be compared with the data obtained during baseline (June - November 2019 for vessel-based line transect marine mammal surveys and October 2019 - March 2020 for passive acoustic monitoring) and construction phase monitoring (December 2020 and July – November 2021 for both vessel-based line transect marine mammal surveys and passive acoustic monitoring), will be reported in the post-construction marine mammal monitoring report upon completion of the monitoring.

2.8 Marine Mammal Exclusion Zone Monitoring

2.8.1 Monitoring Requirements

According to Condition 3.7 of FEP-01/558/2018/A, Condition 3.7 of FEP-02/558/2018/A, Condition 3.8 of FEP-03/558/2018/B, Section 9.11.3 of the approved EIA Report and Section 7 of the Updated EM&A Manual, marine mammal exclusion zone monitoring is required during dredging / jetting operations for construction of BPPS Pipeline or LPS Pipeline and during percussive piling works for construction of the Jetty. Marine mammal exclusion zone requirements are presented in ***Table 2.17***.

Table 2.17 Marine Mammal Exclusion Zone Requirements

Activity	Exclusion Zone	Requirement
Marine dredging or jetting operations for construction of BPPS Pipeline or LPS Pipeline	250m	Before pipeline dredging or jetting commence, the exclusion zone must have been continuously clear of marine mammals for 30 minutes. During pipeline dredging/ jetting, if marine mammals are spotted within the exclusion zone, pipeline dredging/ jetting works will cease and will not resume until the observer confirms that the zone has been continuously clear of marine mammals for a period of 30 minutes.
Percussive piling works for construction of the Jetty	500m	Before percussive piling commences, the exclusion zone must have been continuously clear of marine mammals for 30 minutes. During percussive piling, if marine mammals are spotted within the exclusion zone, percussive piling works will cease and will not resume until the observer confirms that the zone has been continuously clear of marine mammals for a period of 30 minutes.

2.8.2 Monitoring Results

Marine mammal exclusion zone monitoring was conducted when marine dredging and jetting operations for construction of BPPS / LPS Pipeline and percussive piling works for construction of the Jetty were undertaken. No sightings of marine mammals were observed during marine mammal exclusion zone monitoring. The monitoring results for marine mammal exclusion zone monitoring is summarised in ***Table 2.18***.

Table 2.18 Monitoring Results for Marine Mammal Exclusion Zone Monitoring

Date	Active works activities	Monitoring results
11, 12, 14-16, 18, 19, 21 Dec 2020	Percussive piling works for construction of the Jetty	No sightings of marine mammals within the marine mammal exclusion zone
2, 3, 5, 7, 12, 14-17 Jul 2021		
5-7, 9, 11, 13, 14, 21, 23-27 Aug 2021		
13, 16, 18 Sep 2021		
2, 4-7, 15, 19-23, 27-30 Oct 2021		
1-6, 8 Nov 2021		
27 Jan 2021	Marine dredging operation at Double Berth Jetty for LPS Pipeline (1)	
1, 2, 4 Feb 2021		
23, 26, 27 Feb 2021	De-burial (pre-trenching) of pre-installed pipeline by Mass Flow Excavator for LPS Pipeline	
5, 6, 13-15 Mar 2021		
24 Apr 2021	Marine dredging operation at Subsea Cable Sterile Corridors for BPPS Pipeline	
16-28 May 2021		
28-30 Apr 2021	Marine dredging operation at Urmston Road for BPPS Pipeline	
1-26, 30, 31 May 2021		
1-12 Jun 2021		
5, 6, 8-18, 22-26 Jul 2021	Marine jetting operation at West Lamma Channel for LPS Pipeline	
8-16, 24-31 Aug 2021	Marine jetting operation at South of Shek Kwu Chau to West Lamma Channel for LPS Pipeline	
1-8, 12-14, 17-23 Sep 2021		
1-2 Oct 2021		
5-6 Nov 2021		
3-8, 24-25 Dec 2021		
8-19 (2), 23-26 Jan 2022		
26-31 Aug 2021	Marine dredging operation at Pipeline Shore Approach at BPPS for BPPS Pipeline	
1, 8, 9 Sep 2021		
18-30 Sep 2021	Marine jetting operation at West of Tai O to West of HKIA for BPPS Pipeline	
1-4, 18-31 Oct 2021		
1, 4-7, 10-16 Nov 2021		

Date	Active works activities	Monitoring results
3-8, 10-12, 17-19, 21-22 Dec 2021		
7-12 Mar 2022		
20, 24-28 Nov 2021	Marine jetting operation at Adamasta Channel for BPPS Pipeline	
23-31 Dec 2021		
3-7, 10-16 Dec 2021	Marine jetting operation at Southwest of Soko Islands for BPPS Pipeline	
1-4 Jan 2022		
23-31 Dec 2021	Marine jetting operation at Southwest Lantau for BPPS Pipeline	
13-18 Mar 2022		
4-9, 18-19, 22-23 April 2022		
13 – 15 July 2022		
24-31 Dec 2021	Marine jetting operation at West of HKIA to Lung Kwu Chau for BPPS Pipeline	
1-4, 7-12, 14-30 Jan 2022		
24-26 Mar 2022		
28-30 Jan 2022	Marine jetting operation at Double Berth Jetty to South of Shek Kwu Chau for LPS Pipeline	
4, 5, 9-14, 27, 28 Feb 2022		
1-6 Mar 2022		
16-30 Jan 2022	Marine jetting operation at Jetty Approach for BPPS Pipeline	
3, 6-10, 12-16, 18-24, 26, 28 Feb 2022		
1-14, 17-31 Mar 2022		
1, 10-12, 25-26, 29-30 April 2022		
1-16 May 2022		
9-15 Jan 2022	Marine jetting operation at South of Soko Islands for BPPS Pipeline	
4-5 Feb 2022		
1-17, 23-25 Feb 2022	Marine jetting operation at Lung Kwu Chau to Urmston Anchorage and Urmston Road for BPPS Pipeline	
26-28 Feb 2022	Marine jetting operation at West of BPPS for BPPS Pipeline	
1-22 Mar 2022		

Notes:
(1) Pre-trenching works was not undertaken on 27 January 2021 due to adverse weather and malfunction of the grab dredger.
(2) Only preparation works for marine jetting operation were conducted between 8 and 19 January 2022.

2.9 Records of Operating Speeds and Marine Travel Routes of Working Vessels

The operating speeds and marine travel routes of working vessels for construction of the Project were checked and reviewed. All the working vessels were operated at a speed lower than 10 knots when moving within the areas frequented by marine mammals, including the waters near Sha Chau and Lung Kwu Chau Marine Park, the waters at the west of Lantau Island and the waters between Soko Islands and Shek Kwu Chau, and followed the relevant marine travel requirements stipulated in the FEP. No non-compliance on the operating speeds and marine travel routes of working vessels was identified. Records of operating speeds and marine travel routes of working vessels for construction of the Project provided by the Contractor can be referred to the *relevant Annexes of the associated Monthly EM&A Reports*.

The compliance status on approval conditions given by the Director of Environmental Protection for the entry of working vessels (i.e. anchor handling tugs (AHTs)) within marine parks in pursuant to Condition 3.1 of FEP-01/558/2018/A for anchoring activities for construction of the Jetty, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B for anchoring activities for pipelaying and/or post-trenching processes for construction of LPS and BPPS Pipelines, respectively, was checked as appropriate. No non-compliance on the approval conditions was identified. Records of entry events of working vessels within the marine parks for construction of the Project provided by the Contractor can be referred to *relevant Annexes of the associated Monthly EM&A Reports*.

2.10 Implementation Status of Environmental Mitigation Measures

A summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in ***Annex C***. The necessary mitigation measures were implemented properly for the Project.

2.11 Summary of Exceedances of the Environmental Quality Performance Limit

There were no Project-related Action and Limit Level exceedances for marine water quality monitoring during the construction phase of the Project. There were no Project-related Action and Limit Level exceedances for the post-construction water quality monitoring of the Project.

There were no breaches of Action and Limit Levels for marine mammal monitoring during the construction phase of the Project.

Cumulative statistics on exceedance is provided in ***Annex E***.

2.12 Summary of Environmental Complaints, Notification of Summons and Successful Prosecutions

There were three environmental complaints received during the construction phase of the Project, including:

- **Environmental Complaints #1 & #2 on the absence of silt curtain for post-trenching operation of the LPS Pipeline** (referred by EPD on 20 and 21 January 2022; applicable for FEP-02/558/2018/A)**:** Upon investigation, no post-trenching operation was conducted for the LPS Pipeline in the past two weeks upon receipt of complaints (i.e. between 6 and 20 January 2022). Only survey works for confirming seabed profile in the vicinity of the LPS Pipeline were conducted, which did not result in any unacceptable environmental impacts to the surrounding and the works were in compliance with the environmental requirements under FEP-02/558/2018/A and the approved EIA report (Register No.: AEIAR-218/2018). The two complaints on silt curtain not deployed during post-trenching operation are thus considered invalid.
- **Environmental Complaint #3 on the alleged dumping of waste into sea between Shek Kwu Chau and Tai A Chau** (referred by EPD on 21 September 2022; applicable for FEP-01/558/2018/A, FEP-02/558/2018/A and FEP-03/558/2018/B)**:** Upon investigation, no construction & demolition (C&D) waste was generated from the Project in the past two weeks upon receipt of complaint (i.e. between 7 and 21 September 2022). There is no evidence showing any unacceptable waste management practice for the Project. Environmental protection / mitigation measures were observed to be implemented properly in accordance with the Implementation Schedule as well as the environmental requirements under the Further Environmental Permits and the approved EIA report (Register No.: AEIAR-218/2018). The complaint is thus considered invalid.

There were no notification of summons and successful prosecutions recorded during the construction phase of the Project.

Statistics on environmental complaints, notification of summons and successful prosecutions are summarised in ***Annex E***.

3. CONCLUSION AND RECOMMENDATIONS

The construction of the Project was completed on 27 June 2023. This Final EM&A Review Report presents the key findings of the EM&A works during the construction phase of the Project between 23 September 2020 and 27 June 2023 in accordance with the Updated EM&A Manual and the requirements of the Further Environmental Permits (FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B).

Environmental auditing works, including regular site inspections of construction works conducted by the ET, audit of implementation of Waste Management Plan, and review of the acceptability of operating speeds and marine travel routes of working vessels, including checking of compliance with the approval conditions given by EPD for allowing the entry of working vessels within marine parks in pursuant to Condition 3.1 of FEP-01/558/2018/A, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B, were conducted as appropriate. No non-compliance of environmental statutory requirements was identified.

Marine water quality monitoring for dredging and jetting operations as well as marine water quality monitoring for hydrotesting for the BPPS Pipeline and LPS Pipeline were conducted during the construction phase of the Project in accordance with the Updated EM&A Manual. No Project-related Action and Limit Level exceedances were recorded. Marine water quality monitoring data were reviewed with reference to the approved EIA Report. The results were generally in line with the EIA predictions. The monitoring methodology for marine water quality was reviewed and no change to monitoring methodology is recommended.

Pilot tests on the efficiency of silt curtain system (cage-type silt curtain for dredging / jetting operations and floating silt curtain for jetting operation) were conducted in accordance with the approved Silt Curtain Deployment Plans. The results of the pilot test have demonstrated that the tested silt curtain systems are capable of achieving an overall efficiency greater than those assumed in the approved EIA Report. As such, the proposed cage-type silt curtains and floating silt curtain are effective for the dredging / jetting operations for the Project to minimize water quality impacts and no further measures/recommendations are required. As similar floating silt curtain and jetting machine are used for the construction of the BPPS and LPS Pipelines, this pilot test results of floating silt curtain for jetting works are applicable for the subsea gas pipeline for BPPS under FEP-03/558/2018/B and the subsea gas pipeline for LPS under FEP-02/558/2018/A.

Marine mammal monitoring (vessel-based line transect survey and passive acoustic monitoring) was conducted during the construction phase in accordance with the Updated EM&A Manual. No breaches of Action and Limit Levels were recorded. Variation between the EIA study predictions and the EM&A monitoring results was not found.

There were three environmental complaints received during the construction phase of the Project, including:

- **Environmental Complaints #1 & #2 on the absence of silt curtain for post-trenching operation of the LPS Pipeline:** Upon investigation, no post-trenching operation was conducted for the LPS Pipeline in the past two weeks upon receipt of complaints (i.e. between 6 and 20 January 2022). Only survey works for confirming seabed profile in the vicinity of the LPS Pipeline were conducted, which did not result in any unacceptable environmental impacts to the surrounding and the works were in compliance with the environmental requirements under FEP-02/558/2018/A and the approved EIA report (Register No.: AEIAR-218/2018). The two complaints on silt curtain not deployed during post-trenching operation are thus considered invalid.
- **Environmental Complaint #3 on the alleged dumping of waste into sea between Shek Kwu Chau and Tai A Chau:** Upon investigation, no construction & demolition (C&D) waste was generated from the Project in the past two weeks upon receipt of complaint (i.e. between 7 and 21 September 2022). There is no evidence showing any unacceptable waste management

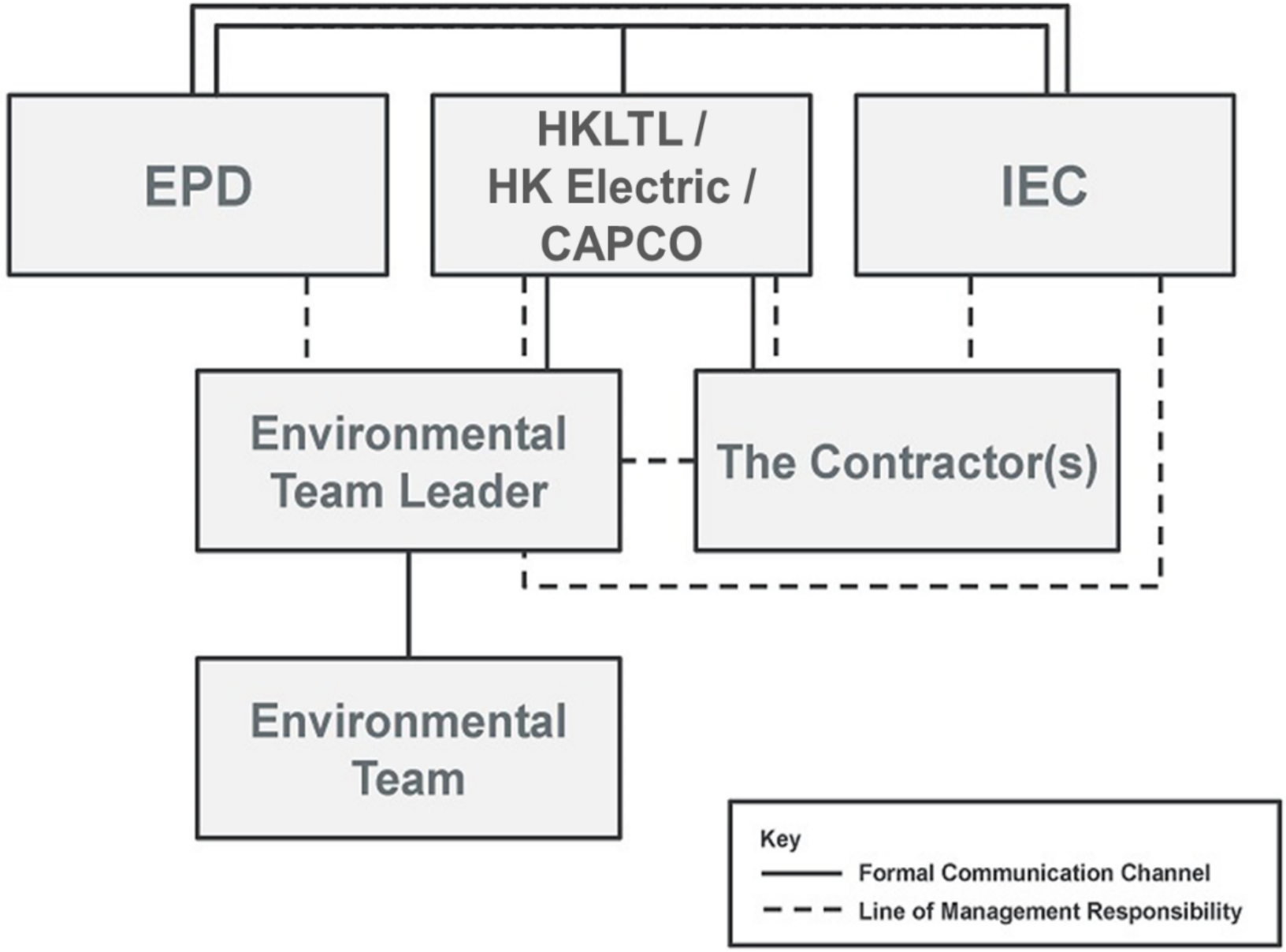
practice for the Project. Environmental protection / mitigation measures were observed to be implemented properly in accordance with the Implementation Schedule as well as the environmental requirements under the Further Environmental Permits and the approved EIA report (Register No.: AEIAR-218/2018). The complaint is thus considered invalid.

There were no notification of summons and successful prosecutions recorded during the construction phase of the Project.

The recommended environmental mitigation measures for the Project were effectively implemented and the EM&A programme undertaken by the ET has effectively monitored the construction activities as well as ensured proper implementation of mitigation measures. The monitoring and audit activities conducted during the construction phase have been reviewed and are considered effective. As such, no change to the monitoring methodology is recommended. Based on the EM&A findings for the construction phase, the environmental performance for the construction of the Project is generally in line with the EIA predictions and considered acceptable.

ANNEX A

PROJECT ORGANISATION



Annex A

Project Organisation

DATE: NOV 2020

Environmental Resources Management

ERM

ANNEX B

CONSTRUCTION PROGRAMME

Schedule of Works associated with the double berth jetty at LNG Terminal												
WORK	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Preparation Phase												
Pre-survey												
Construction Phase												
Jacket Installation												
Topsides Construction / Installation												
System commissioning and start up												
Schedule of Works for Jetty												

Annex B

Construction Programme for FEP-01/558/2018/A

DATE: JANUARY 2023

Environmental Resources Management

ERM

Schedule of the works associated with the subsea gas pipeline for Lamma Power Station (LPS)												
WORK	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Preparation Phase												
Pre-survey												
Removal of obstructions												
Construction Phase												
Pre-trenching including Deployment of Silt Curtain and Pilot Test												
De-burial of pre-installed pipeline by Mass Flow Excavator												
Pipeline Laying												
Intermediate Hydrotesting for Pipeline												
Post-trenching including Deployment of Silt Curtain and Pilot Test												
Rock Armour Placement												
Final Hydrotesting for Pipeline												
Gas Receiving Station (GRS) including pipe rack construction, preparation works at the vent header for tie-in of the new GRS, fencing, new gas receiving facility and new pipeline connection												
Gas Receiving Station (GRS) pre-commissioning, commissioning and start up												
Schedule of Works for LPS Pipeline												

Annex B

Construction Programme for FEP-02/558/2018/A

DATE: JANUARY 2023

Environmental Resources Management

ERM

Schedule of the works associated with the subsea gas pipeline for Black Point Power Station (BPPS) and the associated Gas Receiving Station (GRS) in BPPS												
WORK	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Preparation Phase												
Pre-survey												
Removal of obstructions												
Construction Phase												
Pre-trenching including Deployment of Silt Curtain and Pilot Test												
Cofferdam and Sheet Pile Construction												
Pipeline Laying												
Post-trenching including Deployment of Silt Curtain and Pilot Test												
Rock Armour Placement												
Intermediate and Final Hydrotesting for Pipeline												
Gas Receiving Station (GRS) including pipe rack construction, preparation works at the vent header for tie-in of the new GRS, fencing, new gas receiving facility and new pipeline connection												
Gas Receiving Station (GRS) pre-commissioning, commissioning and start up												
Schedule of Works for BPPS Pipeline and GRS												

Annex B

Construction Programme for FEP-03/558/2018/B

DATE: JANUARY 2023

Environmental Resources Management

ERM

ANNEX C

ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

TABLE C.1 IMPLEMENTATION SCHEDULE OF RECOMMENDED MITIGATION MEASURES

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [1]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Air Quality									
S4.10.1	S2.1	Impervious sheet will be provided for skip hoist for material transport.	Land sites for GRSs within BPPS and LPS / During construction, particularly dry season	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	The area where dusty work takes place should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after dusty activities as far as practicable.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	Observations were given for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	All dusty materials should be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS An observation was given for LPS Pipeline

[1] D = Design Phase; C = Construction Phase; O = Operational Phase

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S4.10.1	S2.1	Dropping heights for excavated materials should be controlled to a practical height to minimise the fugitive dust arising from unloading.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	During transportation by truck, materials should not be loaded to a level higher than the side and tail boards, and should be dampened or covered before transport.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	N/A
S4.10.1	S2.1	Wheel washing device should be provided at the exits of the work sites. Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty material from its body and wheels as far as practicable.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	Observations and reminders were given for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	Road sections between vehicle-wash areas and vehicular entrance will be paved.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	Haul roads will be kept clear of dusty materials and will be sprayed with water so as to	Land sites for GRSs within BPPS	Contractor(s)		✓		*Air Pollution Control*	An observation and a reminder

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		maintain the entire road surface wet at all times.	and LPS / During construction					*(Construction Dust) Regulation*	were given for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	Temporary stockpiles of dusty materials will be either covered entirely by impervious sheets or sprayed with water to maintain the entire surface wet all the time.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	Observations and reminder were given for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	Stockpiles of more than 20 bags of cement and dusty construction materials will be covered entirely by impervious sheeting sheltered on top and 3-sides.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	N/A
S4.10.1	S2.1	All exposed areas will be kept wet to minimise dust emission.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	Ultra-low-sulphur diesel (ULSD), defined as diesel fuel containing not more than 0.005% sulphur by	Land sites for GRSs within BPPS and LPS / During	Contractor(s) / CAPCO / HK Electric		✓	✓	*Environment, Transport and Works Bureau Technical Circular (ETWB-TC(W)) No*	✓ for GRS in BPPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [1]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		weight, will be used for all construction plant on-site.	construction/ During operation					*19/2005 on Environmental Management on Construction Sites*	N/A for GRS in LPS
S4.10.1	S2.1	The engine of the construction equipment during idling will be switched off.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS
S4.10.1	S2.1	Regular maintenance of construction equipment deployed on-site will be conducted to prevent black smoke emission.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*Air Pollution Control (Construction Dust) Regulation*	✓ for GRS in BPPS N/A for GRS in LPS A reminder was given for marine-based works for LPS Pipeline Observations were given for BPPS Pipeline, LPS Pipeline and LNG Terminal
S4.10.1	S2.1	All marine vessels fuelled in Hong Kong are required to operate	Marine sites for the LNG Terminal, the BPPS Pipeline and	Contractor(s) / Project Proponents		✓	✓	*Air Pollution Control (Marine*	✓ for BPPS Pipeline, LPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [(1)]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		using marine light diesel with sulphur content lower than 0.05%.	the LPS Pipeline / During construction/ During operation					*Light Diesel) Regulation*	Pipeline and LNG Terminal
S4.10.1	S2.1	Non-road mobile machinery (NRMMs), e.g. mobile generator and air compressor, shall comply with the prescribed emission standards and approved with a proper label by EPD.	Land sites for GRSs within BPPS and LPS and marine sites for the LNG Terminal, the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		*Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation*	Observations were given for GRS in BPPS ✓ for BPPS Pipeline N/A for GRS in LPS, LNG Terminal and LPS Pipeline
S4.10.1	S2.1	To ensure proper implementation of the recommended dust mitigation measures and good construction site practices during the construction phase of the GRSs and the BPPS and the LPS, environmental site audits on monthly basis is recommended throughout the construction period.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		-	✓ for GRS in BPPS ✓ for GRS in LPS
S4.10.2	S2.2	LNGCs shall comply with the fuel restriction requirement under the *Air Pollution Control (Ocean*	Marine site for the LNG Terminal / During operation	HKLTL			✓	*Air Pollution Control (Ocean Going Vessels)*	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		Going Vessels) (Fuel at berth) Regulation.						*(Fuel at berth) Regulation*	
Hazard to Life									
S5.3.3	S3	All personnel within the BPPS shall comply with CLP safety policy and requirements.	Land site for the GRS within BPPS / During construction / During operation	Contractor(s) / CAPCO		✓	✓	-	✓
S5.3.3	S3	All personnel within the LPS shall comply with HK Electric safety policy and requirements.	Land site for the GRS within LPS / During construction / During operation	Contractor(s) / HK Electric		✓	✓	-	N/A
S5.3.3	S3	All operation work procedures shall be complied with the operating plant procedures or guidelines and regulatory requirements.	Land sites for GRSs within BPPS and LPS / During construction / During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	✓ for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	All personnel shall be equipped with appropriate personal protective equipment (PPE) when working at the BPPS and LPS facilities.	Land sites for GRSs within BPPS and LPS / During construction / During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	✓ for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Safety training and briefings shall be provided to all personnel.	Land sites for GRSs within BPPS and LPS / During	Contractor(s) / CAPCO / HK Electric		✓	✓	-	✓ for GRS in BPPS ✓ for GRS in LPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
			construction / During operation						
S5.3.3	S3	Regular site safety inspections/ audits shall be conducted.	Land sites for GRSs within BPPS and LPS / During construction/ During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	✓ for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Method statements and risk assessments shall be prepared and safety control measures shall be in place before commencement of work.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Work permit system, on-site pre-work risk assessment and emergency response procedure shall be in place before commencement of work.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	All construction workers shall be under close site supervision during the construction phase of the GRSs.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS ✓ for GRS in LPS
S5.4.1	S3	An emergency response plan will be put in place which fully documents the procedures to be	Transit of the LNGC and FSRU Vessel under Emergency	HKLTL			✓	-	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		followed in the event of an emergency.	Situation / During operation						
S5.3.3	S3	Method statements and risk assessments shall be prepared and safety control measures should be in place before the commencement of construction works.	LNG Terminal / During construction	Contractor(s)		✓		-	✓
S5.3.3	S3	Work permit system, on-site pre-work risk assessment and emergency response procedure shall be in place before commencement of construction works.	LNG Terminal / During construction	Contractor(s)		✓		-	✓
S5.3.3	S3	All construction workers shall be under close site supervision during the construction phase of the LNG Terminal.	LNG Terminal / During construction	Contractor(s)		✓		-	✓
S5.3.3	S3	All personnel within the LNG Terminal shall comply with relevant safety policy and requirements.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	All operation work procedures shall be complied with relevant codes and standards (e.g.	LNG Terminal / During operation	HKLTL			✓	-	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		SIGTTO) and regulatory requirements.							
S5.3.3	S3	Work permit system and emergency response procedure shall be in place.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Robust and extended process control system, safety control system, fire-fighting system and security system shall be provided.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Sufficient and trained / competent staff shall be provided to operate the LNG Terminal.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Regular safety inspections/audits shall be conducted.	LNG Terminal / During operation	HKLTL			✓	-	N/A
Noise									
S6.7	S4	N/A							N/A
Water Quality									
S7.9.1	S5	A detailed hydrotesting procedure for subsea pipelines will be developed that will detail how the process will be carried out, how it will be carefully controlled and monitored, and how the intake	LNG Terminal / During construction	Contractor(s)		✓		TM Standard under the *WPCO*, *WPCO* license requirements, WQO	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		and subsequent discharge of the seawater will be managed. Water quality monitoring for commissioning hydrotest for the subsea pipelines is presented in Section 5.3.5 of the Updated EM&A Manual.							
S7.9.1	S5	Adoption of appropriate dredging and jetting rates, plant numbers and silt curtains at the plant and WSRs, where applicable (***Table 7.18*** of the EIA Report, reprovided as ***Table A.2*** below).	Marine Dredging & Jetting for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	✓ for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	Grab dredging can be conducted concurrently with one TSHD.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	One jetting machine will be working on each pipeline. No more than two jetting machines will be working on BPPS pipeline.	Marine Jetting for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	✓ for LPS Pipeline and BPPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S7.9.1	S5	Cofferdam construction and removal at landfalls of BPPS and LPS (where required) should not be conducted concurrently with the nearby pipeline dredging sections (BPPS KP44.9 - 45.0 and LPS KP17.4-18.2). Silt curtain surrounding the works areas for cofferdam construction and removal at pipeline landfalls of the BPPS and the LPS should also be implemented.	Pipeline landfalls for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	A reminder was given for BPPS Pipeline N/A for LPS Pipeline
S7.9.1/ S7.9.2	S5	The following measures shall be followed for provision of silt curtain: • The silt curtain shall be formed and installed in such a way that tidal rise and fall are accommodated, with the silt curtains always extending from the surface to the bottom of the water column and held with anchor blocks. • Schematic diagrams on silt curtain deployment are provided in ***Figures 7.4*** and ***7.5*** of the EIA Report. • The contractor shall regularly inspect the silt curtains and check that they are moored and	Marine Dredging & Jetting for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s)		✓	✓	-	✓ for 1st, 2nd, 3rd and 5th bullet points for BPPS Pipeline Observation and reminders on the 4th bullet point was given for BPPS Pipeline ✓ for LPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		marked to avoid danger to marine traffic. • Regular inspection on the integrity of the silt curtain should be carried out by the contractor and any damage to the silt curtain shall be repaired by the contractor promptly. • Relevant marine works shall only be undertaken when the repair is fixed to the satisfaction of the engineer.							
S7.9.1 / S7.9.2	S5	All vessels should be well maintained and inspected before use to limit any potential discharges to the marine environment.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s)		✓	✓	-	✓ for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	All vessels must have a clean ballast system.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	✓ for BPPS Pipeline and LPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S7.9.1 / S7.9.2	S5	No overflow is permitted from the trailing suction hopper dredger and the Lean Mixture Overboard (LMOB) system will only be in operation at the beginning and end of the dredging cycle when the drag head is being lowered and raised.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s)		✓	✓	-	✓ for BPPS Pipeline and LPS Pipeline
S7.9.1 / S7.9.2	S5	Dredged marine mud will be disposed of in a gazetted marine disposal area in accordance with the Dumping at Sea Ordinance (DASO) permit conditions.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s)		✓	✓	-	✓ for BPPS Pipeline and LPS Pipeline
S7.9.1 / S7.9.2	S5	Dredgers will maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operations speed to ensure that excessive turbidity is not generated by turbulence from	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓	✓	-	A reminder was given for LPS Pipeline ✓ for BPPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		vessel movement or propeller wash.	Marine Maintenance Dredging (LNG Terminal) / During operation						
S7.9.1 / S7.9.2	S5	Marine works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. Wastewater from potentially contaminated area on working vessels should be minimised and collected. These kinds of wastewater should be brought back to port and discharged at appropriate collection and treatment system.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction / During operation	Contractor(s)		✓	✓	-	An observation was given for BPPS Pipeline ✓ for LPS Pipeline
S7.9.1 / S7.9.2	S5	No solid waste is allowed to be disposed overboard.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction / During operation	Contractor(s)		✓	✓	-	✓ for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	Appropriate infiltration control, such as cofferdam wall, should be adopted to limit groundwater inflow to the excavation works areas in the Project site. Groundwater pumped out from	Land sites & drainages for GRSs within BPPS and	Contractor(s)		✓		-	A reminder was given for GRS in BPPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		excavation area should be discharged into the storm system via silt removal facilities.	LPS / During construction						N/A for GRS in LPS
S7.9.1	S5	Silt removal facilities such as silt traps or sedimentation facilities will be provided to remove silt particles from runoff to meet the requirements of the TM standard under the WPCO. The design of silt removal facilities will be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit will be removed regularly.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*ProPECC PN 1/94*, TM Standard under the *WPCO*	Observations were given for GRS in BPPS N/A for GRS in LPS
S7.9.1	S5	Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S7.9.1	S5	Appropriate surface drainage will be designed and provided where necessary.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS N/A for GRS in LPS
S 7.9.1	S5	The precautions to be taken at any time of year when rainstorms are likely together with the actions to be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		*ProPECC PN 1/94*	A reminder was given for GRS in BPPS N/A for GRS in LPS
S7.9.1	S5	Oil interceptors will be provided in the drainage system where necessary and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS N/A for GRS in LPS
S7.9.1	S5	Temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge, if any, will be adequately designed for the controlled release of storm flows.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS N/A for GRS in LPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S7.9.1	S5	The temporary diverted drainage, if any, will be reinstated to the original condition when the construction work has finished or when the temporary diversion is no longer required.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A
S7.9.1	S5	Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. No onsite discharge from these chemical toilets would be allowed.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS ✓ for GRS in LPS
S 7.9.2	S5	Mitigation measures for maintenance dredging at the LNG Terminal in form of controlled dredging rate (maximum of 5,500m^3 day^{-1}) as well as silt curtain should be implemented for the control of sediment dispersion and the protection of the nearby WSRs.	Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s) / HKLTL			✓	-	N/A
S 7.9.2 / S9.11.3	S5 / S7	A project-specific contingency plan (including protocols for avoidance, containment, remediation and reporting	Fuel spillage for the LNG Terminal / During operation	Contractor(s) / HKLTL			✓		N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		accidental fuel spill event) will be prepared and implemented to contain and clean up the spilled or leaked fuels or chemicals at the LNG Terminal, surrounding waters and marine parks.							
S7.12.1	S5.2-S5.5	Marine water quality monitoring at selected WSRs is recommended for marine dredging and jetting works for the pipeline construction.	Designated monitoring stations as defined in EM&A Manual / During marine construction period	Environmental Team (ET)		✓		-	✓
S7.12.1	S5.2-S5.5	To ensure proper implementation of the recommended mitigation measures and good construction site practices during marine-based construction works, environmental site audits on a regular basis is recommended throughout the construction period.	Marine sites for the LNG Terminal, the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		-	✓ for BPPS Pipeline, LPS Pipeline and LNG Terminal
S7.12.2	S5.2-S5.5	Water quality monitoring at the selected nearby WSRs is recommended for first year of operation of the LNG Terminal.	During operation for the LNG Terminal	Environmental Team (ET)/ HKLTL			✓	TM Standard under the *WPCO*, *WPCO* license requirements, WQO	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S7.12.2	S5.2-S5.5	During maintenance dredging at the LNG Terminal, water quality monitoring at the selected nearby WSRs would be required.	Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s) / HKLTL			✓	TM Standard under the *WPCO*, *WPCO* license requirements, WQO	N/A
Waste Management									
S8.5	S6.2	The contractor(s) will nominate approved personnel to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S8.5	S6.2	Good waste management practices should be implemented: • Training of site personnel in proper waste management and chemical handling procedures; • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre; • Encourage collection of aluminium cans and waste paper by individual collectors during construction with	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓ for 1st, 3rd, 5th, 6th & 7th bullet points for GRS in BPPS ✓ for 1st, 3rd, 6th & 7th bullet points for GRS in LPS ✓ for 1st, 2nd, 3rd, 5th, 6th & 7th bullet points for BPPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		separate labelled bins provided to segregate these wastes from other general refuse by the workforce; • Any unused chemicals, and those with remaining functional capacity, be recycled as far as possible; • Prior to disposal of C&D materials, wood, steel and other metals will be separated, to the extent practical for re-use and/or recycling to reduce the quantity of waste to be disposed in a landfill; • Proper storage and site practices to reduce the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to reduce amount of waste generated and avoid unnecessary generation of waste.							✓ for 1st bullet point for LPS Pipeline ✓ for 1st, 2nd, 3rd, 5th, 6th & 7th bullet points for LNG Terminal N/A for 2nd & 4th bullet points for GRS in BPPS N/A for 2nd, 4th & 5th bullet points for GRS in LPS N/A for 4th bullet point for BPPS Pipeline and LNG Terminal N/A for 2nd to 7th bullet points for LPS Pipeline Observation and reminder were given for GRS in BPPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S8.5	Table 6.1	The contractor(s) must provide sufficient waste disposal points. Wastes will be collected and removed from site in a timely manner.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	Observation and reminder were given for GRS in BPPS
S8.5	Table 6.1	The contractor(s) will have appropriate measures to reduce windblown/ floating litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	N/A
S8.5	Table 6.1	The contractor(s) will take and keep records of quantities of wastes generated, recycled and disposed of and the disposal sites.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S8.5	Table 6.1	The contractor(s) must segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse and recycling of material and proper disposal of waste.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	A reminder was given for BPPS Pipeline ✓ for GRS in BPPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
									N/A for GRS in LPS, LPS Pipeline and LNG Terminal
S8.5	S6.2	The contractor(s) will use reusable non-timber formwork to reduce the amount of C&D materials.	All areas / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS N/A for GRS in LPS, BPPS Pipeline, LPS Pipeline and LNG Terminal
S8.5	Table 6.1	The contractor(s) must ensure that all the necessary waste disposal and marine dumping permits or licences are obtained prior to the commencement of the construction works.	During construction	Contractor(s)		✓		-	✓
S8.5	S6.2	The contractor will open a billing account with EPD in accordance with the *Waste Disposal (Charges for Disposal of Construction Waste) Regulation* for the payment of disposal charges.	During construction	Contractor(s)		✓		*Cap 354N Waste Disposal (Charges for Disposal of Construction Waste) Regulation*	✓
S8.5	S6.2	A trip-ticket system will be established in accordance with *DEVB TC(W) No. 6/2010* to monitor the reuse of surplus	During construction	Contractor(s)		✓		*DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of*	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		excavated materials off-site and disposal of construction waste and general refuse at transfer facilities/ landfills, and to control fly-tipping.						*Construction & Demolition Materials*	
S8.5	S6.2	A WMP as stated in the *PNAP ADV-19* for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established and implemented during the construction phase as part of the Environmental Management Plan (EMP). The Contractor will be required to prepare the EMP and submits it to the Architect/ Engineer under the Contract for approval prior to implementation.	All areas / During construction	Contractor(s)		✓		*PNAP ADV-19*	✓
S8.5	Table 6.1	The management of dredged marine sediment requirement from *PNAP ADV-21* will be incorporated in the Contract for the construction and maintenance dredging during the operation of the Project.	Marine works / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	*PNAP ADV-21* and *Dumping at Sea Ordinance (DASO)*	✓
S8.5/ S7.9	S6.2 / S5	Disposal vessels will be fitted with tight bottom seals in order to	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓		*Dumping at Sea Ordinance (DASO)*	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		prevent leakage of material during transport.							
S8.5/ S7.9	S6.2 / S5	Barges will be filled to a level, which ensures that of marine sediment and marine sediment laden water does not spill over during loading or transport to the disposal site and that adequate freeboard is maintained to ensure that the decks are not washed by wave action.	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓		*Dumping at Sea Ordinance (DASO)*	Observations were given for BPPS Pipeline A reminder was given for LPS Pipeline
S8.5/ S7.9	S6.2 / S5	After dredging, any excess materials will be cleaned from decks and exposed fittings before the vessel is moved from the dredging area.	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓		*Dumping at Sea Ordinance (DASO)*	Observations were given for BPPS Pipeline A reminder was given for LPS Pipeline
S8.5/ S7.9	S6.2 / S5	When the dredged material has been unloaded at the disposal areas, any material that has accumulated on the deck or other exposed parts of the vessel will be removed and placed in the hold or a hopper. Under no circumstances will decks be washed clean in a way that	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓			Observations were given for BPPS Pipeline A reminder was given for LPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		permits material to be released overboard.							
S8.5	S6.2	Dredgers will maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operations speed to ensure that excessive turbidity is not generated by turbulence from vessel movement or propeller wash.	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓			✓
S8.5	Table 6.1	C&D materials will be segregated on-site into public fill and non-inert C&D materials and stored in different containers or skips to facilitate reuse of the public fill and proper disposal of the construction waste. Specific areas of the land and marine-based construction sites will be designated for such segregation and storage if immediate use is not practicable. Prefabrication will be adopted as far as practicable to reduce the construction waste arisings.	During construction	Contractor(s)		✓		-	✓
S8.5	Table 6.1	The contractor(s) will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the *Code of Practice on the*	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	*Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the*	Reminder and observations were

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		Packaging, Labelling and Storage of Chemical Wastes.						*Packaging, Labelling and Storage of Chemical Wastes*	given for GRS in BPPS ✓ for BPPS Pipeline, LPS Pipeline, GRS in LPS and LNG Terminal
S8.5	Table 6.1	Containers used for storage of chemical wastes will: • Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; • Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	*Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*	✓
S8.5	Table 6.1	The storage area for chemical wastes will:	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	*Waste Disposal (Chemical Waste) (General) Regulation; Code*	✓ for 1st, 2nd, 4th, 5th & 6th bullet

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		• Be clearly labelled and used solely for the storage of chemical waste; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and • Be arranged so that incompatible materials are appropriately separated.						*of Practice on the Packaging, Labelling and Storage of Chemical Wastes*	points for BPPS Pipeline ✓ for 1st bullet point for LPS Pipeline ✓ for 1st, 2nd, 4th, 5th & 6th bullet points for GRS in BPPS An observation was given for 3rd bullet point for BPPS Pipeline An observation was given for 3rd bullet point for LPS Pipeline Reminder and observations were given for 3rd bullet point for GRS in BPPS N/A for 2nd, 4th to 6th bullet points for LPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [(1)]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
									N/A for LNG Terminal
S8.5	Table 6.1	Chemical waste will be disposed of: • Via a licensed waste collector; and • To a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	*Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*	N/A
S8.5	Table 6.1	General refuse (including the floating refuse collected) will be stored in enclosed bins separately from C&D materials and chemical wastes. Floating refuse will be collected on an 'as needed' basis for disposal as general refuse. Workers will be prohibited from throwing rubbish into the sea and adequate bins will be provided on both land and marine-based sites and marine vessels. General refuse will be delivered separately from C&D materials and chemical	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓ A reminder and an observation were given for GRS in BPPS Reminders were given for BPPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		wastes for offsite disposal on a regular basis to reduce odour, pest and litter impacts. General refuse from the marine vessels will be collected and disposed on shore.							
S8.5	Table 6.1	Recycling bins will be provided at strategic locations within the land and marine-based construction site and marine vessels to facilitate recovery of recyclable materials (including aluminium can, waste paper, glass bottles and plastic bottles) from the Project Site. Materials recovered will be sold for recycling.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	An observation was given for GRS in BPPS A reminder was given for BPPS Pipeline N/A for LPS Pipeline and LNG Terminal N/A for material recovered being sold for recycling
S8.5	S6.2	To avoid any odour and litter impact, appropriate number of portable toilets will be provided for workers on-site.	All areas / During construction / During operation	Contractor(s)		✓	✓	-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S8.5	S6.2	At the commencement of the construction works and operations, training will be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling. In particular, the training will emphasize no dumping of waste into the sea is allowed, particularly at marine-based work sites and on marine vessels.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S8.5	S6.2	Industrial waste arising from maintenance activities will be segregated. Scrap metals and recyclables will be sent for recycling to reduce the overall quantity of waste disposed from these activities.	All areas / During operation	Project Proponents			✓	-	N/A
S8.7	S6.1	It is recommended that monthly audits of the waste management practices be carried out during the construction phase land-based work sites (at the GRSs at the BPPS and the LPS), and at marine-based work sites (on marine vessels and Jetty) to determine if wastes are being	All areas / During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [1]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		managed in accordance with the recommended good site practices and WMP. The audits will include all aspects of waste management including waste generation, storage, handling, recycling, transportation and disposal, to prevent any dumping of waste into the sea or malpractice of waste disposal.							
Ecology									
S9.11.2	S7	The vessel operators will be required to control and manage all effluent from vessels. These kinds of wastewater shall be brought back to port where possible and discharged at appropriate collection and treatment system to prevent avoidable water quality impact.	Marine works / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S9.11.2	S7	A policy of no dumping of rubbish, food, oil, or chemicals will be strictly enforced. This will also be covered in the contractor briefings.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S9.11.2	S7	Only well-maintained and inspected vessels would be used to limit any potential discharges to the marine environment.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S9.11.2	S7	Standard site practices outlined in *ProPECC PN 1/94 "Construction Site Drainage"* will be followed as far as practicable in order to reduce surface runoff, minimise erosion, and also to retain and reduce any SS prior to discharge.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	*ProPECC PN 1/94*	✓
S9.11.3	S7	Pipeline dredging/ jetting works between North of Tai O and Fan Lau (BPPS KP21.3 to 15.6) will avoid the peak months of Chinese White Dolphin (CWD) calving (May and June).	Marine works (Dredging/ jetting works between North of Tai O and Fan Lau along the BPPS Pipeline) / During construction	Contractor(s)		✓		-	✓
S9.11.3	S7	Pipeline dredging/ jetting works between South of Soko Islands and the LNG Terminal (BPPS KP8.9 to 0.0) will be restricted to a daily maximum of 12 hours with daylight (0700 – 1900) operations.	Marine works (Dredging/ jetting works between South of Soko Islands and the LNG Terminal along the BPPS Pipeline) / During construction	Contractor(s)		✓		-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S9.11.3	S7	Pipeline dredging/ jetting from LNG Terminal to South of Shek Kwu Chau (LPS KP0.0 to 5.0) will be restricted to a daily maximum of 12 hours with daytime (0700 – 1900) operations.	Marine works (Dredging/ jetting works between from LNG Terminal to South of Shek Kwu Chau along the LPS Pipeline) / During construction	Contractor(s)		✓		-	✓
S9.11.3	S7	Use of vibratory/ hydraulic pushing method to vibrate / push the open-ended steel tubular pile for the upper layer of the seabed and only use hydraulic hammer (if needed) to install the remainder of the pile length through the lower layer of the seabed. During underwater percussive piling works: • Quieter hydraulic hammers should be used instead of the noisier diesel hammers; • Use of Noise Reduction System for hydraulic hammering; • Acoustic decoupling of noisy equipment on work barges should be undertaken; • Using ramp-up piling procedures. This comprises	Marine works (Piling at the LNG Terminal) / During construction	Contractor(s)		✓		-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		of low energy driving for a period of time prior to commencement of full piling. This will promote avoidance of the area by marine mammals when sounds levels are not injurious. Blow frequency during this ramping up period should replicate the intensity that would be undertaken during full piling (e.g. one blow every two seconds) to provide cues for marine mammals to localize the sound source. Pile blow energy should be ramped up gradually over the 'soft start' period. Activities will be continuous without short-breaks and avoiding sudden random loud sound emissions; • Underwater percussive piling should be conducted inside a bubble curtain so as to ameliorate underwater sound level transmission; • The percussive pile driving will be conducted during the daytime (0700 – 1900) for a maximum of 12 hours,							

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		avoiding generation of underwater sounds at night time; and • Underwater percussive piling works for the Jetty construction will avoid the peak season of FP (December to May).							
S9.11.3	S7	The vessel operators of this Project will be required to use predefined and regular routes (that do not encroach into existing and proposed marine parks), make use of designated fairways to access the works areas, and would avoid traversing sensitive habitats such as existing and proposed marine parks (with the exception of the FSRU Vessel which will need to transit through the proposed SLMP during manoeuvring to the Jetty and after typhoon event due to its safe operational requirement).	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S9.11.3	S7	Any anchoring/ anchor spread requirements during Project construction will avoid encroachment into the existing and proposed marine parks, unless otherwise agreed by the	Marine works (on existing, planned and potential marine parks) / During construction	Contractor(s)/ Project Proponents		✓		-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		Director of Environmental Protection.							
S9.11.3	S7	Silt curtain deployment during Project construction and maintenance dredging will avoid encroachment into the existing and proposed marine parks, unless otherwise agreed by the Director of Environmental Protection.	Marine works (on existing, planned and potential marine parks) / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S9.11.3	S7	No stopping over or anchoring activity of vessels related to the Project should be conducted within existing and proposed marine parks, even before, during and after typhoon, unless otherwise agreed by the Director of Environmental Protection.	Marine works (on existing, planned and potential marine parks) / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S9.11.3	S7	Use of appropriate dredging and jetting rates with the use of silt curtain where needed as recommended in the Water Quality section (***Section 7*** of the EIA Report) to reduce potential water quality impacts from elevated suspended solids (SS)	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		due to the proposed marine works.							
S9.11.3	S7	Silt curtain will be checked and maintained to ensure its effectiveness in mitigating water quality impacts on existing, planned and potential marine parks.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	An observation was given for BPPS Pipeline
S9.11.3	S7	All vessel operators working on the Project will be given a briefing, alerting them to the locations of the existing, proposed and potential marine parks and the regulations for marine parks, the possible presence of dolphins and porpoises in the marine works areas, and the guidelines for safe vessel operation in the presence of cetaceans. The vessels will avoid using high speed as far as possible. By observing the guidelines, vessels will be operated in an appropriate manner so that marine mammals will not be subject to undue disturbance or harassment.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S9.11.3	S7	All vessels used in this Project will be required to slow down to 10 knots around the Project's marine works areas and areas with high dolphin and porpoise usage, including existing and proposed marine parks. With implementation of this measure, the chance of vessel strike resulting in physical injury or mortality of marine mammals will be extremely unlikely.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S9.11.3	S7	During underwater percussive piling works, a marine mammal exclusion zone within a radius of 500m radius will be implemented during underwater percussive piling works. Qualified observer(s) will scan an exclusion zone of 500m radius around the work area for at least 30 minutes prior to the start of piling. If a marine mammal is observed in the exclusion zone, piling will be delayed until they have left the area. This measure will ensure the area in the vicinity of the underwater percussive piling work is clear of marine mammals prior to the commencement of works and will serve to reduce any disturbance	Marine works / During construction	Contractor(s) / Project Proponents		✓		-	✓

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		to marine mammals. When a marine mammal is spotted by qualified personnel within the exclusion zone, piling works will cease and will not resume until the observer confirms that the zone has been continuously clear of the marine mammal for a period of 30 minutes. This measure will ensure the area in the vicinity of the piling is clear of the marine mammal during works and will serve to reduce any disturbance to marine mammals.							
S9.11.3	S7	During marine dredging or jetting operations, a marine mammal exclusion zone within a radius of 250m from dredger or jetting machine will be implemented. Qualified observer(s) will scan an exclusion zone of 250m radius around the work area for at least 30 minutes prior to the start of dredging or jetting. If cetaceans or other megafauna are observed in the exclusion zone, dredging or jetting will be delayed until they have left the area. This measure will ensure the area in the vicinity of the dredging or jetting work is clear of marine mammals prior to	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓ A reminder was given for BPPS Pipeline

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		the commencement of works and will serve to reduce any disturbance to marine mammals. When a marine mammal is spotted by qualified personnel within the exclusion zone, dredging or jetting works will cease and will not resume until the observer confirms that the zone has been continuously clear of the marine mammal for a period of 30 minutes. This measure will ensure the area in the vicinity of the works is clear of the marine mammal during works and will serve to reduce any disturbance to marine mammals. If necessary, for night-time works, exclusion zone monitoring for FP by underwater acoustic means would be explored to supplement the exclusion zone monitoring by trained observers. A site trial will be conducted to demonstrate its practicability/ effectiveness before actual implementation during the night-time works.							
S9.11.3	S7	Implementation of a contingency plan to contain and clean up the spilled or leaked fuels or chemicals at the LNG Terminal,	Marine site for the LNG Terminal / During operation	Contractor(s) / HKLTL			✓	-	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage (1)			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		surrounding waters and marine parks.							
S9.15.1	S7	Baseline, impact and post-construction monitoring of marine mammal using vessel-based line transect surveys and passive acoustic monitoring (PAM) will be undertaken to keep track of potential changes in the usage of waters in the vicinity of the Project's works areas by FP. Prior to the commencement of monitoring, methods will be agreed with the AFCD.	Marine site / During construction	Contractor(s) / ET/ Project Proponents		✓		-	✓
Fisheries									
S10.8	S8	The mitigation measures designed to mitigate impacts to water quality to acceptable levels (compliance with assessment criteria) and marine ecological impacts are expected to mitigate impacts to fisheries resources.	During construction and operation	Contractor(s) / Project Proponents / Environmental Team (ET) & Independent Environmental Checker (IEC)		✓	✓	-	✓
S10.8	S8	Impingement and entrainment of fisheries resources will be reduced through appropriate design of the intake screens on the cooling water intake.	During operation for the LNG Terminal	Contractor(s) / HKLTL			✓	-	N/A

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [1]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Visual									
S11.8	S9	Sensitive architectural design of the new facilities. This should take into account material texture, colour, finished to structure and the context of the site to ensure the GRSs at the BPPS and LPS blend into the existing context, cause least disturbance to the existing land. LNG Terminal will be designed for marine safety and operations, in accordance with relevant standards and regulations and sensitive architectural design will be considered where practicable.	All areas / Detailed design / During construction / During operation	Design Contractor / Project Proponents	✓	✓	✓	-	✓
S11.8	S9	Pre-construction and construction period for the GRSs and LNG Terminal should be reduced as far as practical to lower visual impact.	All areas / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS, GRS in LPS and LNG Terminal
S11.8	S9	Following construction, land areas temporarily affected by the construction works, will be reinstated to their former state.	Land sites for the GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS N/A for GRS in LPS

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage [1]			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S11.8	S9	Light intensity and beam directional angle should be controlled at the GRSs and the LNG Terminal at the design stage to reduce light pollution and glare (e.g. hooded lights, specific directional focus, etc.).	All areas / Detailed design / During operation	Design Contractor / Project Proponents	✓		✓	-	N/A
S11.8	S9	Any plants to be affected by the GRSs at the BPPS and the LPS should be preserved and care taken to ensure the existing health status of the vegetation is maintained or enhanced after construction.	All areas / During construction	Contractor(s)		✓		-	✓ for GRS in BPPS N/A for GRS in LPS
Cultural Heritage									
S12.7	S10	N/A							N/A

TABLE C.2 SUMMARY OF MITIGATION MEASURES FOR PIPELINE CONSTRUCTION WORKS

Work Location	Plants Involved	Allowed Maximum Work Rate	Silt Curtain at Plants	Silt Curtain at Water Sensitive Receivers	Other Measures	Implementation Status
LPS Pipeline (under FEP-02/558/2018/A)						
Pipeline shore approach at LPS (KP17.4 - 18.2)	1 Grab Dredger	1,600m^3 day^{-1} for 24 hours each day	Yes	Not required		N/A
West Lamma Channel (KP14.5 - 17.4)	1 Jetting Machine	1,000m day^{-1} for 24 hours each day	Yes	Not required		✓
South of Shek Kwu Chau to West Lamma Channel (KP5.0 - 14.5)	1 Jetting Machine	7,000m day^{-1} for 24 hours each day	Yes	Not required		✓
Double Berth Jetty to South of Shek Kwu Chau (KP0.1 - 5.0)	1 Jetting Machine	720m day^{-1} for 24 hours each day	Yes	Two layers at Eastern Boundary of the Proposed South Lantau Marine Park (KP0.1 - 5.0)	Daily maximum of 12 hours with daylight (0700 – 1900)	✓
Pipeline Riser Sections at Double Berth Jetty (under FEP-02/558/2018/A and FEP-03/558/2018/B)						
Pipeline Riser (KP0.0 - 0.1 for both pipelines)	1 Grab Dredger	8,000m^3 day^{-1} for 24 hours each day	Yes	Not required	Daily maximum of 12 hours with daylight (0700 – 1900)	✓ for FEP-02/558/2018/A N/A for FEP-03/558/2018/B
BPPS Pipeline (under FEP-03/558/2018/B)						
Jetty Approach (KP0.1 - 5.0), excluding Subsea Cable Sterile Corridors	1 Jetting Machine (Note 1)	1,000m day^{-1} for 24 hours each day	Yes	Not required for grab dredging; Two layers at Southern Boundary of the Proposed South Lantau Marine Park (KP0.1 - 8.9) for jetting	Daily maximum of 12 hours with daylight (0700 – 1900)	✓
Subsea Cable Sterile Corridors (KP1.49 - 2.75 & KP3.55 - 4.43)	2 Grab Dredgers, followed by 1 Jetting Machine	8,000m^3 day^{-1} for 24 hours each day for each dredger 720m day^{-1} for 24 hours each day jetting machine	Yes			✓

Work Location	Plants Involved	Allowed Maximum Work Rate	Silt Curtain at Plants	Silt Curtain at Water Sensitive Receivers	Other Measures	Implementation Status
South of Soko Islands (KP5.0 - 8.9)	1 Jetting Machine (Note 1)	1,000m day^{-1} for 24 hours each day	Yes			✓
Southwest of Soko Islands (KP8.9 - 12.1)	1 Jetting Machine (Note 1)	1,000m day^{-1} for 24 hours each day	Yes	Not required		✓
Adamasta Channel (KP12.1 - 15.6)	1 Jetting Machine (Note 1)	1,000m day^{-1} for 24 hours each day	Yes	Not required		✓
Southwest Lantau (KP15.6 - 21.3)	1 Jetting Machine (Note 1)	1,500 m day^{-1} for 24 hours each day	Yes	Not required	Avoid the peak months of Chinese White Dolphin (CWD) calving (May and June)	✓
West of Tai O to West of HKIA (KP21.3 - 31.5)	1 Jetting Machine (Note 1)	1,500m day^{-1} for 24 hours each day from KP KP26.2 to 21.3 720m day^{-1} for 24 hours each day from KP31.5 to 26.2	Yes	Not required		✓
Sha Chau to Lung Kwu Chau (KP31.5 - 36.0)	1 Jetting Machine (Note 1)	720m day^{-1} for 24 hours each day	Yes	Two layers at Western Boundary of the Sha Chau and Lung Kwu Chau Marine Park (KP31.5 - 36.0)		✓
Sha Chau to Lung Kwu Chau (KP36.0 - 37.5)	1 Jetting Machine (Note 1)	720m day^{-1} for 24 hours each day	Yes	Two layers at Western Boundary of the Sha Chau and Lung Kwu Chau Marine Park (KP36.0 - 37.5)		✓

Work Location	Plants Involved	Allowed Maximum Work Rate	Silt Curtain at Plants	Silt Curtain at Water Sensitive Receivers	Other Measures	Implementation Status
Lung Kwu Chau to Urmston Anchorage (KP37.5 - 41.1)	1 Jetting Machine (Note 1)	1,000m day^{-1} for 24 hours each day	Yes	Two layers at Northwestern corner of Sha Chau and Lung Kwu Chau Marine Park (KP37.5 - 41.1)		✓
Urmston Road (KP41.1 - 42.9)	1 Grab Dredger	8,000m^3 day^{-1} for 24 hours each day	Yes	Not required		✓
West of BPPS (KP42.9 - 44.9)	1 Jetting Machine (Note 1)	1,000m day^{-1} for 24 hours each day	Yes	Two layers at CR1, CR2 (Note 2)		✓
Pipeline shore approach at BPPS (KP44.9 - 45.0)	1 Grab Dredger	1,500m^3 day^{-1} for 24 hours each day	Yes	Two layers at CR1, CR2 (Note 2)		✓

Notes:

(1) No more than two jetting machines will be used for the construction of the subsea gas pipeline of the Project. In addition to existing relevant mitigation measures, the minimum separation distance between the two jetting machines for avoiding cumulative impact is 5km for most of the pipeline sections, except when one jetting machine is working at the subsea cable sterile corridors (i.e. KP1.49 – KP2.75 and KP3.55 – KP4.43). When one jetting machine is working at the subsea cable sterile corridors, no other jetting machine will work concurrently within KP0.0-KP14.25, i.e., between the Jetty and Adamasta Channel.

(2) CR1 and CR2 denote the coral colonies identified at the artificial seawall at BPPS.

ANNEX D

STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS

TABLE D.1 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR WHOLE PROJECT (FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B)

Item	Description	Ref. No.	Date of Expiry	Status
1	Notification Pursuant to Section 3(1) of *Air Pollution Control (Construction Dust) Regulation*	454879	N/A	Valid
2	Billing Account under *Waste Disposal (Charges for Disposal of Construction Waste) Regulation*	7037035	N/A	Valid
3	Registration as Chemical Waste Producer under *Waste Disposal (Chemical Waste) (General) Regulation*	WPN 5213-912-C4445-01 (Note 1)	N/A	Registration completed on 12 May 2020
4	Registration as Chemical Waste Producer under *Waste Disposal (Chemical Waste) (General) Regulation*	WPN 5218-934-C4445-03 (Note 2)	N/A	Registration completed on 22 July 2021
5	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0743-20 (Note 3)	19 Mar 2021	Validity from 2 Oct 2020 to 19 Mar 2021
6	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under Noise Control Ordinance	GW-RS0911-20 (Note 4)	3 Jun 2021	Validity from 4 Dec 2020 to 3 Jun 2021
7	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0955-20 (Note 5)	13 Jun 2021	Validity from 17 Dec 2020 to 13 Jun 2021
8	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0203-21	30 Sep 2021	Validity from 1 Apr to 30 Sep 2021
9	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0732-21	31 Mar 2022	Validity from 1 Oct 2021 to 31 Mar 2022
10	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0175-22	30 Sep 2022	Validity from 1 Apr 2022 to 30 Sep 2022
11	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0774-22	31 Mar 2023	Validity until 31 March 2023
12	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under *Noise Control Ordinance*	GW-RS0204-23	30 Sep 2023	Validity until 30 September 2023

Notes:
(1) The location/premises where the waste is produced (i.e. Working Vessel – Lan Jiang, Lan Jing, Hai Yang Shi You 202) as per the registration.
(2) The location/premises where the waste is produced (i.e. Working Vessel – Mencast Offshore 1, Bin Hai 109, Coastal Supreme, CPOE-101) as per the registration.
(3) Construction Noise Permit GW-RS0743-20 has been withdrawn and replaced by GW-RS0911-20.
(4) Construction Noise Permit GW-RS0911-20 has been withdrawn and replaced by GW-RS0955-20.
(5) Construction Noise Permit GW-RS0955-20 has been withdrawn and replaced by GW-RS0203-21.

TABLE D.2 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR FEP-01/558/2018/A

Item	Description	Ref. No.	Date of Expiry	Status
1	Further Environmental Permit under *EIA Ordinance*	FEP-01/558/2018	N/A	Issued on 17 Jan 2020
2	Further Environmental Permit under *EIA Ordinance*	FEP-01/558/2018/A	N/A	Issued on 6 Nov 2020
3	Construction Noise Permit (for construction site of the water space between South of Shek Kwu Chau and East of Soko Islands, offshore area near boundary of Hong Kong) under *Noise Control Ordinance*	PP-RS0011-20 (Note 1)	30 Sep 2020	Validity from 1 to 30 Sep 2020
4	Construction Noise Permit (for construction site of the water space between South of Shek Kwu Chau and East of Soko Islands, offshore area near boundary of Hong Kong) under *Noise Control Ordinance*	PP-RS0013-20 (Note 2)	31 Dec 2020	Validity from 9 Oct to 31 Dec 2020
5	Construction Noise Permit (for construction site of the water space between South of Shek Kwu Chau and East of Soko Islands offshore area near boundary of Hong Kong) under *Noise Control Ordinance*	PP-RS0008-21	31 Dec 2021	Validity from 2 Jul to 31 Dec 2021
6	Certificate of Approval on Installation of Chimneys/Flues connected to Emergency Generator under *Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration Regulations*	(7) in 475740 (Note 3)	N/A	Approval issued on 6 Jan 2022
7	Wastewater Discharge License under *Water Pollution Control Ordinance*	WT00042533-2022	31 Jan 2028	Approval issued on 9 Jan 2023

Notes:
(1) Construction Noise Permit PP-RS0011-20 has been withdrawn and replaced by PP-RS0013-20.
(2) Construction Noise Permit PP-RS0013-20 has been withdrawn and replaced by PP-RS0008-21.
(3) The location/premises where the chimney/flue is installed (i.e. The Offshore LNG Terminal) as per the certificate.

TABLE D.3 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR FEP-02/558/2018/A

Item	Description	Ref. No.	Date of Expiry	Status
1	Further Environmental Permit under *EIA Ordinance*	FEP-02/558/2018	N/A	Issued on 17 Jan 2020
2	Further Environmental Permit under *EIA Ordinance*	FEP-02/558/2018/A	N/A	Issued on 22 Dec 2020
3	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/21-055	12 Jul 2021	Issued on 13 Jan 2021
4	Wastewater Discharge License under *Water Pollution Control Ordinance*	WT00039668-2021 (Note 1)	31 Jan 2024	Validity from 17 Jan 2022 to 31 Jan 2024

Notes:
(1) The location/premises where the industrial trade effluent is discharged into marine water (i.e. Jetty Platform (MD1) of offshore LNG Terminal located at about 936m distance from South-West Hong Kong Water Boundary) as per the license.

TABLE D.4 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR FEP-03/558/2018/B

Item	Description	Ref. No.	Date of Expiry	Status
1	Further Environmental Permit under *EIA Ordinance*	FEP-03/558/2018	N/A	Issued on 17 Jan 2020
2	Further Environmental Permit under *EIA Ordinance*	FEP-03/558/2018/A	N/A	Issued on 22 Jan 2021
3	Further Environmental Permit under *EIA Ordinance*	FEP-03/558/2018/B	N/A	Issued on 25 Aug 2021
4	Registration as Chemical Waste Producer under *Waste Disposal (Chemical Waste) (General) Regulation*	WPN 5293-431-P2781-26 (Note 1)	N/A	Registration completed on 1 Dec 2020
5	Wastewater Discharge License under *Water Pollution Control Ordinance*	WT00037473-2021 (Note 2)	31 Mar 2026	Validity from 9 Mar 2021 to 31 Mar 2026
6	Construction Noise Permit (for offshore construction site near Urmston Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0389-20 (Note 3)	14 Feb 2021	Validity from 28 Aug 2020 to 14 Feb 2021
7	Construction Noise Permit (for construction site near Eastern Road, BPPS, Yung Long Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0407-20 (Note 4)	6 Mar 2021	Validity from 11 Sept 2020 to 6 Mar 2021
8	Construction Noise Permit (for offshore construction site near Urmston Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0037-21 (Note 5)	30 Jun 2021	Validity from 15 Feb 2021 to 30 Jun 2021
9	Construction Noise Permit (for construction site near Eastern Road, BPPS, Yung Long Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0067-21 (Note 6)	6 Sep 2021	Validity from 7 Mar to 6 Sep 2021
10	Construction Noise Permit (for offshore construction site near	GW-RW0104-21	30 Sep 2021	Validity from 5 Apr to 30 Sep 2021

Item	Description	Ref. No.	Date of Expiry	Status
	Urmston Road, Tuen Mun) under *Noise Control Ordinance*			
11	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/21-046	11 Oct 2021	Issued on 9 Apr 2021
12	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/21-050 (Note 7)	11 May 2021	Issued on 9 Apr 2021
13	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/21-127	11 Oct 2021	Issued on 9 Apr 2021
14	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/22-004 (Note 8)	11 Jun 2021	Issued on 10 May 2021
15	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/22-011	20 Nov 2021	Issued on 21 May 2021
16	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/22-018	11 Jul 2021	Issued on 11 Jun 2021
17	Marine Dumping Permit under *Dumping at Sea Ordinance*	EP/MD/22-047	19 Sep 2021	Issued on 19 Aug 2021
18	Wastewater Discharge License under *Water Pollution Control Ordinance*	WT00037750-2021 (Note 9)	31 Oct 2023	Validity from 12 Oct 2021 to 31 Mar 2023
19	Wastewater Discharge License under *Water Pollution Control Ordinance*	WT00040543-2022 (Note 9)	31 May 2024	Validity from 4 May 2022 to 31 May 2024
20	Construction Noise Permit (for construction site near Eastern Road, BPPS, Yung Long Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0340-21	6 Mar 2022	Validity from 7 Sep 2021 to 6 Mar 2022
21	Construction Noise Permit (for offshore construction site near Urmston Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0363-21	31 Mar 2022	Validity from 1 Oct 2021 to 31 Mar 2022
22	Construction Noise Permit (for construction site near Eastern Road, BPPS, Yung Long Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0552-21	9 Jun 2022	Validity from 31 Dec 2021 to 9 Jun 2022
		GW-RW0293-22	9 Sep 2022	Validity from 10 May 2022 to 9 Sep 2022
23	Construction Noise Permit (for construction site near Eastern Road, BPPS, Yung Long Road, Tuen Mun) under *Noise Control Ordinance*	GW-RW0152-22	30 Sep 2022	Validity from 1 Apr 2022 to 30 Sep 2022
		GW-RW0543-22	31 Mar 2023	Validity until 31 Mar 2023

Notes:
(1) The location/premises where the waste is produced (i.e. Black Point Power Station) as per the registration.
(2) The location/premises where the industrial trade effluent is discharged into communal storm water drain (i.e. construction site at Black Point Power Station, Tuen Mun) as per the license.
(3) Construction Noise Permit GW-RW0389-20 has been replaced by GW-RW0037-21 since 15 February 2021.
(4) Construction Noise Permit GW-RW0407-20 has been replaced by GW-RW0067-21 since 7 March 2021.
(5) Construction Noise Permit GW-RW0037-21 has been replaced by GW-RW0104-21 since 5 April 2021.
(6) Construction Noise Permit GW-RW0067-21 has been replaced by GW-RW0340-21 since 7 September 2021.
(7) Marine Dumping Permit EP/MD/21-050 has been renewed to a separate permit (EP/MD/22-004).
(8) Marine Dumping Permit EP/MD/22-004 has been renewed to a separate permit (EP/MD/22-018).
(9) The location/premises where the industrial trade effluent is discharged into marine water (i.e. Jetty Platform (MD1) of offshore LNG Terminal located at about 936m distance from South-West Hong Kong Water Boundary) as per the license.

TABLE D.5 STATUS OF SUBMISSIONS UNDER FURTHER ENVIRONMENTAL PERMITS

EP Condition	Submission	Status
FEP-01/558/2018/A		
2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 4.2 4.4 4.6 4.8 4.9 4.10 5.3	Management Organization Updated EM&A Manual Location Plan Construction Works Schedule Piling Installation Plan Review Report on Finless Porpoise Peak Occurrence Season Baseline Study Report on Phytoplankton, Zooplankton and Benthic Organisms Waste Management Plan Safety Management Plan Marine Routing Plan of the FSRU Vessel Design Plan of the FSRU Seawater Intake Mitigation Proposal for Emergency Gas Discharge and Accidental Spillage Emergency Response Plan Environmental Enhancement Plan Baseline Monitoring Report	Accepted / approved by EPD
5.4	Monthly EM&A Reports	Submitted to EPD
4.11	Maintenance Dredging Plan	To be submitted no later than 6 months before the commencement of maintenance dredging works for the Project
FEP-02/558/2018/A		
2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 4.2 4.5 4.6 5.3	Management Organization Updated EM&A Manual Location Plan Construction Works Schedule Pipeline Construction Plan Pipeline Laying Method Plan Silt Curtain Deployment Plan Waste Management Plan Safety Management Plan Emergency Response Plan Environmental Enhancement Plan Baseline Monitoring Report	Accepted / approved by EPD
5.4	Monthly EM&A Reports	Submitted to EPD
FEP-03/558/2018/B		
2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 4.2 4.5 4.6	Management Organization Updated EM&A Manual Location Plan Construction Works Schedule Pipeline Construction Plan Pipeline Laying Method Plan Silt Curtain Deployment Plan Waste Management Plan Safety Management Plan Emergency Response Plan Environmental Enhancement Plan	Accepted / approved by EPD

EP Condition	Submission	Status
5.3	Baseline Monitoring Report	
5.4	Monthly EM&A Reports	Submitted to EPD

ANNEX E

CUMULATIVE STATISTICS ON EXCEEDANCES, ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

TABLE E.1 CUMULATIVE STATISTICS ON EXCEEDANCES FOR FEP-01/558/2018/A

Monitoring Parameter	Level of Exceedance	Total no. recorded since project commencement
Marine Mammal (STG & ANI) (running quarterly)	Action	0
	Limit	0

TABLE E.2 CUMULATIVE STATISTICS ON ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS FOR FEP-01/558/2018/A

Period	Cumulative Statistics		
	Environmental Complaints	Notification of Summons	Successful Prosecutions
Total no. recorded since project commencement	1	0	0

TABLE E.3 CUMULATIVE STATISTICS ON EXCEEDANCES FOR FEP-02/558/2018/A

Monitoring Parameter	Level of Exceedance	Total no. recorded since project commencement [1]
Marine Water Quality (DO) (surface & middle)	Action	0
	Limit	0
Marine Water Quality (DO) (bottom)	Action	0
	Limit	0
Marine Water Quality (Turbidity) (depth-averaged)	Action	0
	Limit	0
Marine Water Quality (SS) (depth-averaged)	Action	0
	Limit	0

Note 1: Exceedances, which are non-project related, are not shown in this table.

TABLE E.4 CUMULATIVE STATISTICS ON ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS FOR FEP-02/558/2018/A

Period	Cumulative Statistics		
	Environmental Complaints	Notification of Summons	Successful Prosecutions
Total no. recorded since project commencement	3	0	0

TABLE E.5 CUMULATIVE STATISTICS ON EXCEEDANCES FOR FEP-03/558/2018/B

Monitoring Parameter	Level of Exceedance	Total no. recorded since project commencement
Marine Water Quality (DO) (surface & middle)	Action	0
	Limit	0
Marine Water Quality (DO) (bottom)	Action	0
	Limit	0
Marine Water Quality (Turbidity) (depth-averaged)	Action	0
	Limit	0
Marine Water Quality (SS) (depth-averaged)	Action	0
	Limit	0

Note 1: Exceedances, which are non-project related, are not shown in this table.

TABLE E.6 CUMULATIVE STATISTICS ON ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS FOR FEP-03/558/2018/B

Period	Cumulative Statistics		
	Environmental Complaints	Notification of Summons	Successful Prosecutions
Total no. recorded since project commencement	1	0	0

ANNEX F

GRAPHICAL PRESENTATION OF MARINE WATER QUALITY MONITORING RESULTS

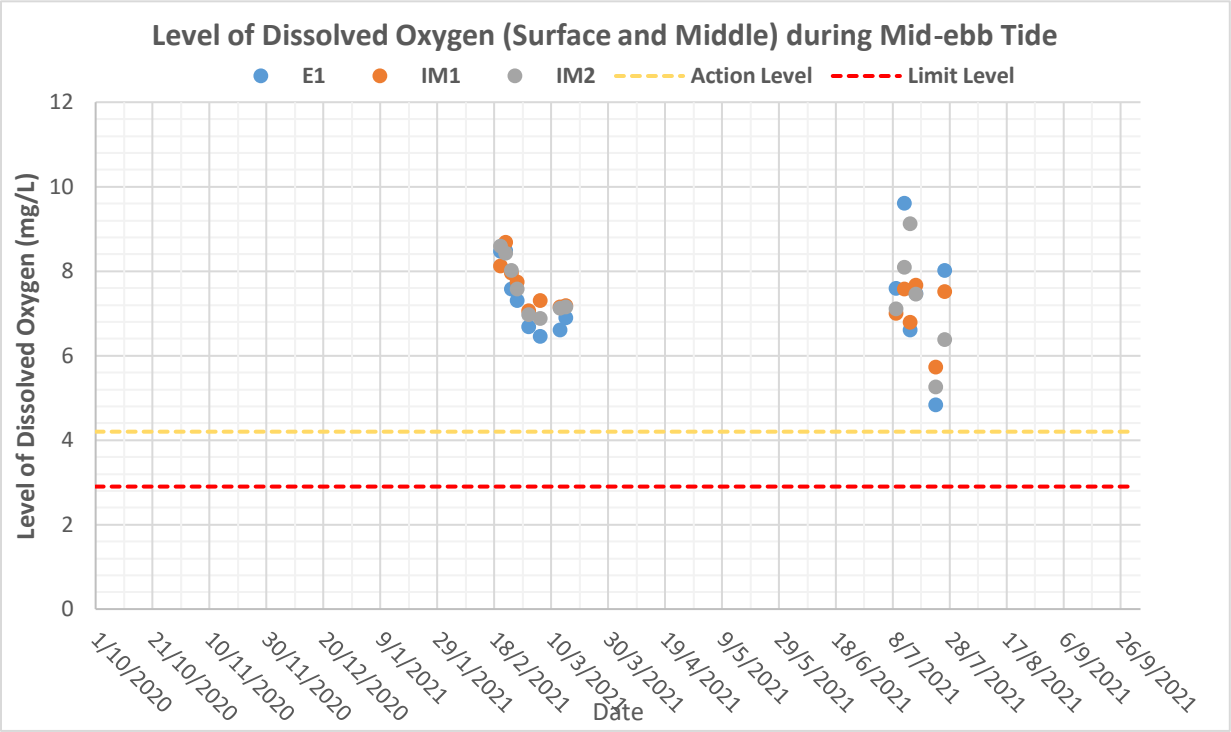


Figure F1a: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E1) and impact stations (IM1-IM2) under Group 1 during mid-ebb tides between October 2020 and September 2021

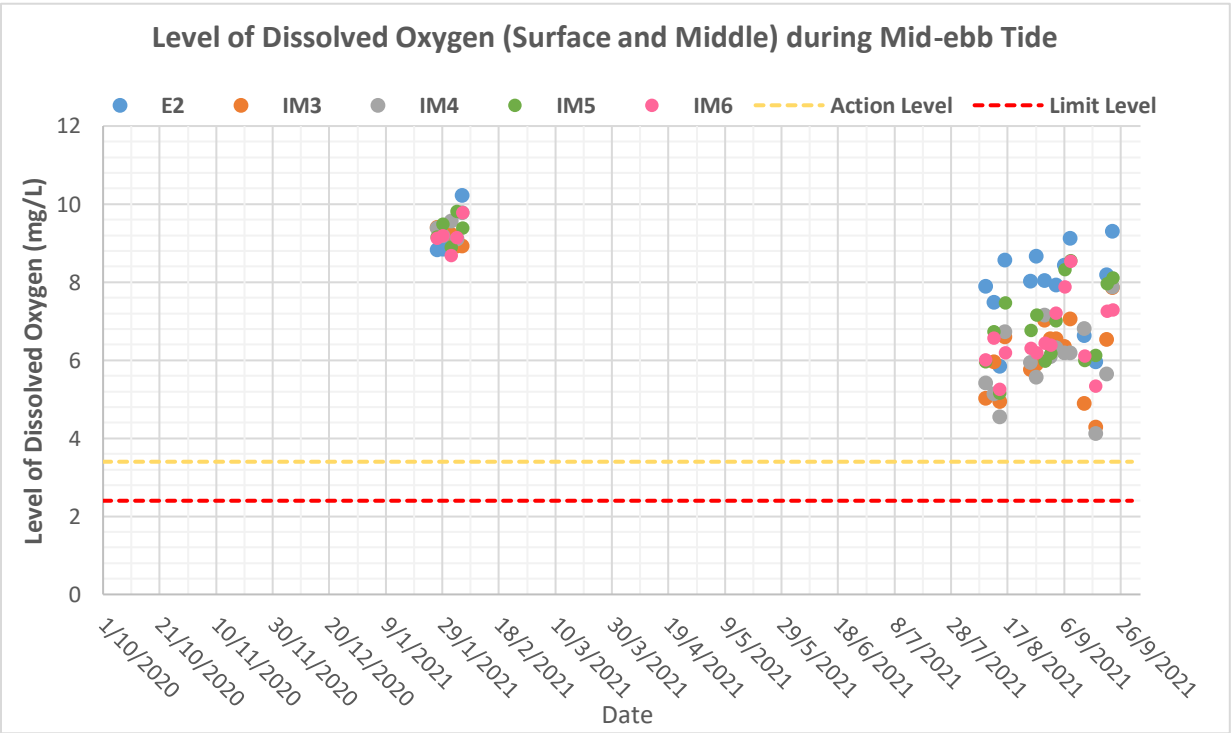


Figure F1b: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2020 and September 2021

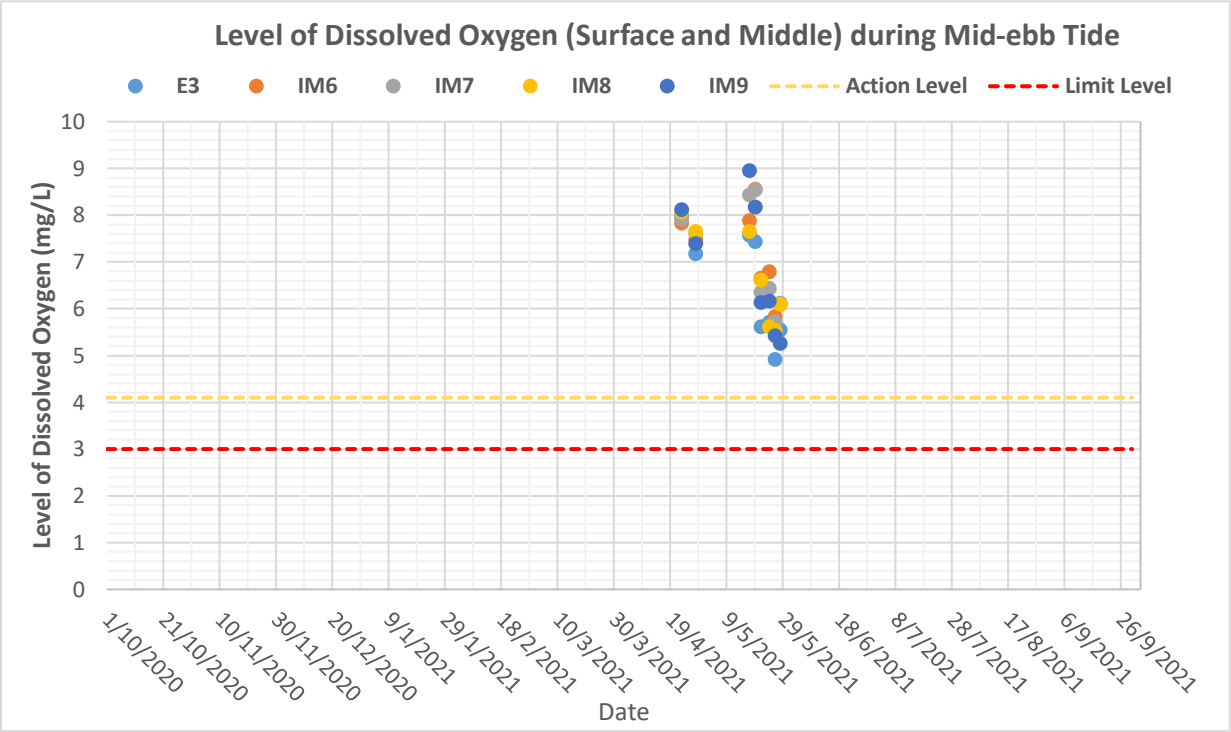


Figure F1c: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2020 and September 2021

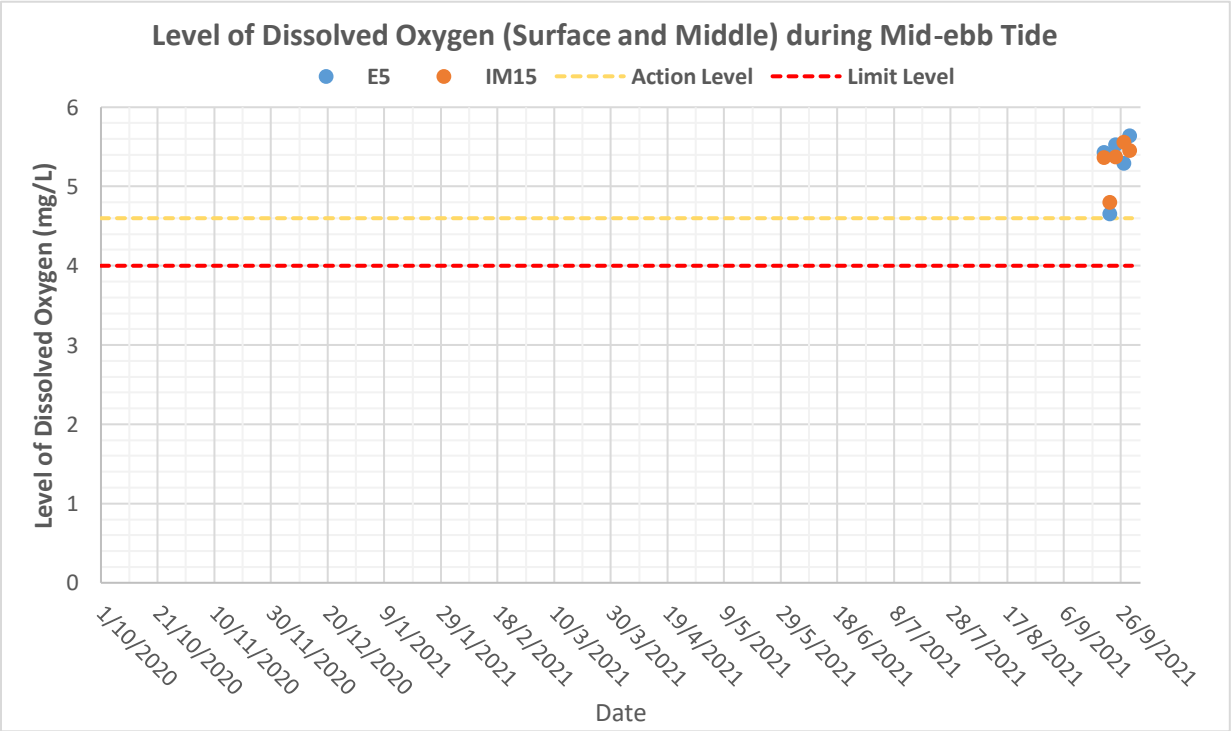


Figure F1d: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2020 and September 2021

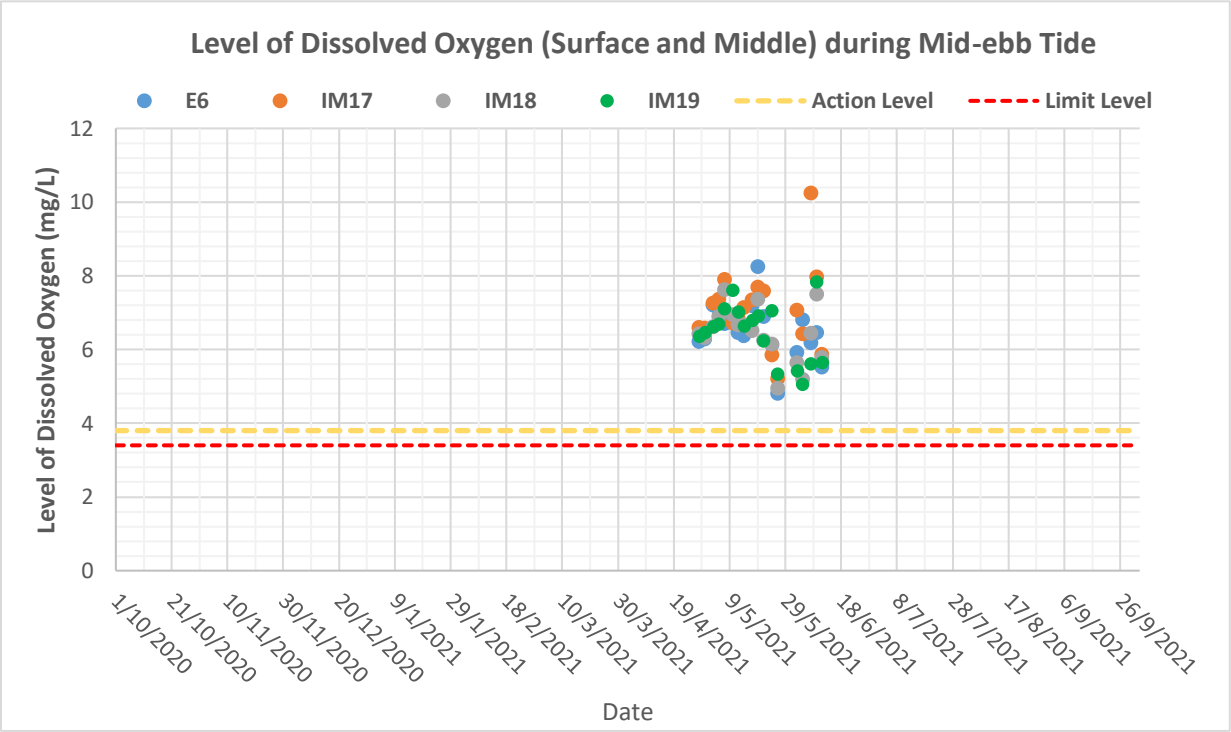


Figure F1e: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2020 and September 2021

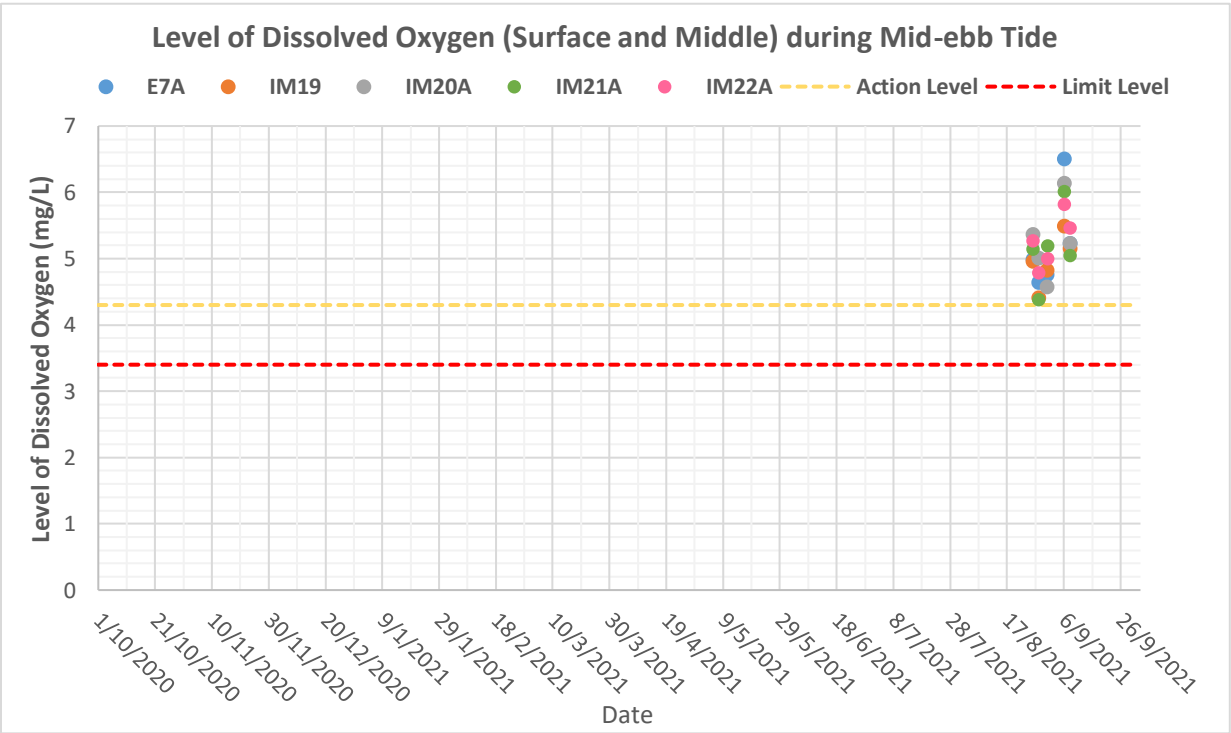


Figure F1f: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2020 and September 2021

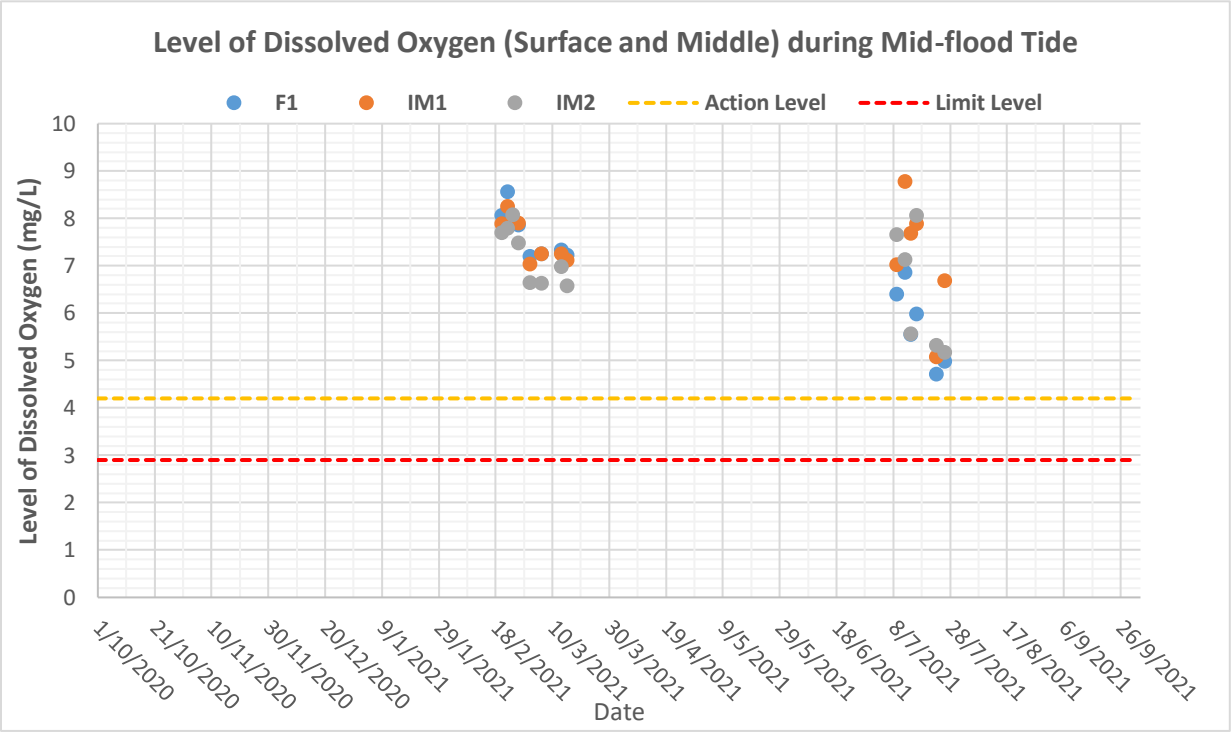


Figure F1g: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F1) and impact stations (IM1-IM2) under Group 1 during mid-flood tides between October 2020 and September 2021

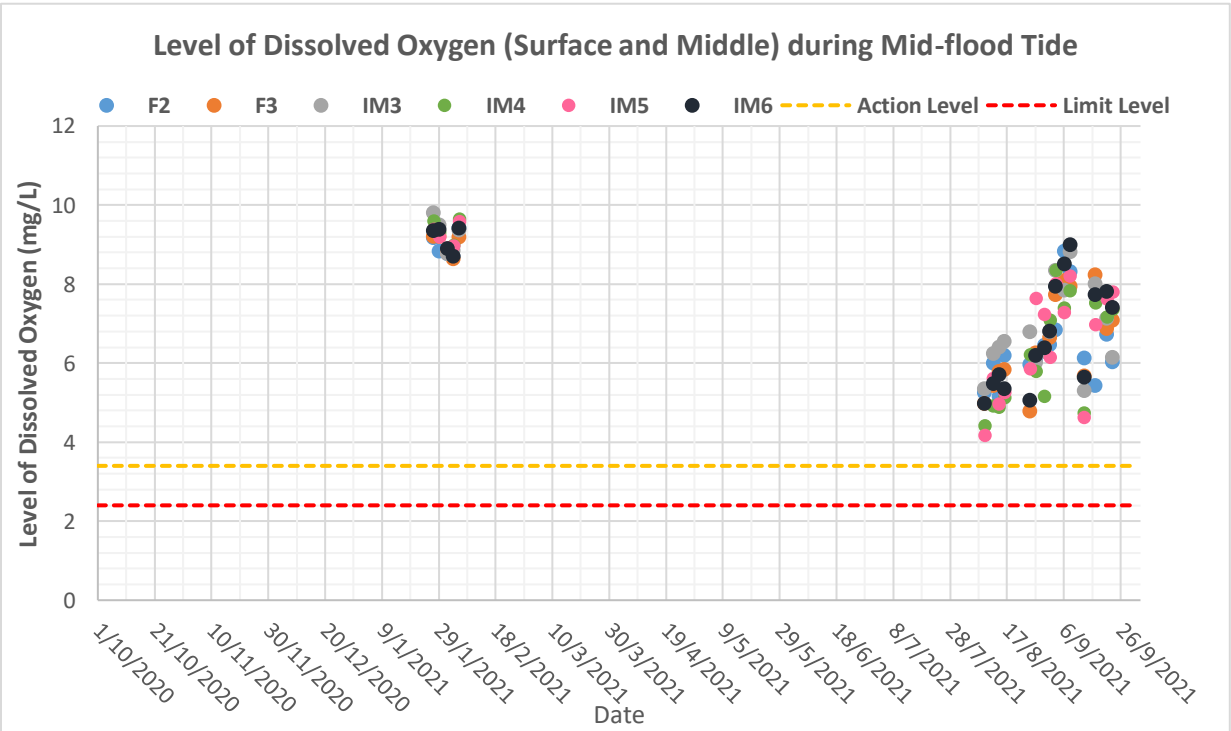


Figure F1h: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2020 and September 2021

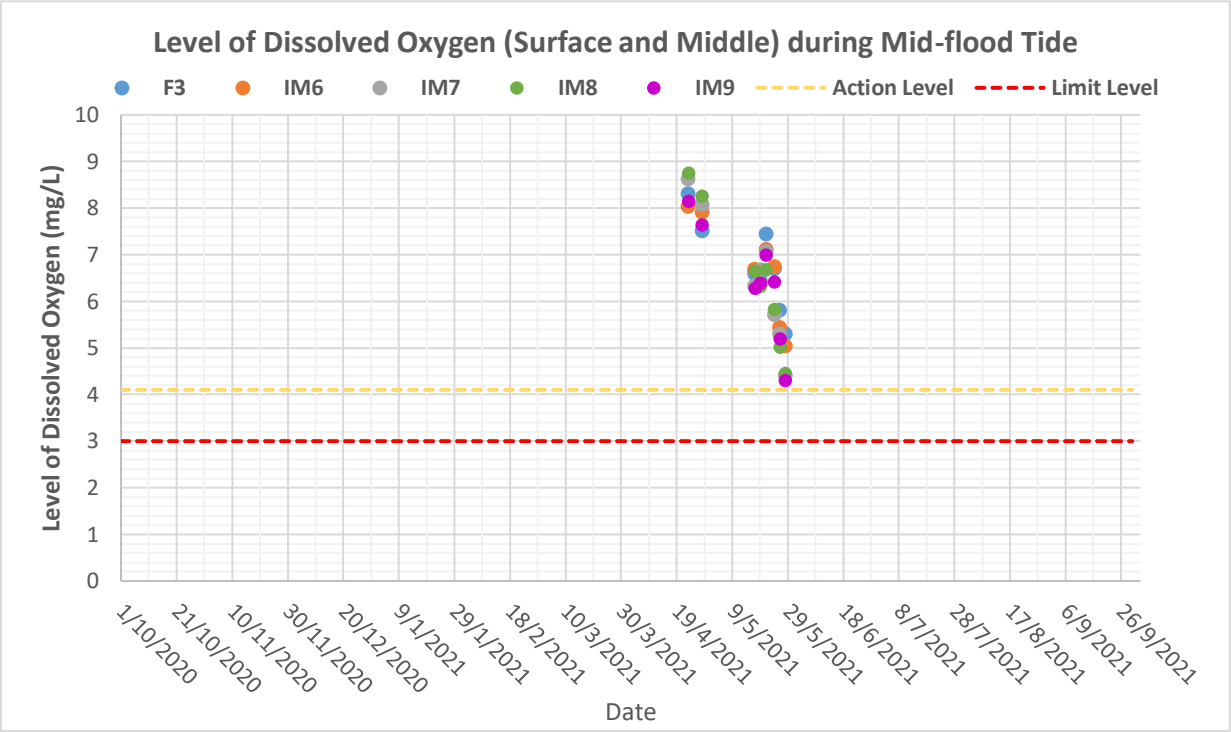


Figure F1i: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2020 and September 2021

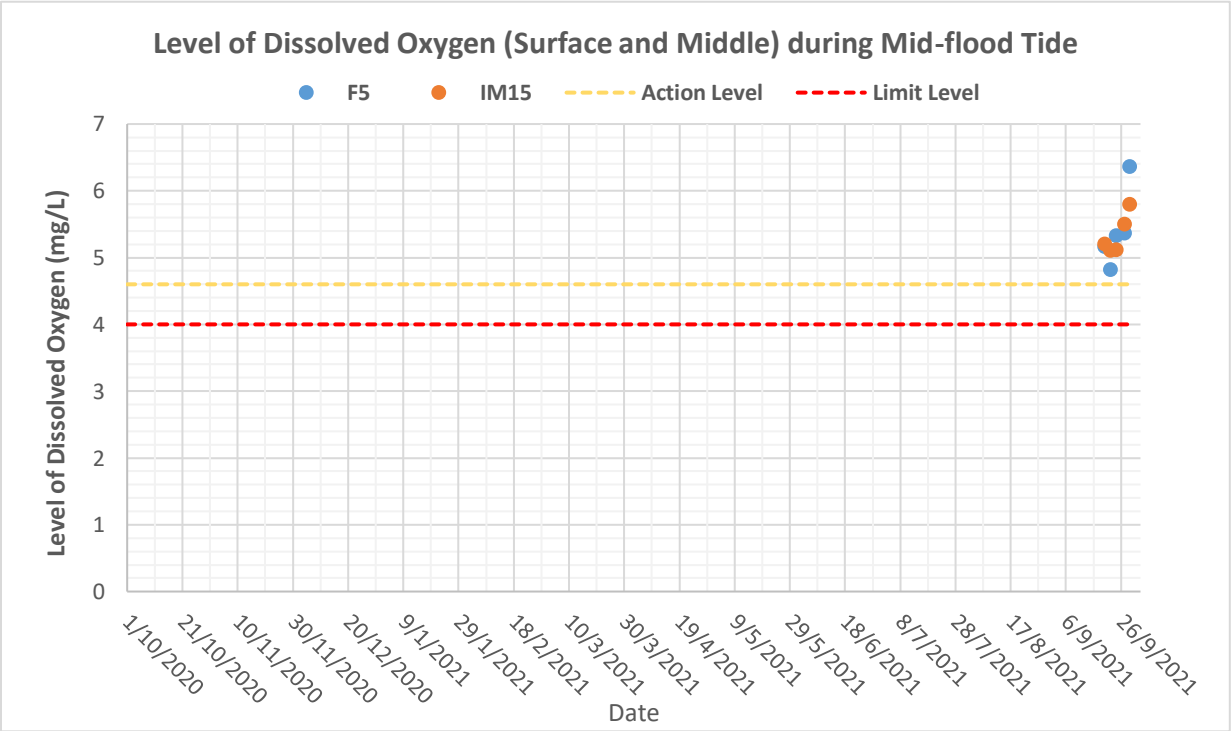


Figure F1j: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2020 and September 2021

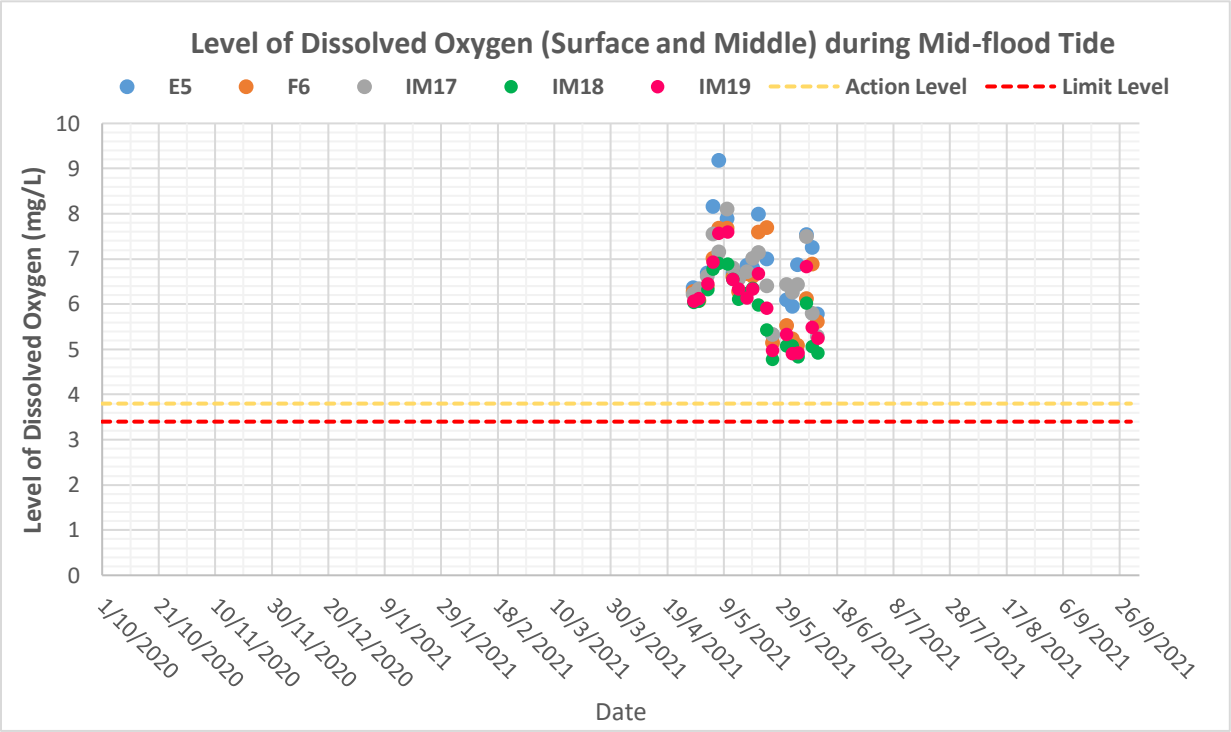


Figure F1k: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2020 and September 2021

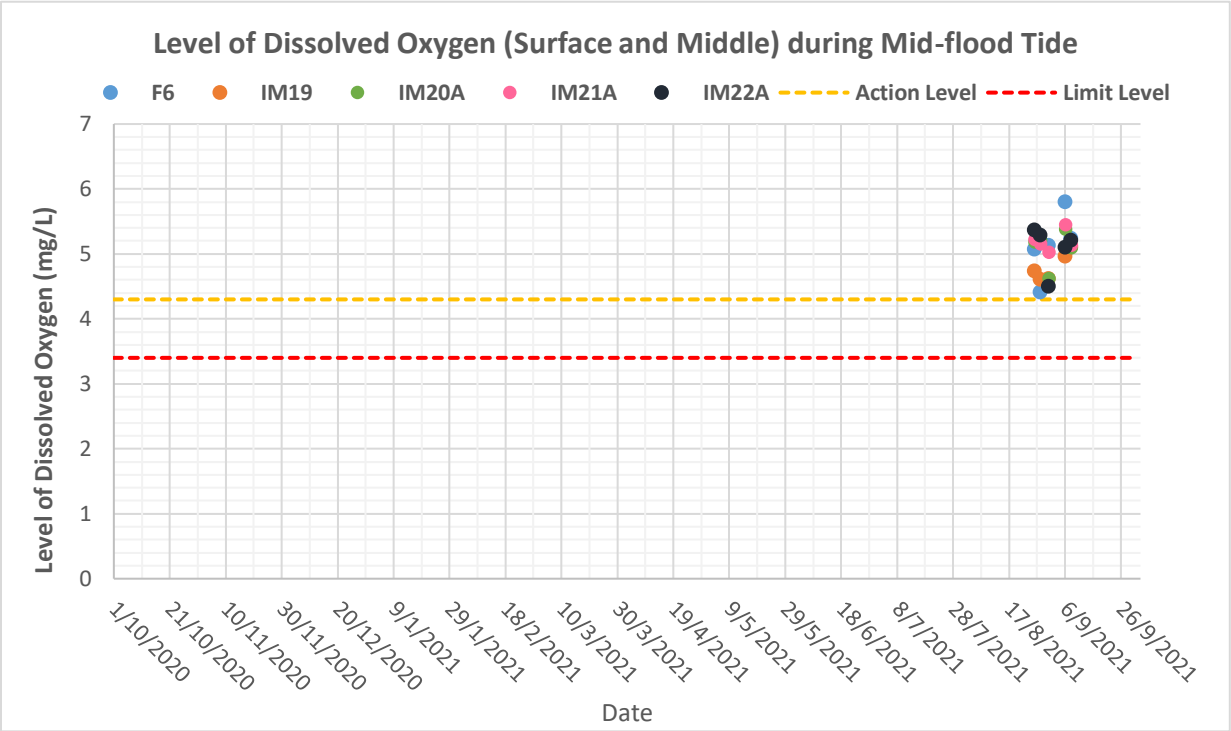


Figure F1l: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2020 and September 2021

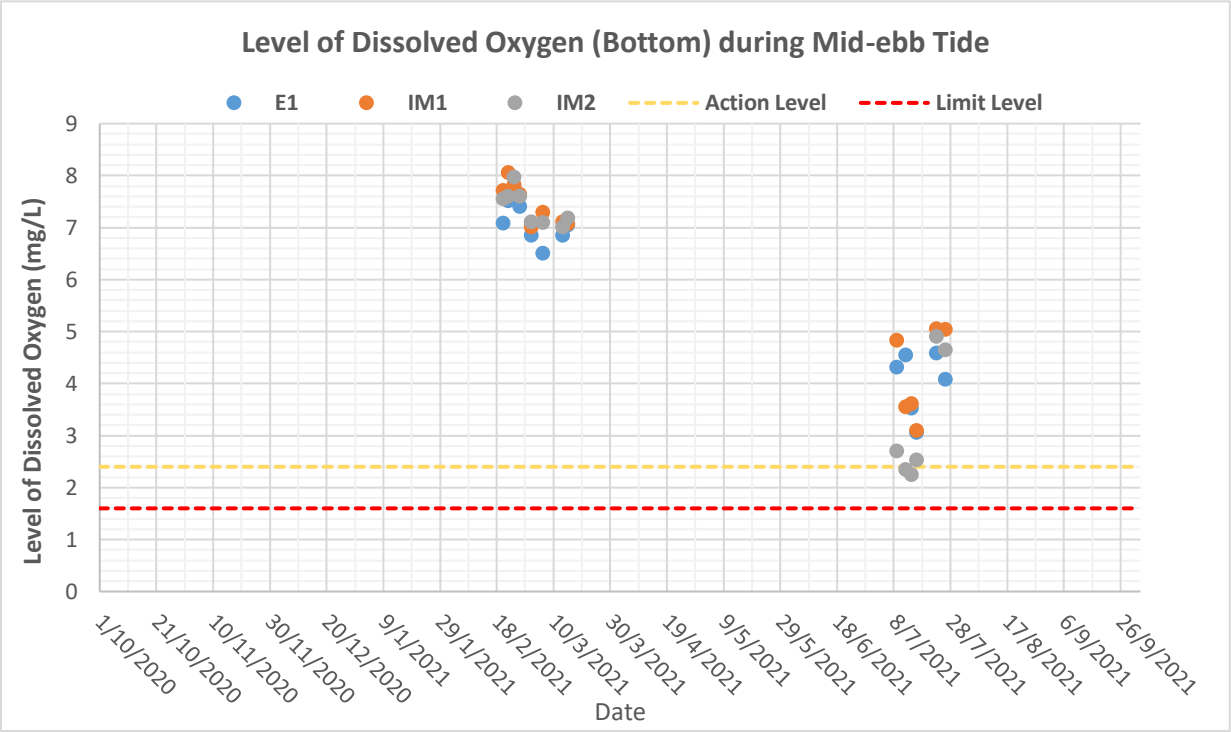


Figure F2a: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E1) and impact stations (IM1-IM2) under Group 1 during mid-ebb tides between October 2020 and September 2021

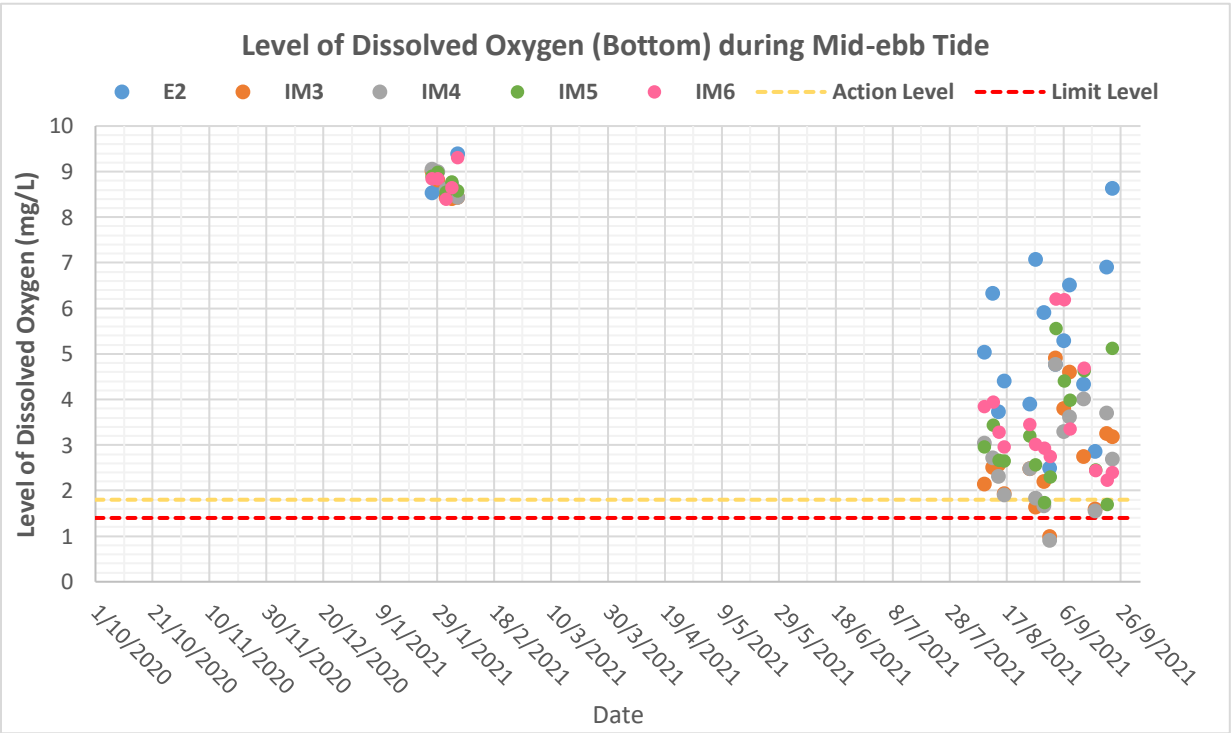


Figure F2b: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2020 and September 2021

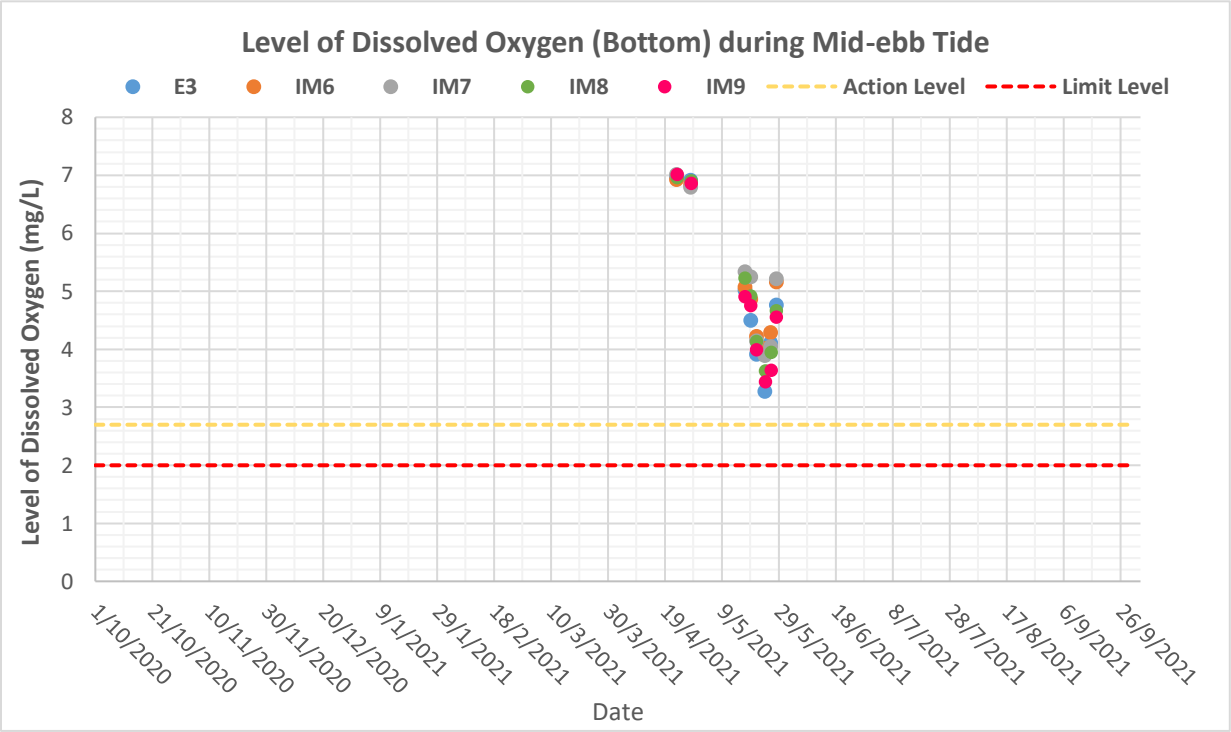


Figure F2c: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2020 and September 2021

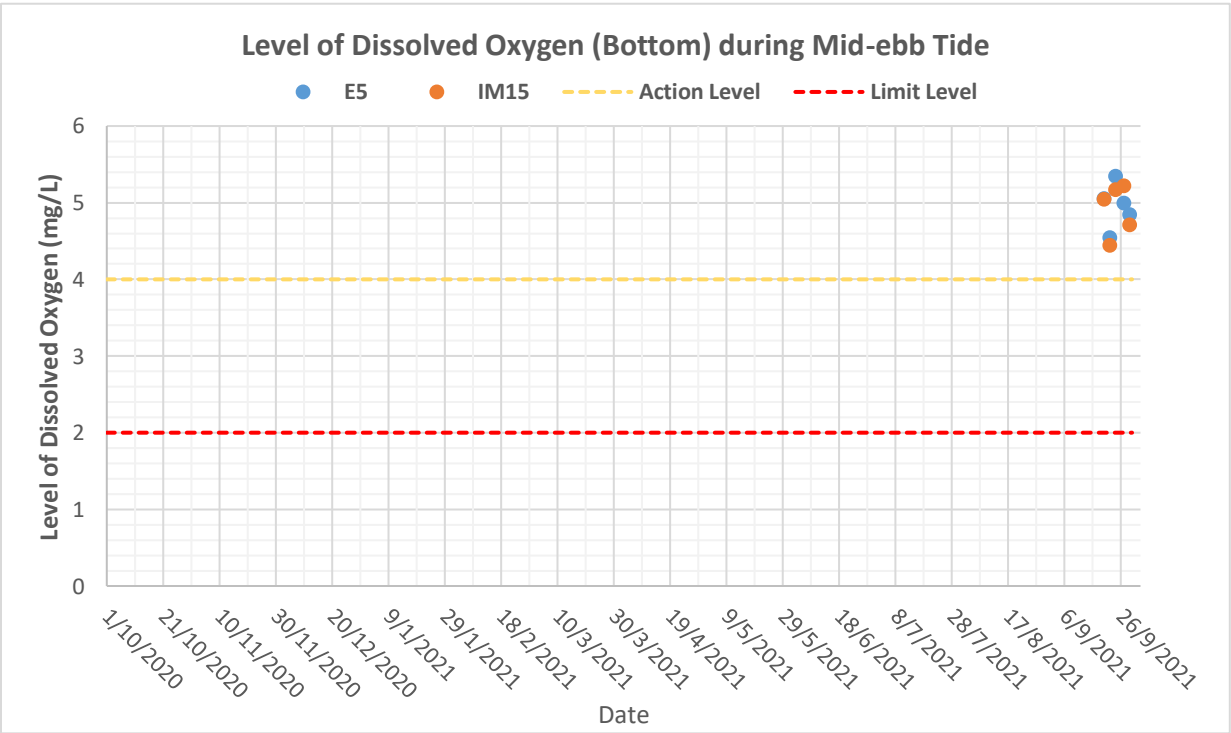


Figure F2d: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2020 and September 2021

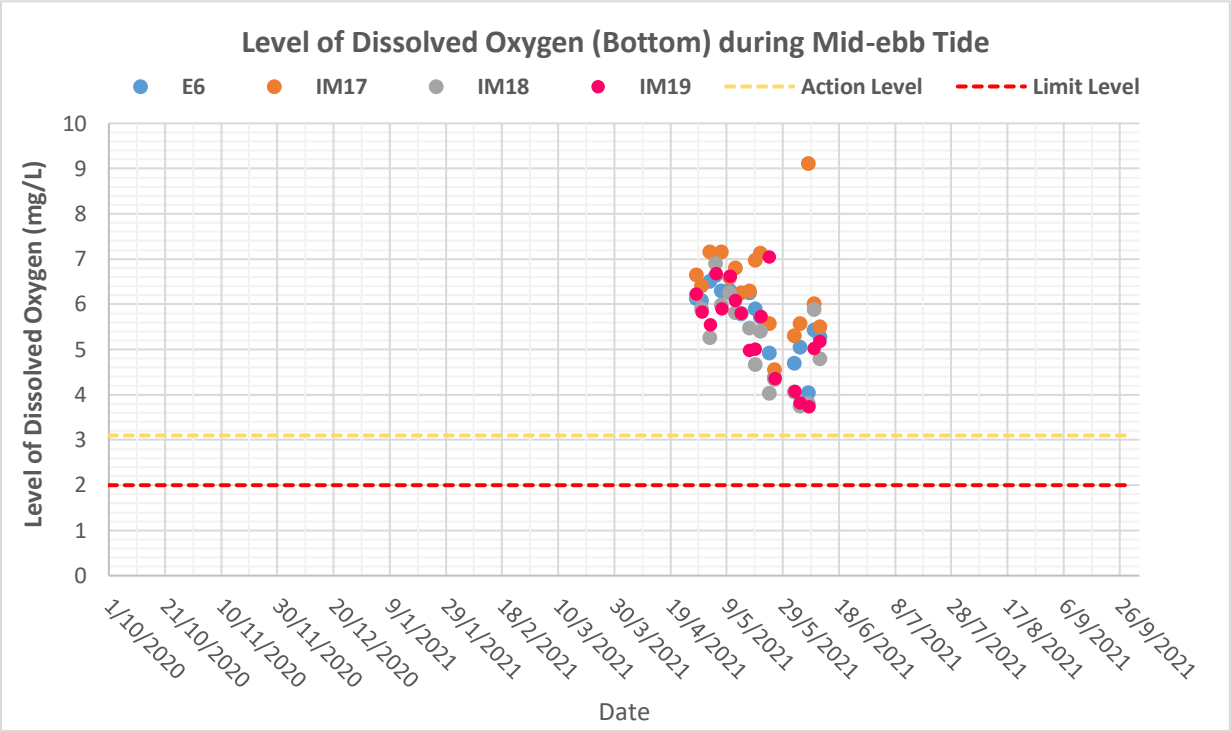


Figure F2e: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2020 and September 2021

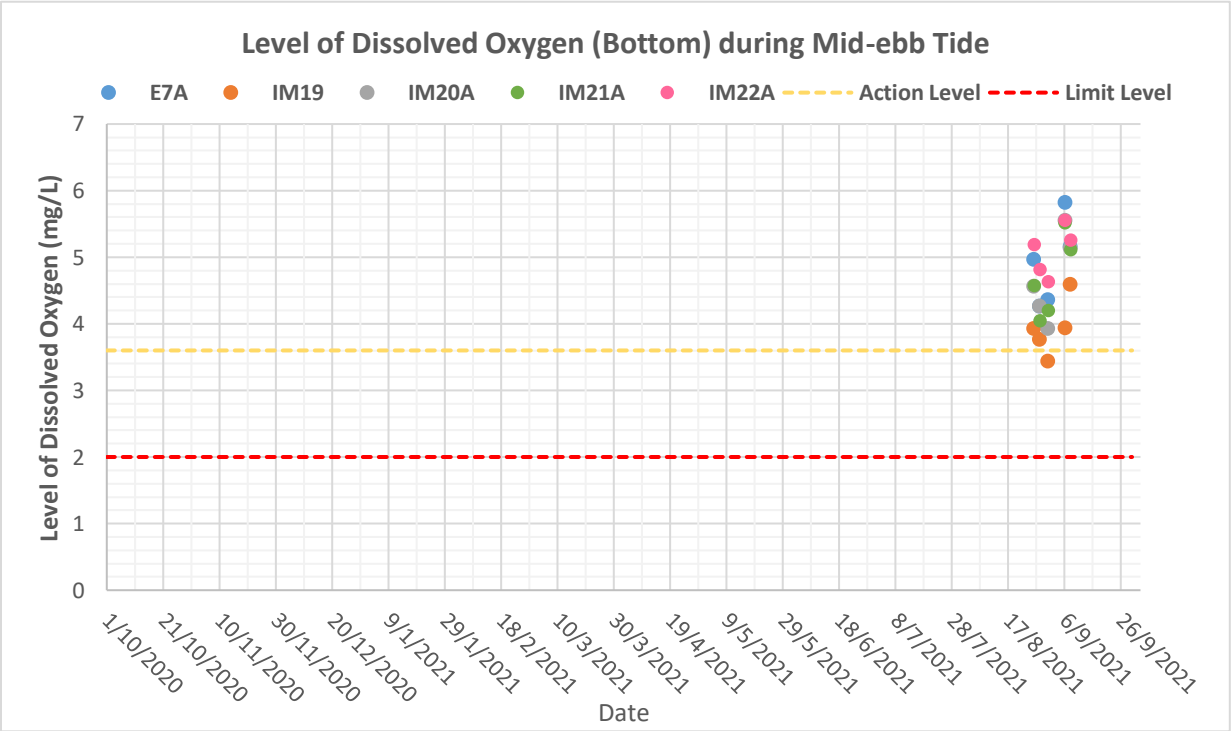


Figure F2f: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2020 and September 2021

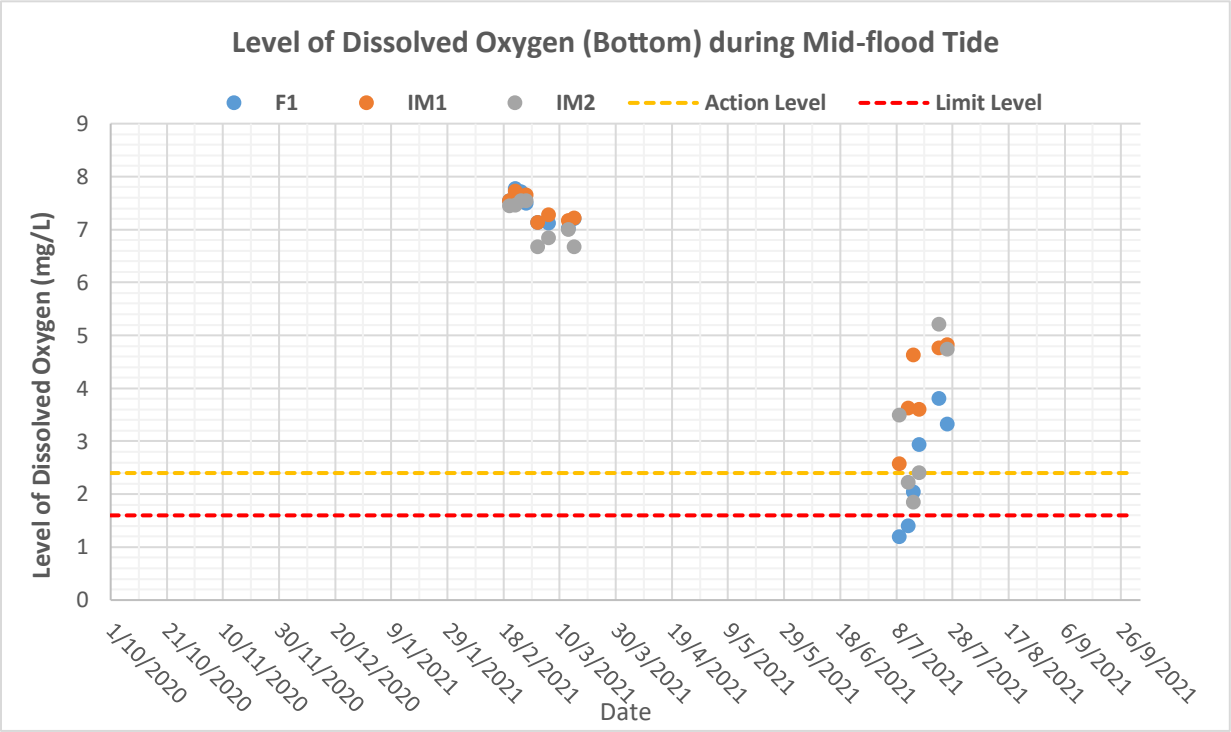


Figure F2g: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F1) and impact stations (IM1-IM2) under Group 1 during mid-flood tides between October 2020 and September 2021

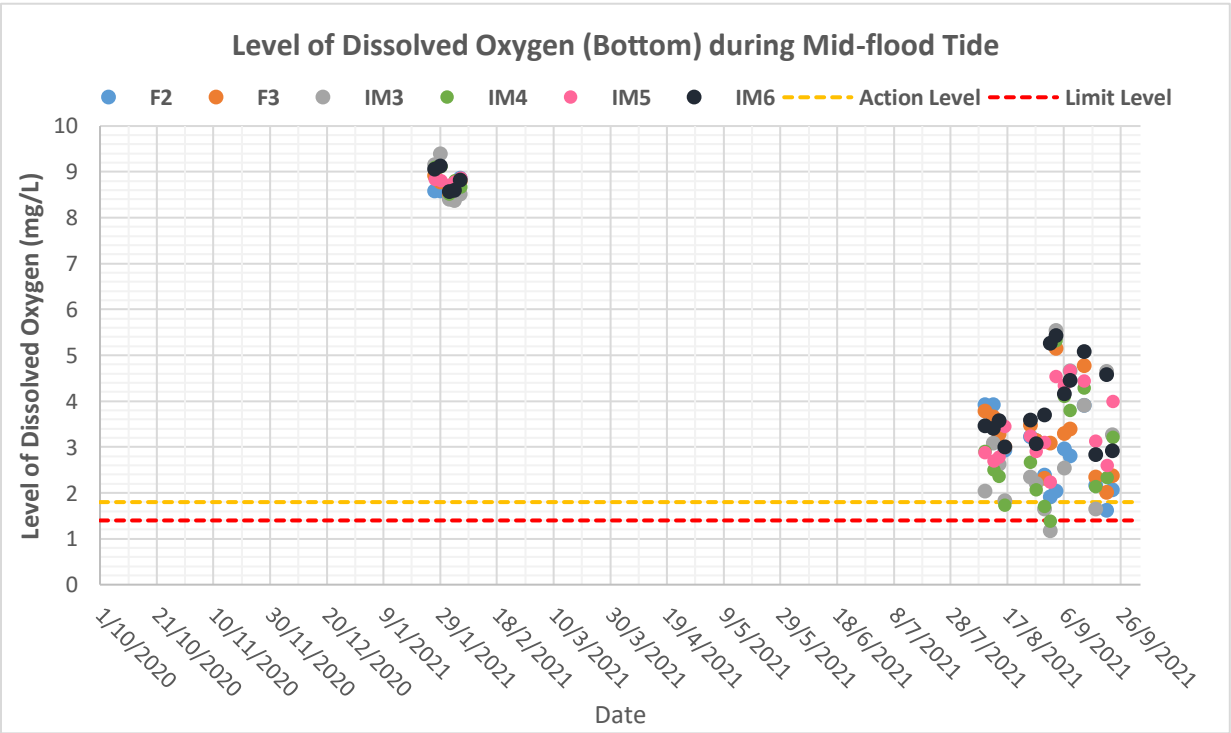


Figure F2h: Levels of Bottom Dissolved Oxygen (mg/L) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2020 and September 2021

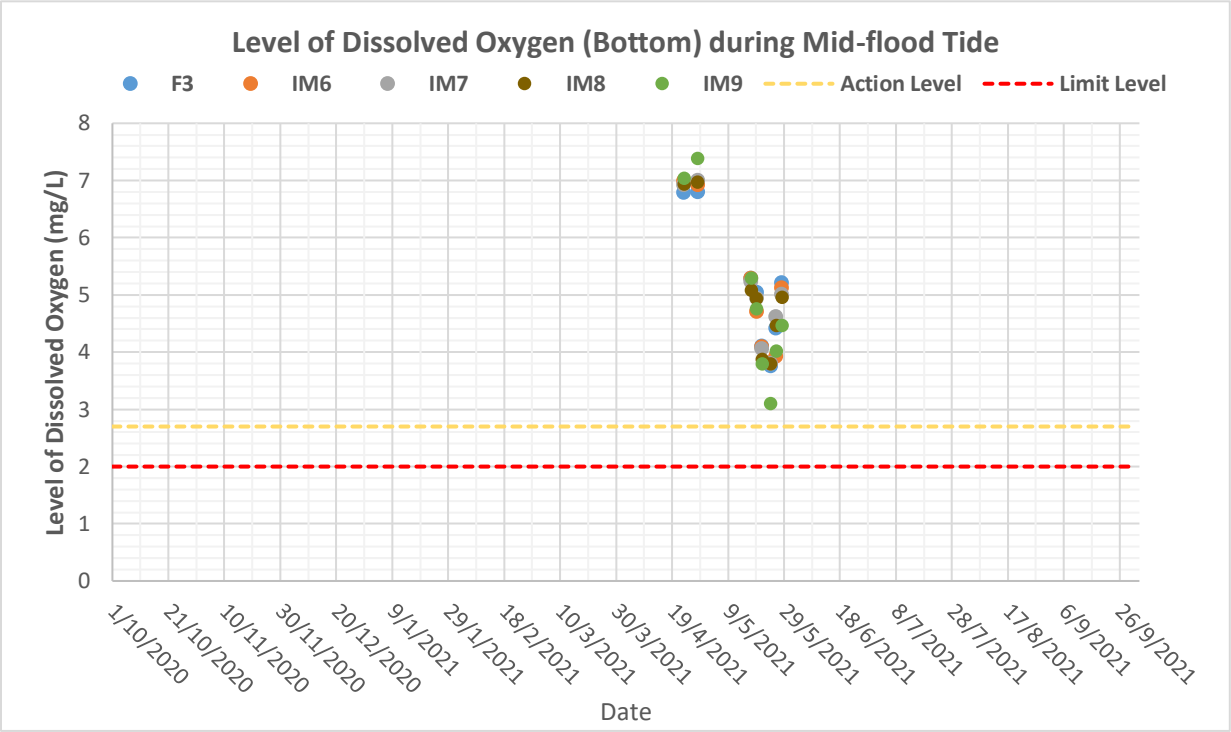


Figure F2i: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2020 and September 2021

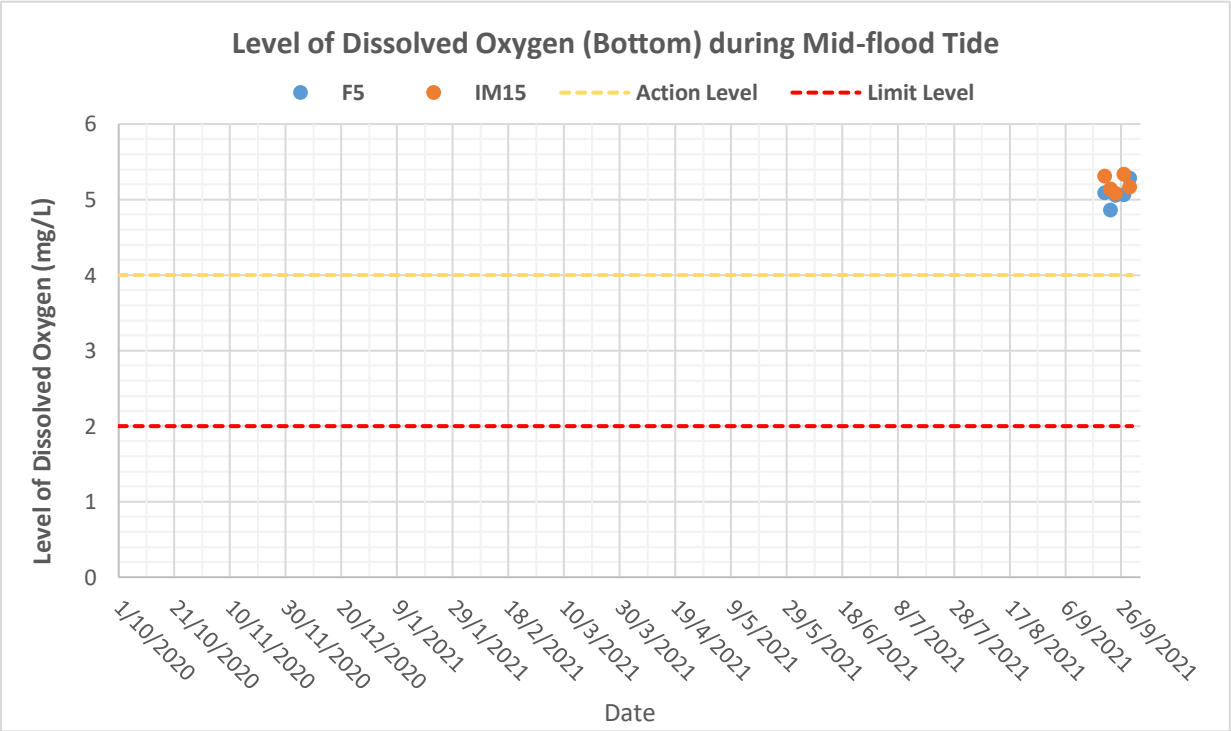


Figure F2j: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2020 and September 2021

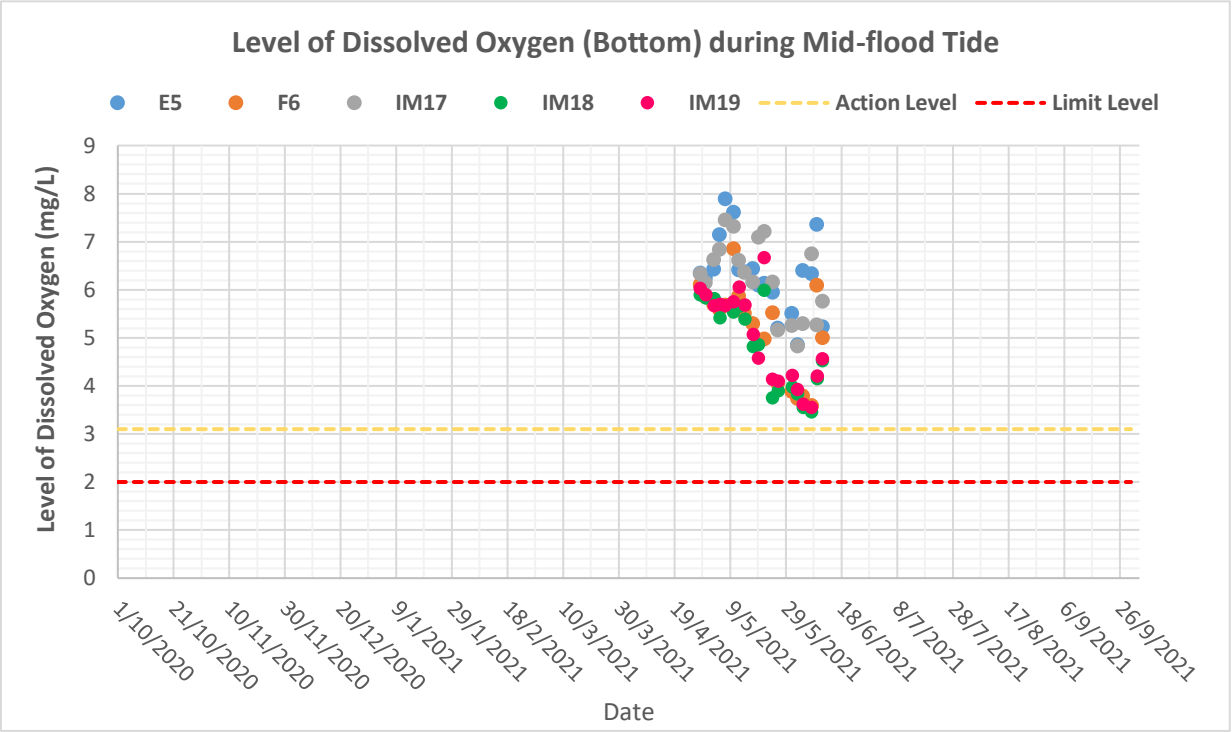


Figure F2k: Levels of Bottom Dissolved Oxygen (mg/L) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2020 and September 2021

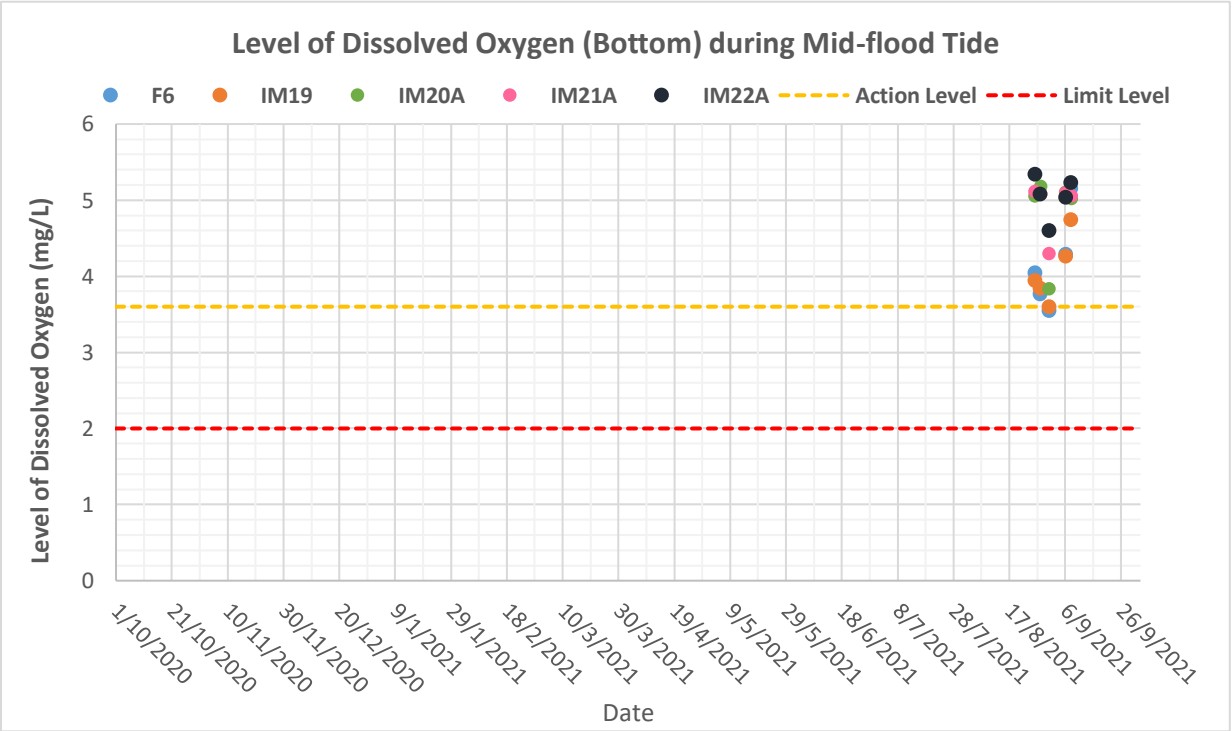


Figure F2l: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2020 and September 2021

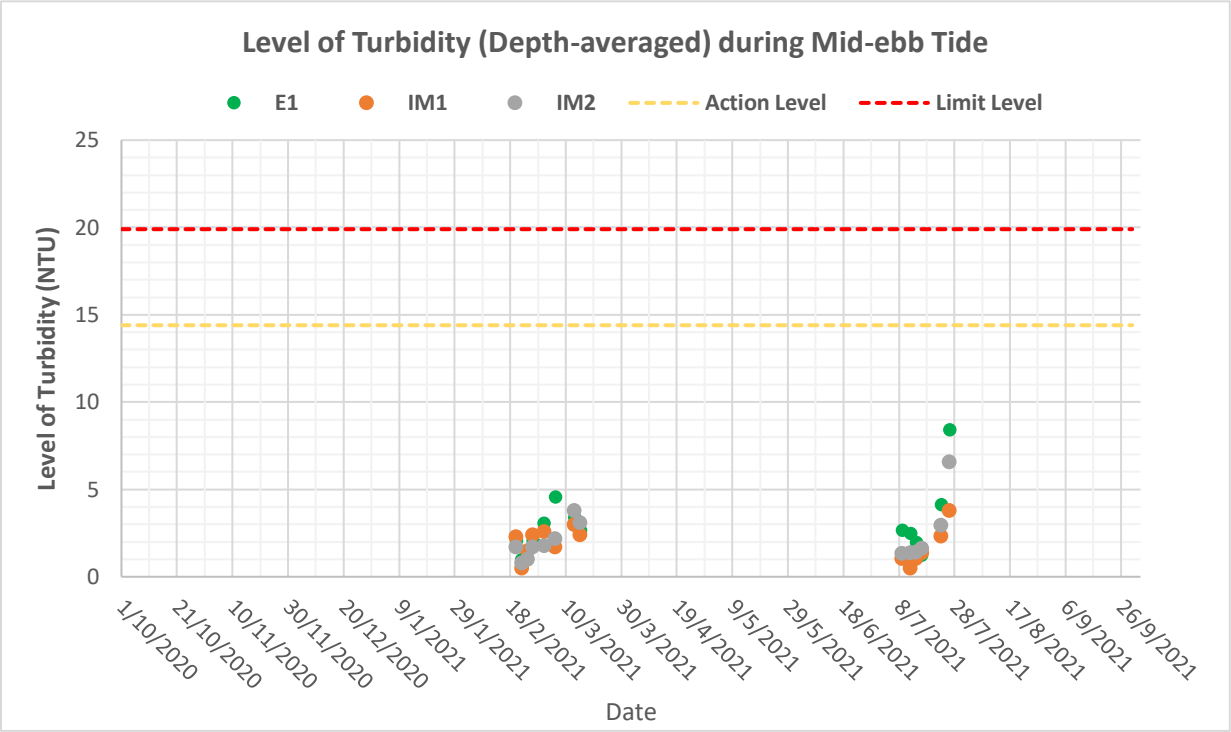


Figure F3a: Levels of Depth-averaged Turbidity (NTU) at control station (E1) and impact stations (IM1-IM2) under Group 1 during mid-ebb tides between October 2020 and September 2021

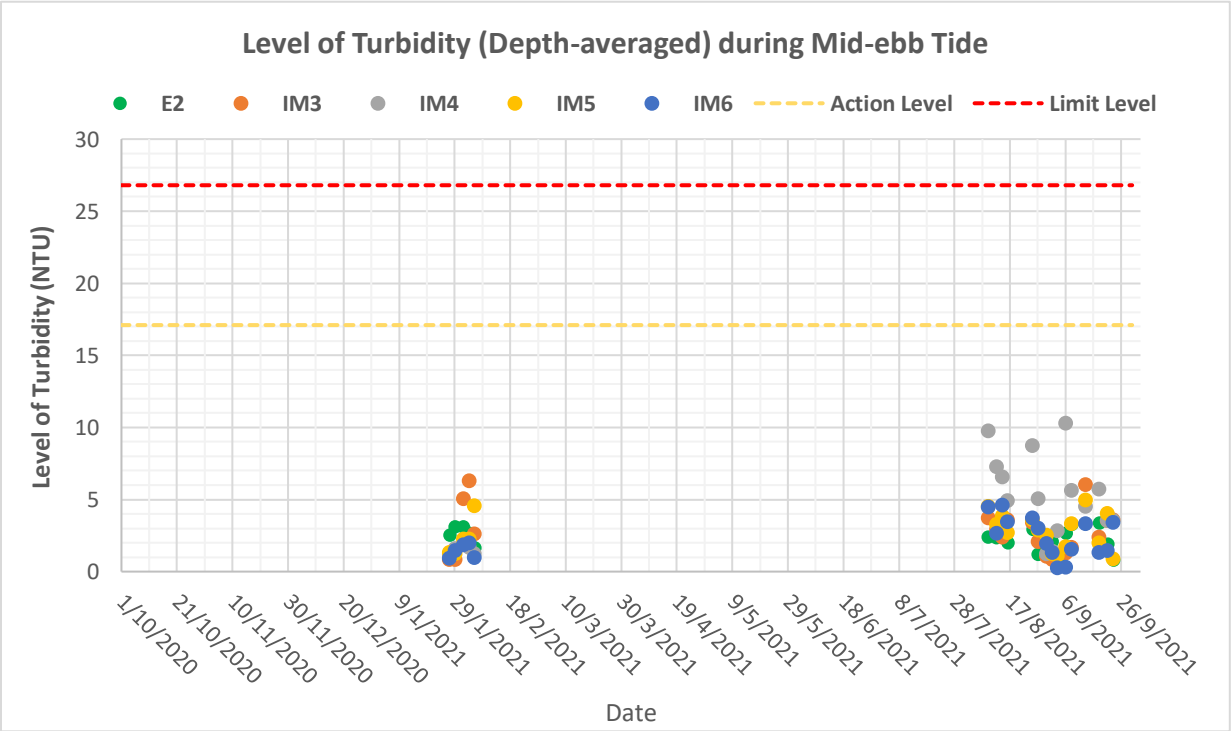


Figure F3b: Levels of Depth-averaged Turbidity (NTU) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2020 and September 2021

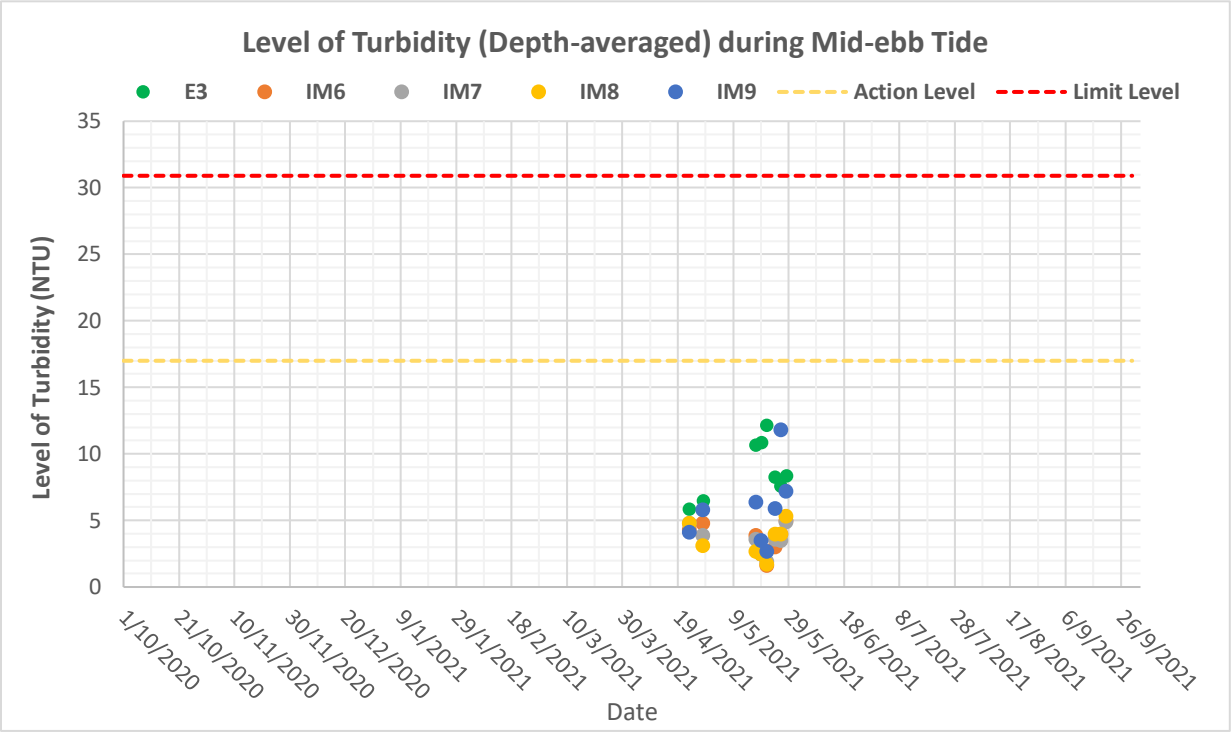


Figure F3c: Levels of Depth-averaged Turbidity (NTU) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2020 and September 2021

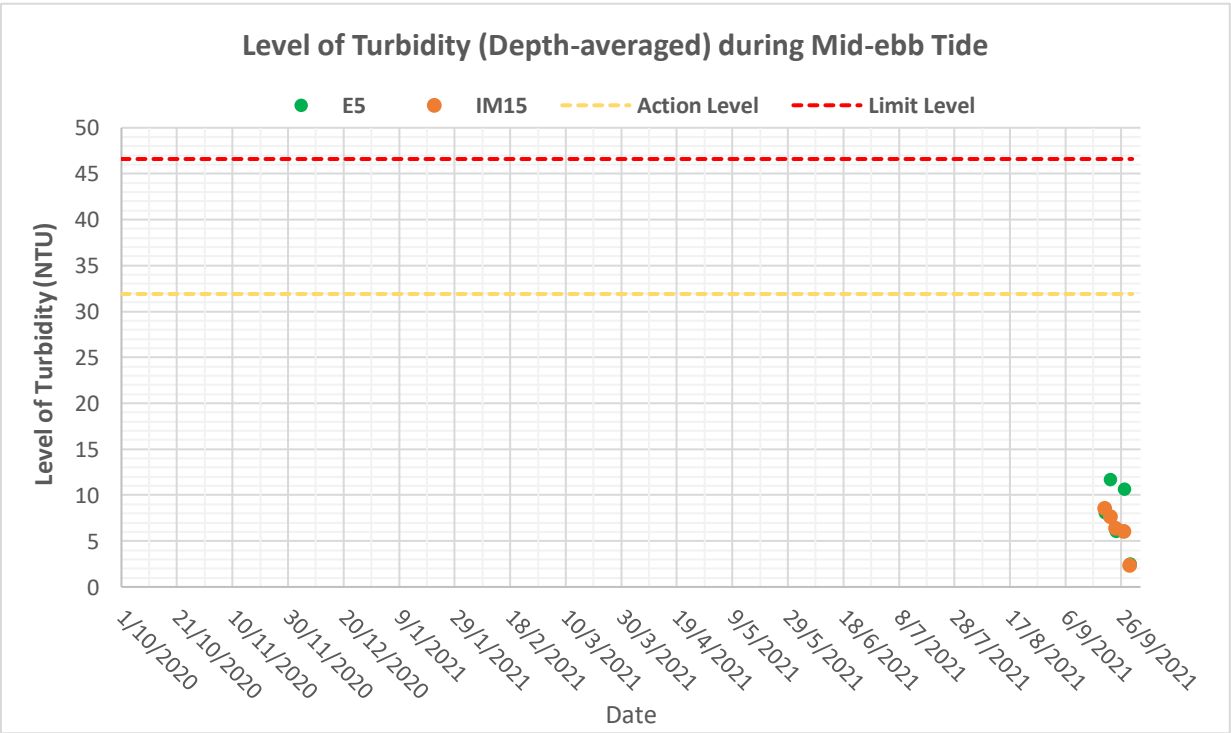


Figure F3d: Levels of Depth-averaged Turbidity (NTU) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2020 and September 2021

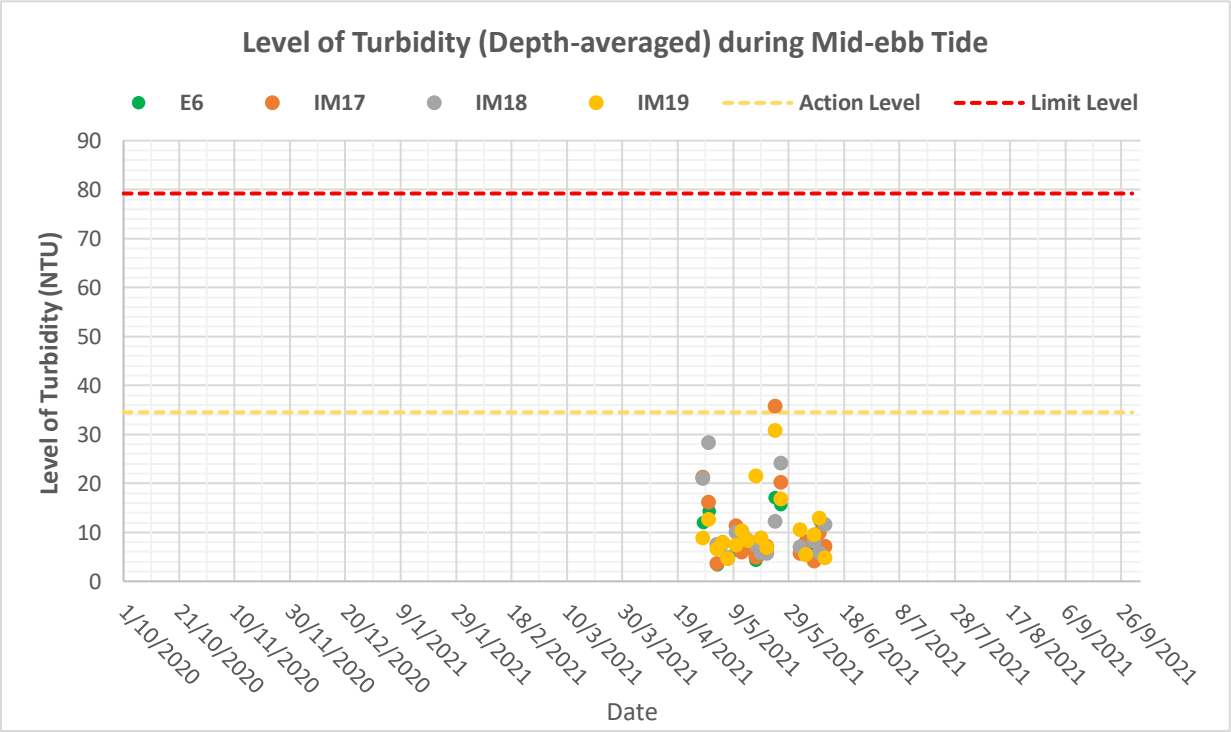


Figure F3e: Levels of Depth-averaged Turbidity (NTU) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2020 and September 2021

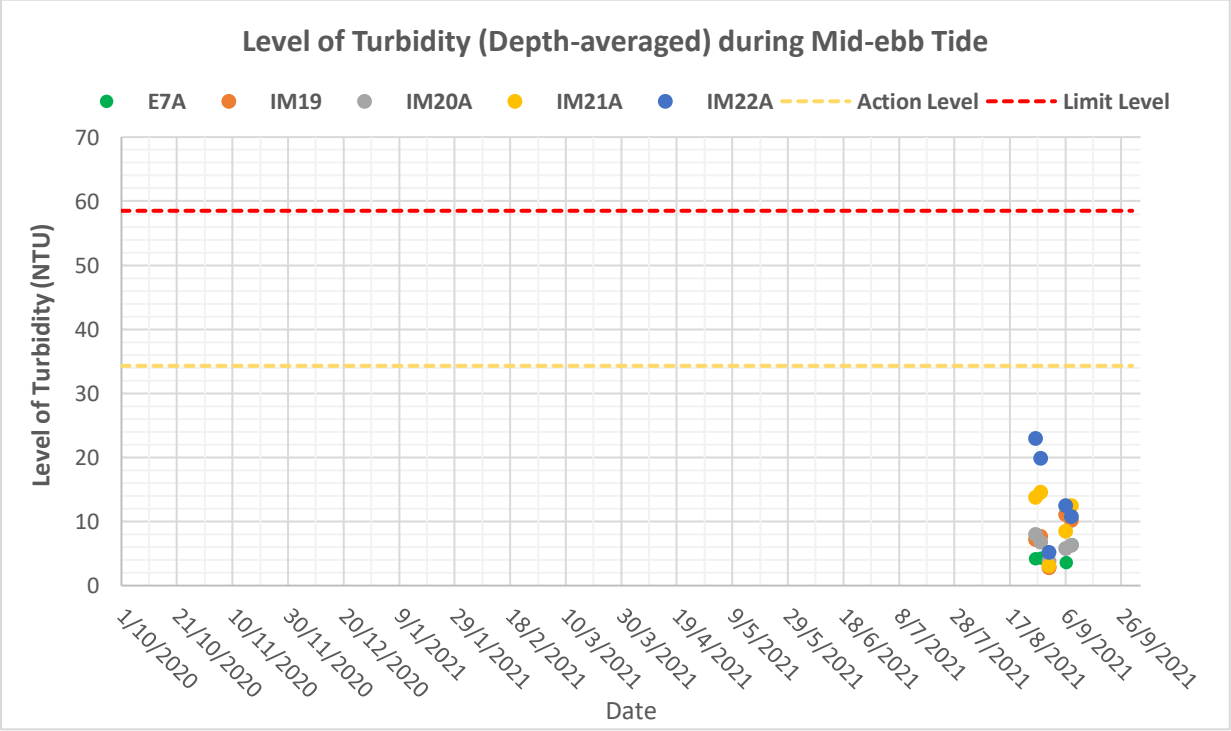


Figure F3f: Levels of Depth-averaged Turbidity (NTU) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2020 and September 2021

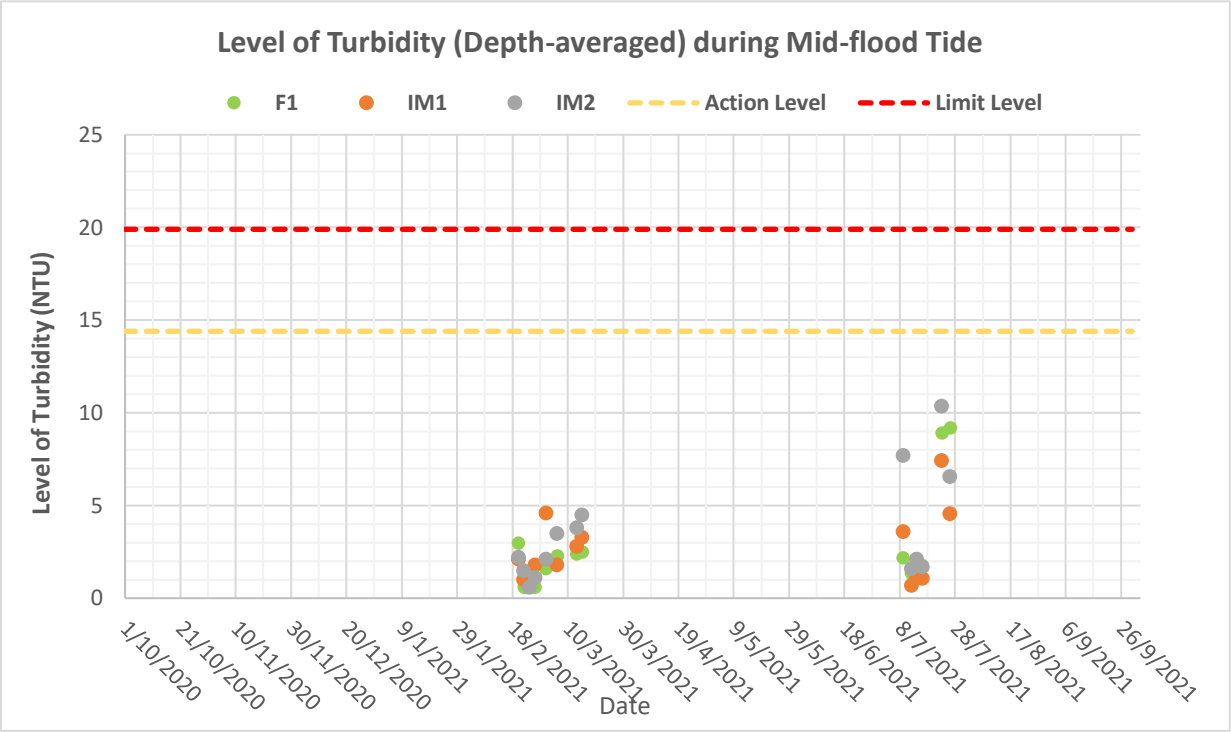


Figure F3g: Levels of Depth-averaged Turbidity (NTU) at control station (F1) and impact stations (IM1-IM2) under Group 1 during mid-flood tides between October 2020 and September 2021

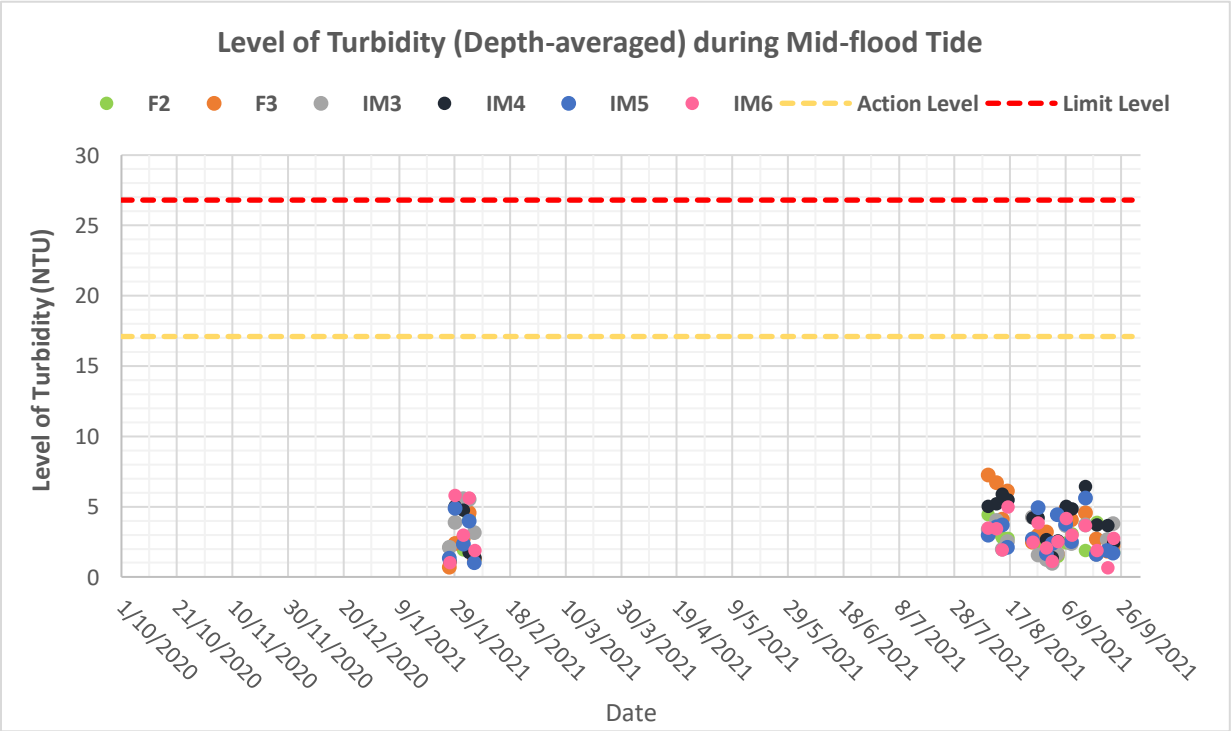


Figure F3h: Levels of Depth-averaged Turbidity (NTU) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2020 and September 2021

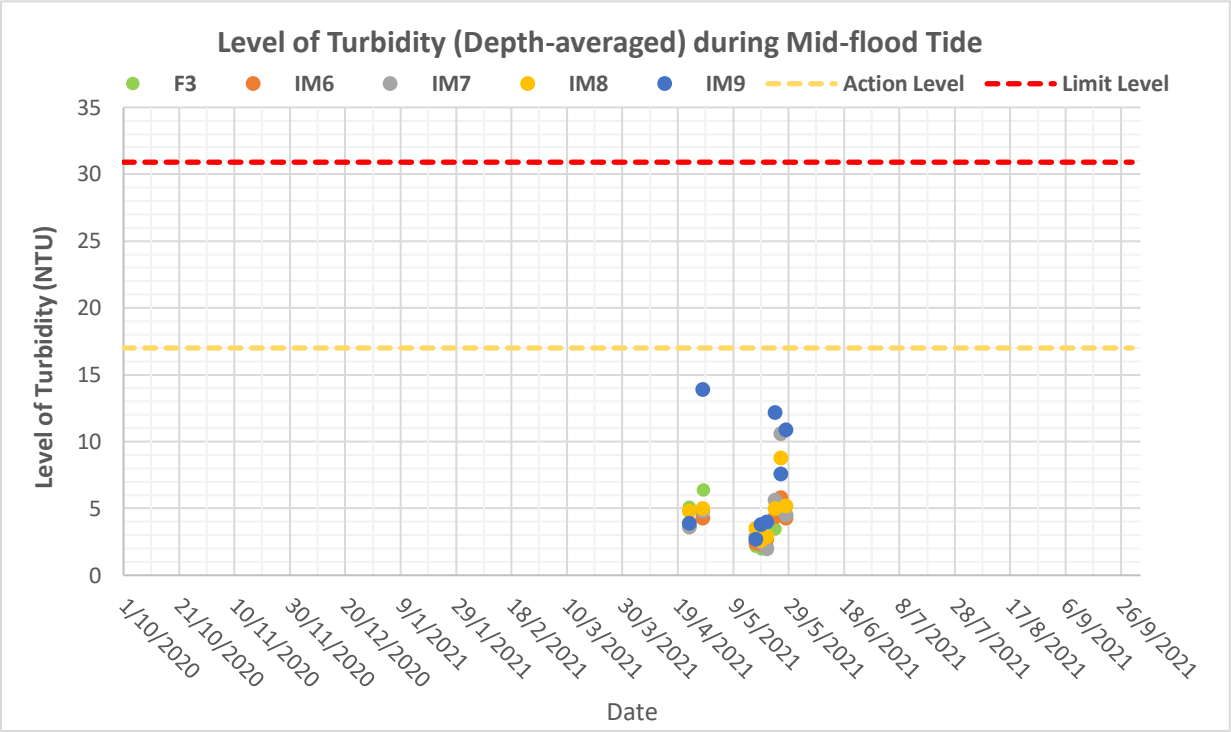


Figure F3i: Levels of Depth-averaged Turbidity (NTU) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2020 and September 2021

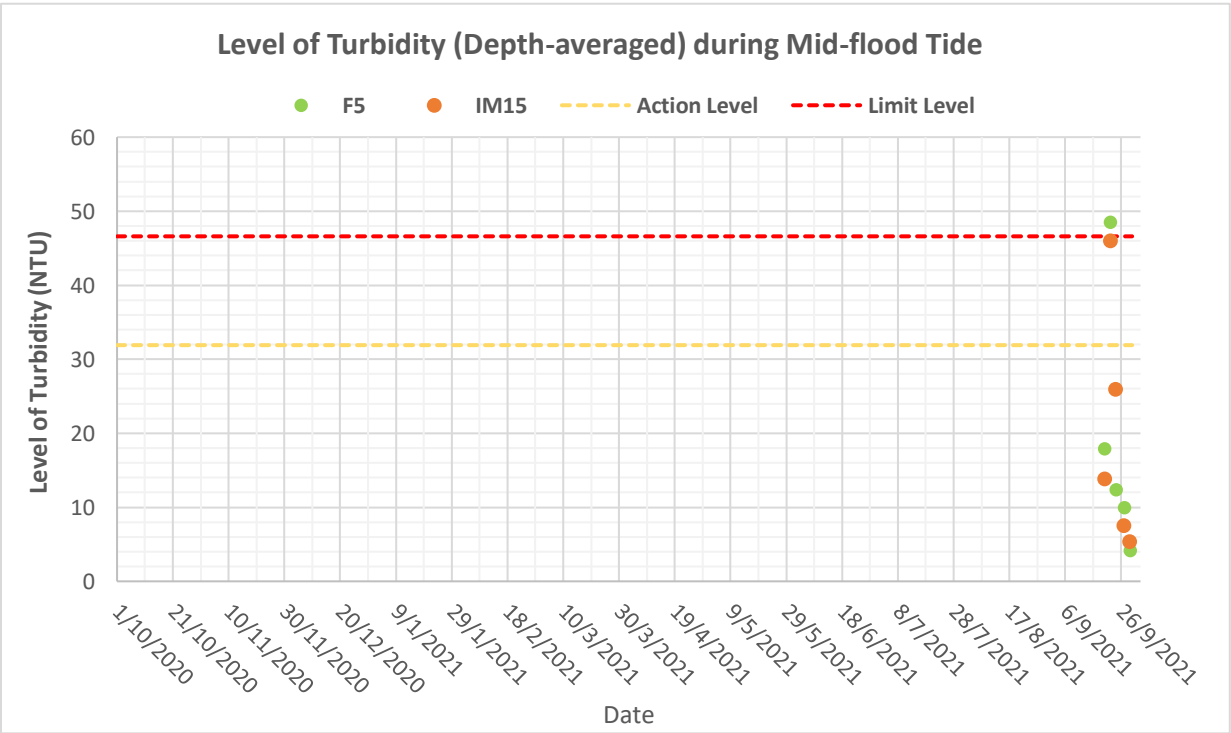


Figure F3j: Levels of Depth-averaged Turbidity (NTU) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2020 and September 2021

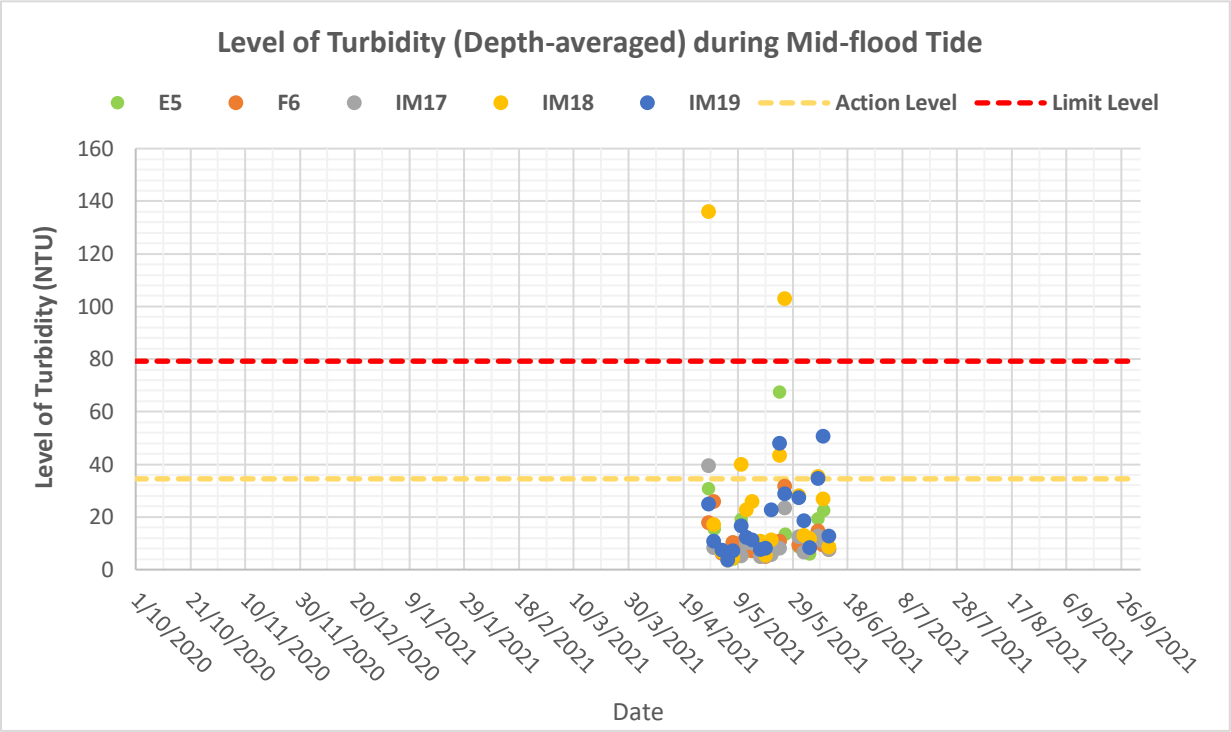


Figure F3k: Levels of Depth-averaged Turbidity (NTU) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2020 and September 2021

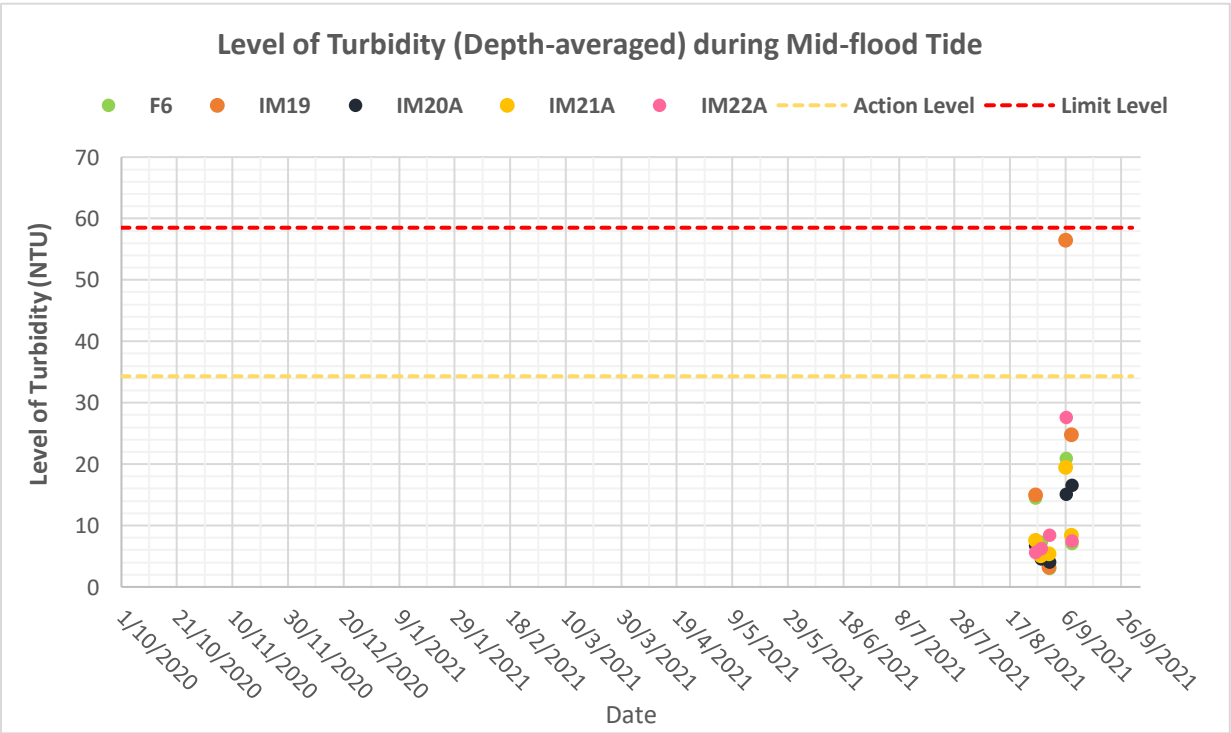


Figure F3l: Levels of Depth-averaged Turbidity (NTU) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2020 and September 2021

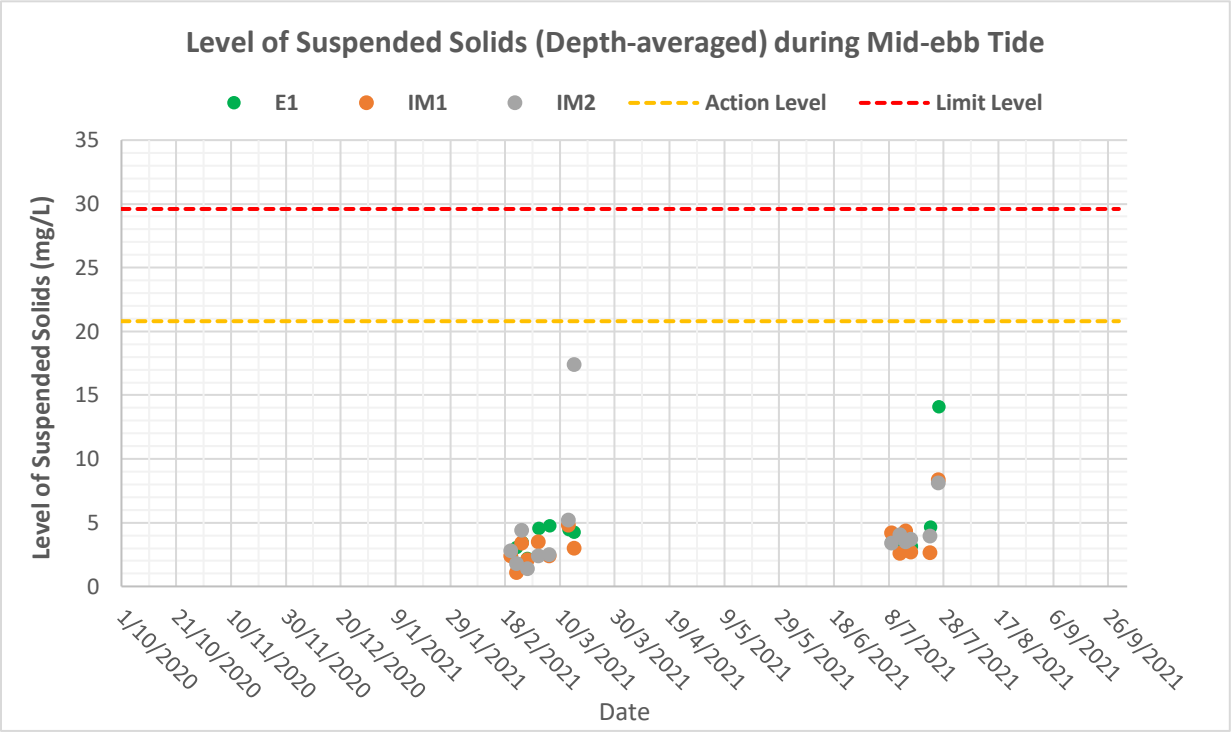


Figure F4a: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E1) and impact stations (IM1-IM2) under Group 1 during mid-ebb tides between October 2020 and September 2021

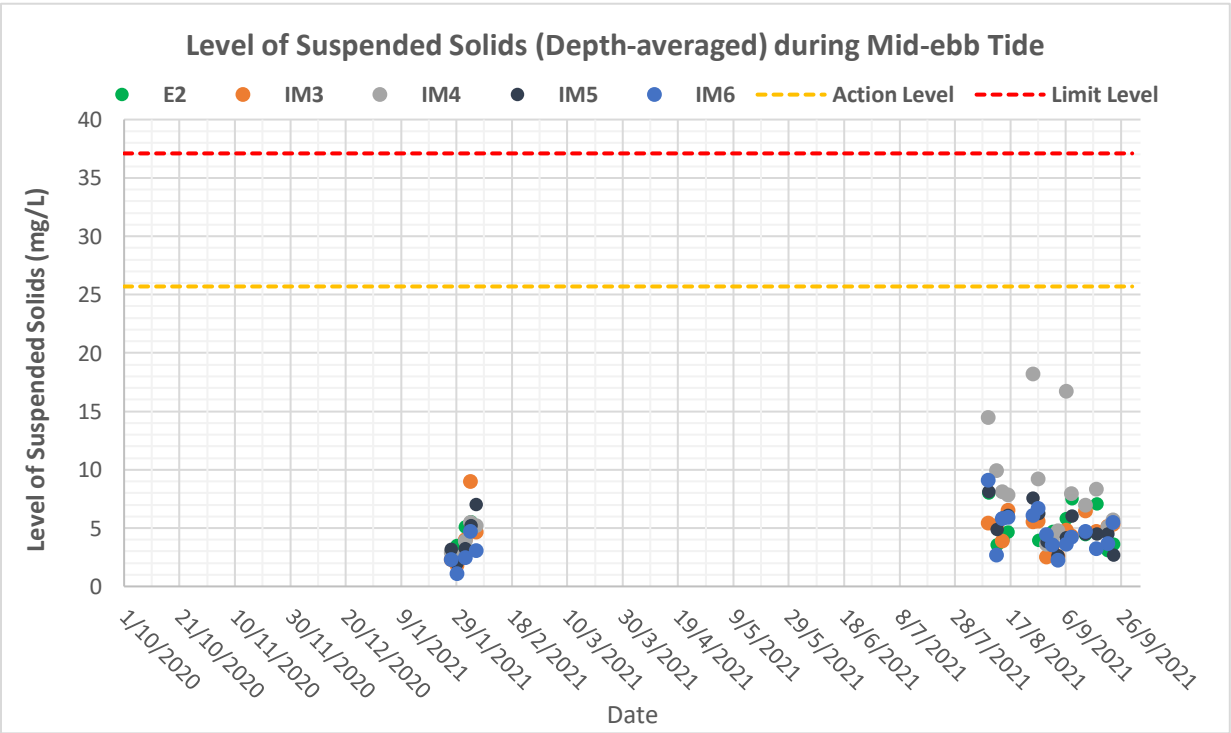


Figure F4b: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2020 and September 2021

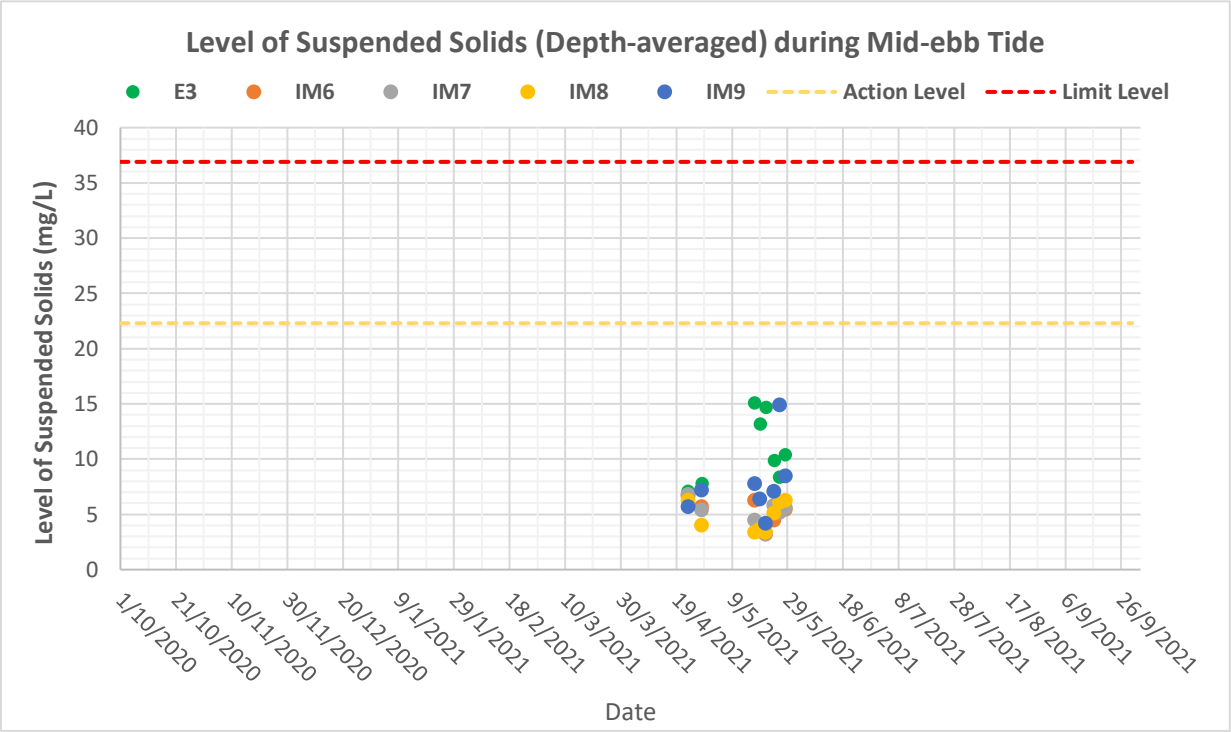


Figure F4c: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2020 and September 2021

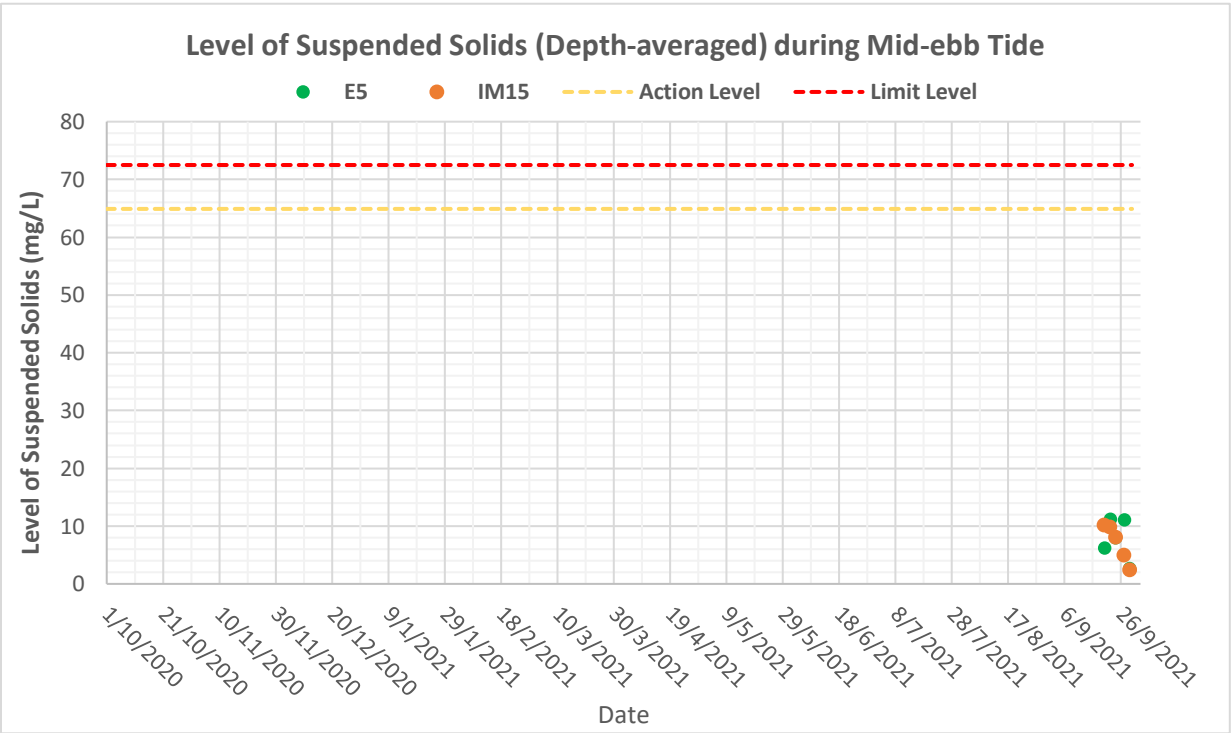


Figure F4d: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2020 and September 2021

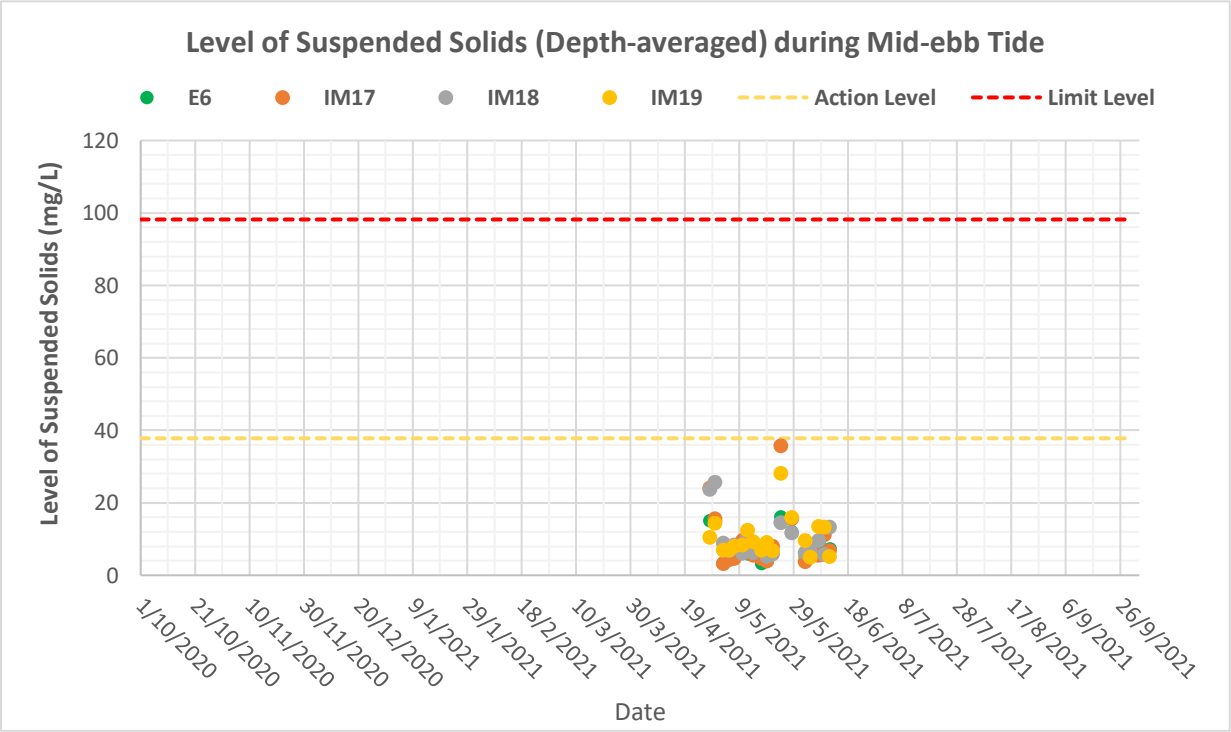


Figure F4e: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2020 and September 2021

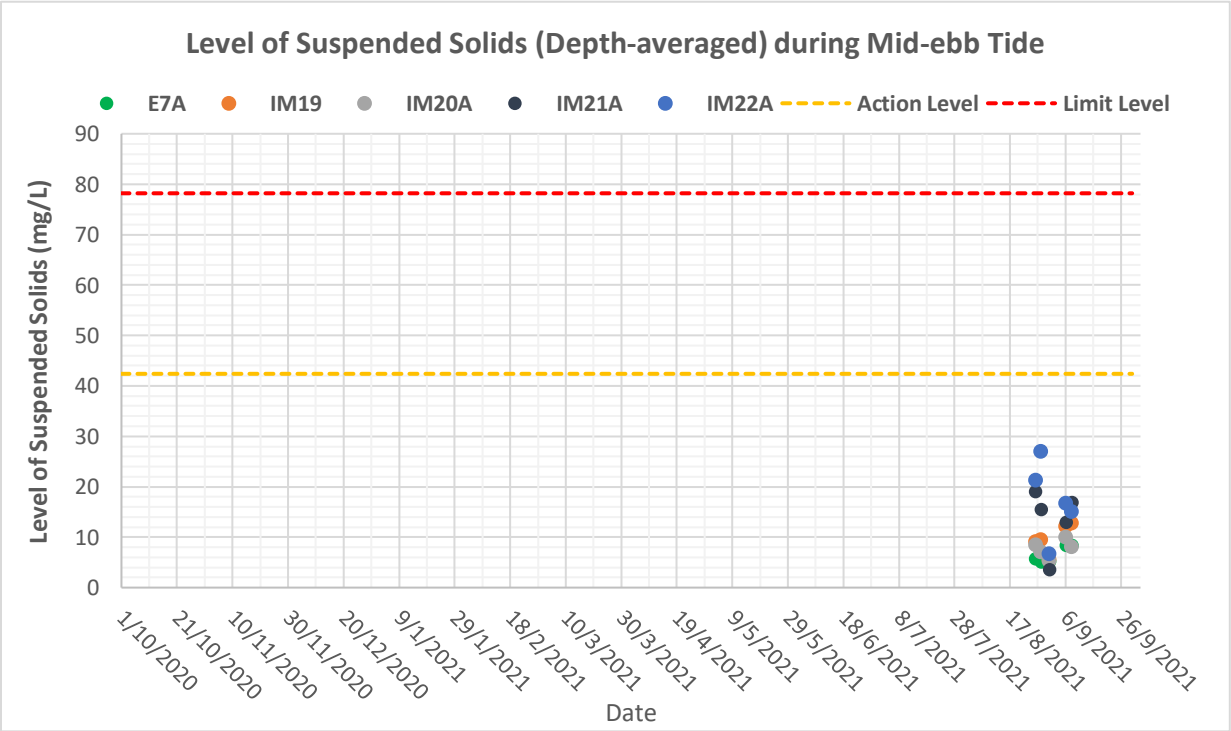


Figure F4f: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2020 and September 2021

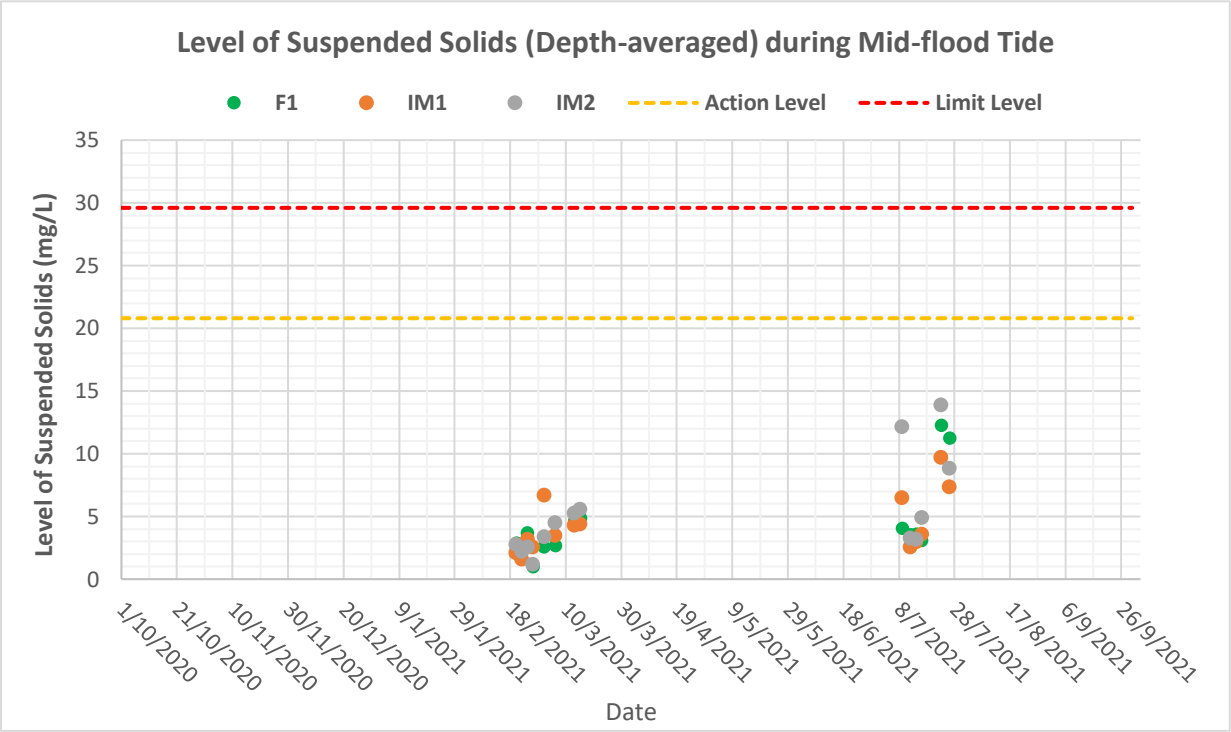


Figure F4g: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F1) and impact stations (IM1-IM2) under Group 1 during mid-flood tides between October 2020 and September 2021

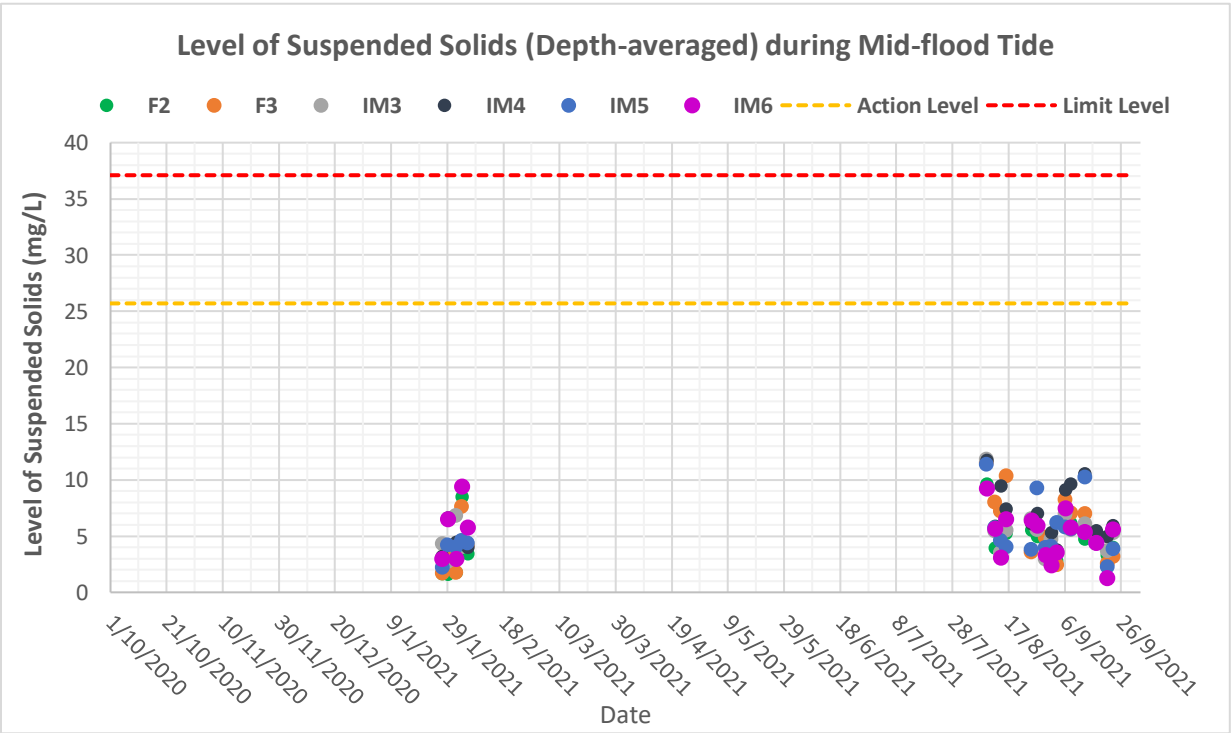


Figure F4h: Levels of Depth-averaged Suspended Solids (mg/L) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2020 and September 2021

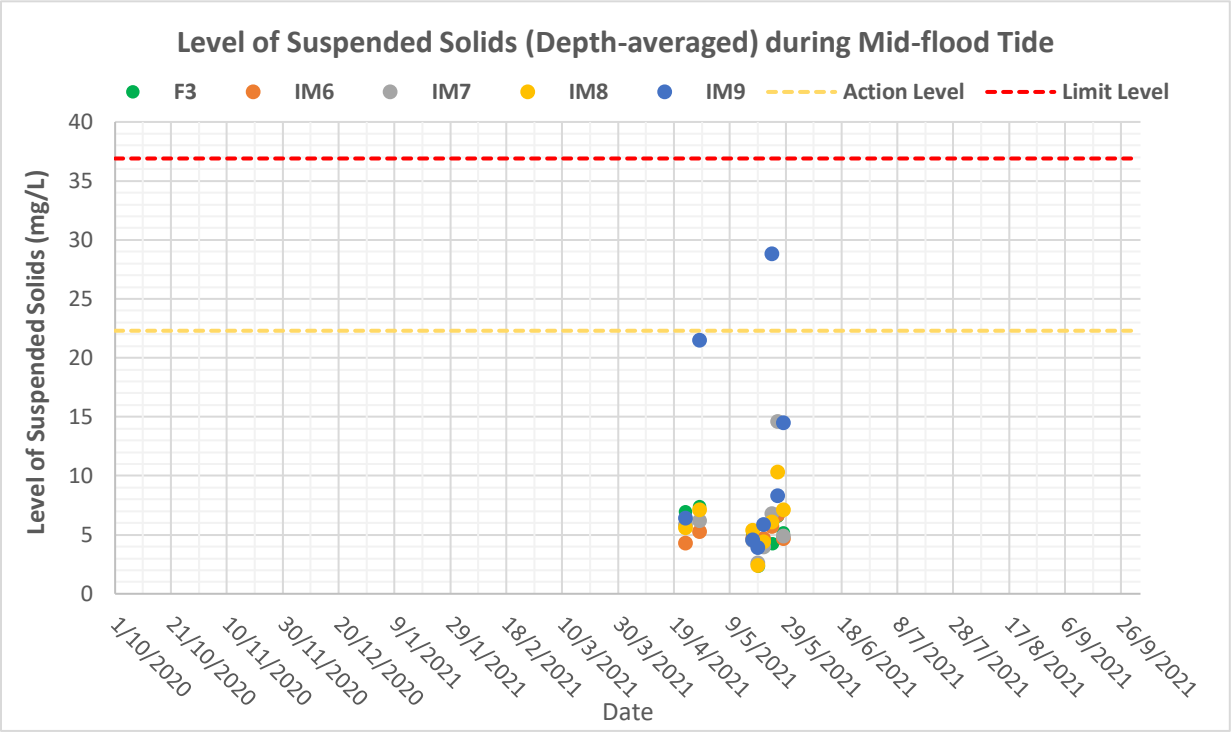


Figure F4i: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2020 and September 2021

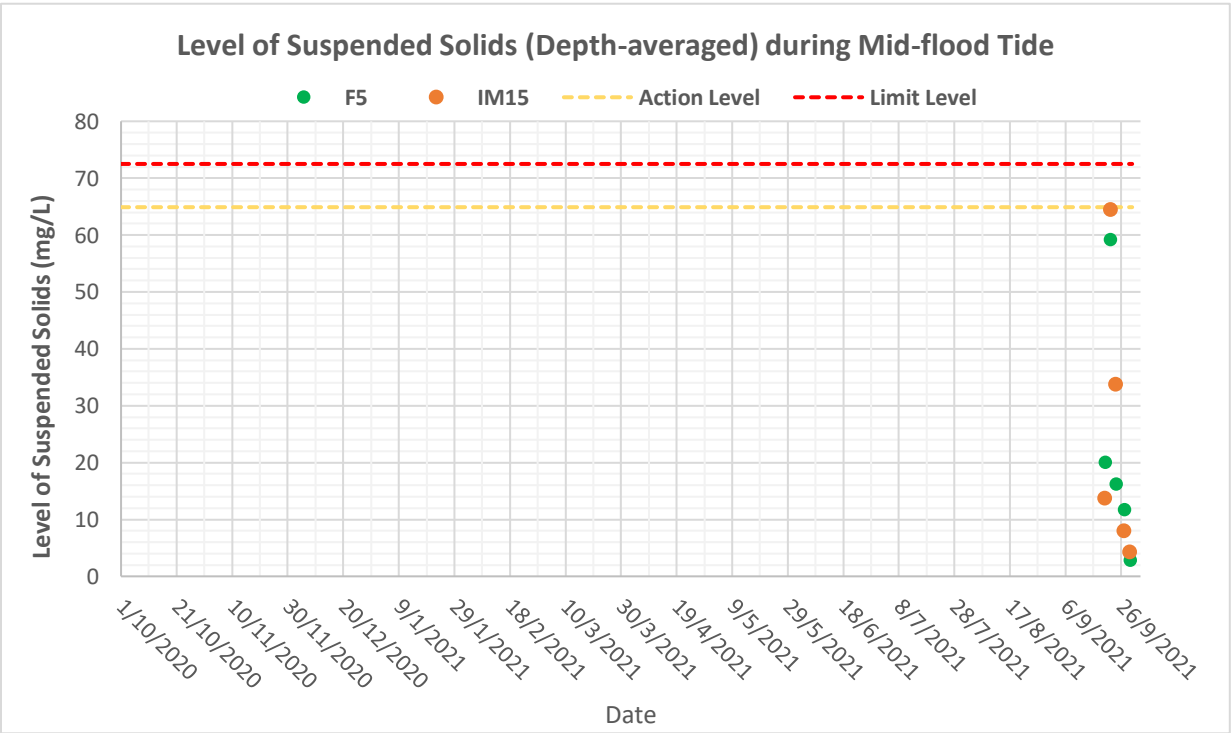


Figure F4j: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2020 and September 2021

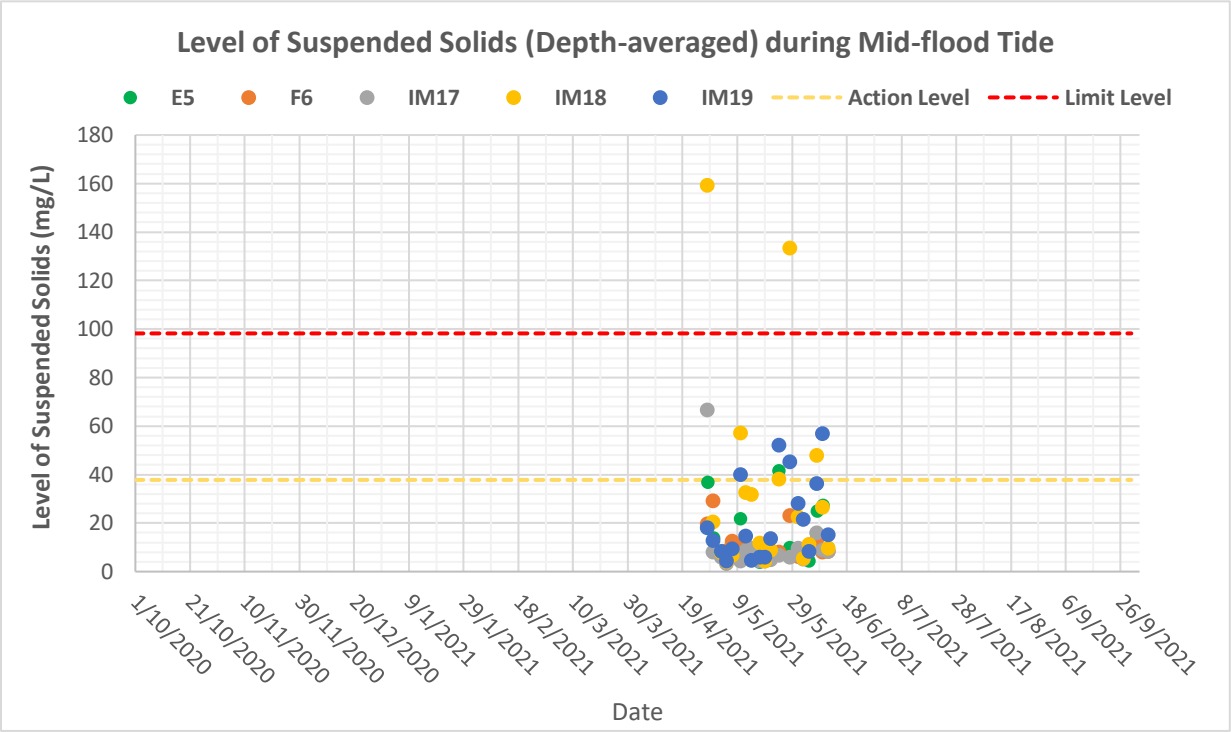


Figure F4k: Levels of Depth-averaged Suspended Solids (mg/L) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2020 and September 2021

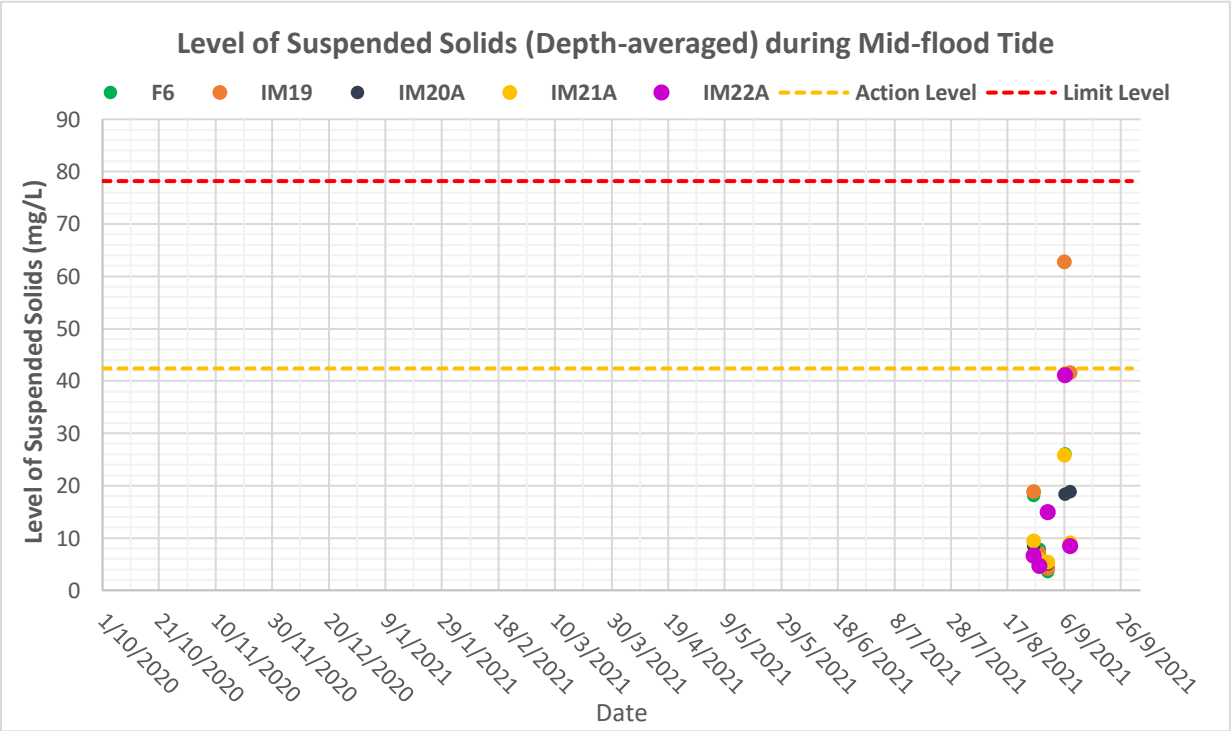


Figure F4l: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2020 and September 2021

Annotations:

- Key marine-based activities of the Project undertaken for construction of BPPS Pipeline included:
  i. pre-trenching works in terms of dredging operation in the vicinity of marine water quality monitoring stations under Group 3 on 24 April and 16 to 28 May 2021;
  ii. pre-trenching works in terms of dredging operation in the vicinity of marine water quality monitoring stations under Group 7 on 28 to 20 April, 1 to 26, 30, 31 May and 1 to 12 June 2021;
  iii. pre-trenching works in terms of dredging operation in the vicinity of marine water quality monitoring stations under Group 8 on 26 to 31 August, 1, 8 and 9 September 2021; and
  iv. post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 5 on 18 to 30 September 2021.
- Key marine-based activities of the Project undertaken for construction of LPS Pipeline included:
  i. pre-trenching works in terms of dredging operation in the vicinity of marine water quality monitoring stations under Group 2 on 1, 2 and 4 February 2021;
  ii. de-burial works by mass flow excavator in the vicinity of marine water quality monitoring stations under Group 1 on 23, 26, 27 February, 5, 6, 13, 14 and 15 March 2021.
  iii. post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 1 on 5, 6, 8 to 18 and 22 to 26 July 2021 (1); and
  iv. post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 2 on 8 to 16, 24 to 31 August, 1 to 8, 12 to 14 and 17 to 23 September 2021.
- Marine water quality monitoring was conducted at monitoring stations under Group 1 on 20, 22, 24, 26 February, 2, 6, 13, 15 March, 9, 12, 14, 16, 23 and 26 July 2021.
- Marine water quality monitoring was conducted at monitoring stations under Group 2 on 27, 29 January, 1, 3, 5 February, 9, 12, 14, 16, 25, 27, 30 August, 1, 3, 6, 8, 13, 17, 21 and 23 September 2021 (2).
- Marine water quality monitoring was conducted at monitoring stations under Group 3 on 23, 28 (3) April, 17, 19, 21, 24, 26 and 28 May 2021.
- Marine water quality monitoring was conducted at monitoring stations under Group 5 on 20, 22, 24, 27 and 29 September 2021.
- Marine water quality monitoring was conducted at monitoring stations under Group 7 on 28, 30 April, 3, 5, 7, 10, 12, 14, 17, 19, 21, 24, 26, 31 (4) May, 2, 4, 7, 9 and 11 June 2021.
- Marine water quality monitoring was conducted at monitoring stations under Group 8 on 26, 28, 31 August, 6 and 8 September 2021 (5).
- Weather conditions during the monitoring period ranged from fine to cloudy, with sea conditions ranged from calm to moderate. Detailed meteorological conditions can be referred to *Annex G of the associated Monthly EM&A Reports* for the reporting period.
- No special phenomena and/or other factors which might affect the monitoring results were observed and recorded during the monitoring period.

Notes:

(1) Preparation works for marine jetting operation (e.g. installation of cage-type silt curtain, anchoring activities, etc.) were undertaken on 5 and 6 July 2021 while marine jetting operation commenced since 8 July 2021.

(2) Monitoring station, IM6, was occupied by a crane barge during the monitoring events since 27 August 2021. Therefore, the monitoring station was shifted to the nearest practicable location.

(3) Marine water quality monitoring was conducted under Group 3 on 28 April 2021 as a follow-up monitoring due to the cancellation of monitoring scheduled on 26 April 2021 for marine dredging operation at Cable Sterile Corridor for BPPS Pipeline.

(4) Marine water quality monitoring during ebb tide on 31 May 2021 was cancelled due to the adverse weather at the time of monitoring event.

(5) Monitoring stations, IM20A and IM21A, were occupied by oyster rafts and crane barge, respectively, during the monitoring events since 26 August 2021. Therefore, the monitoring stations were shifted to the nearest practicable locations.

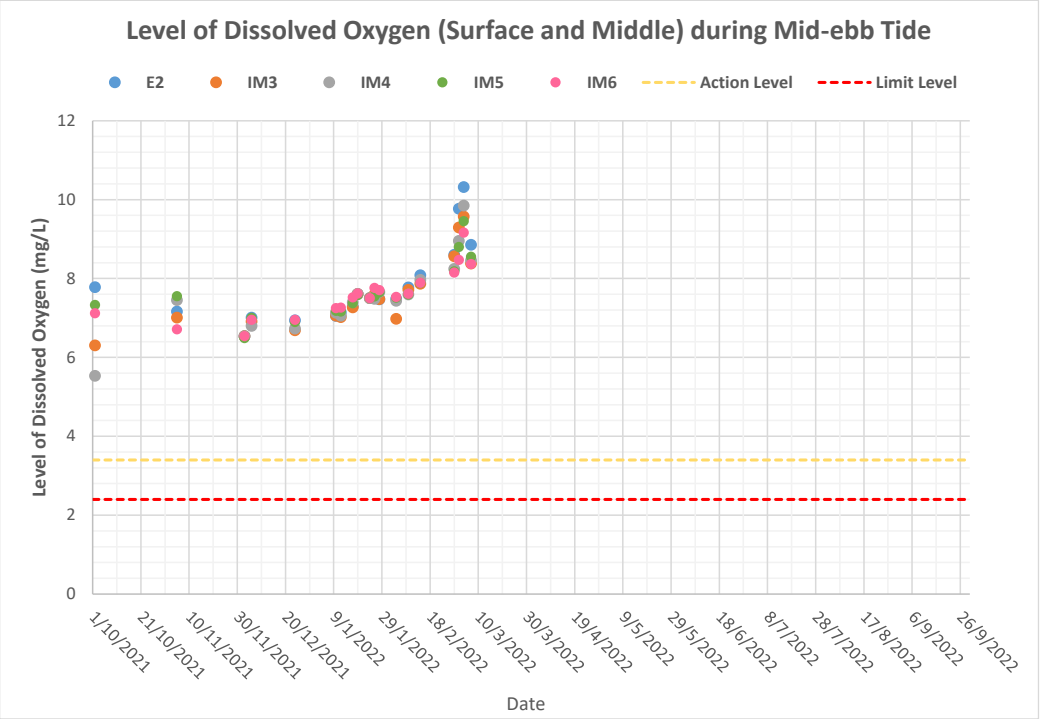


Figure F5a: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2021 and September 2022

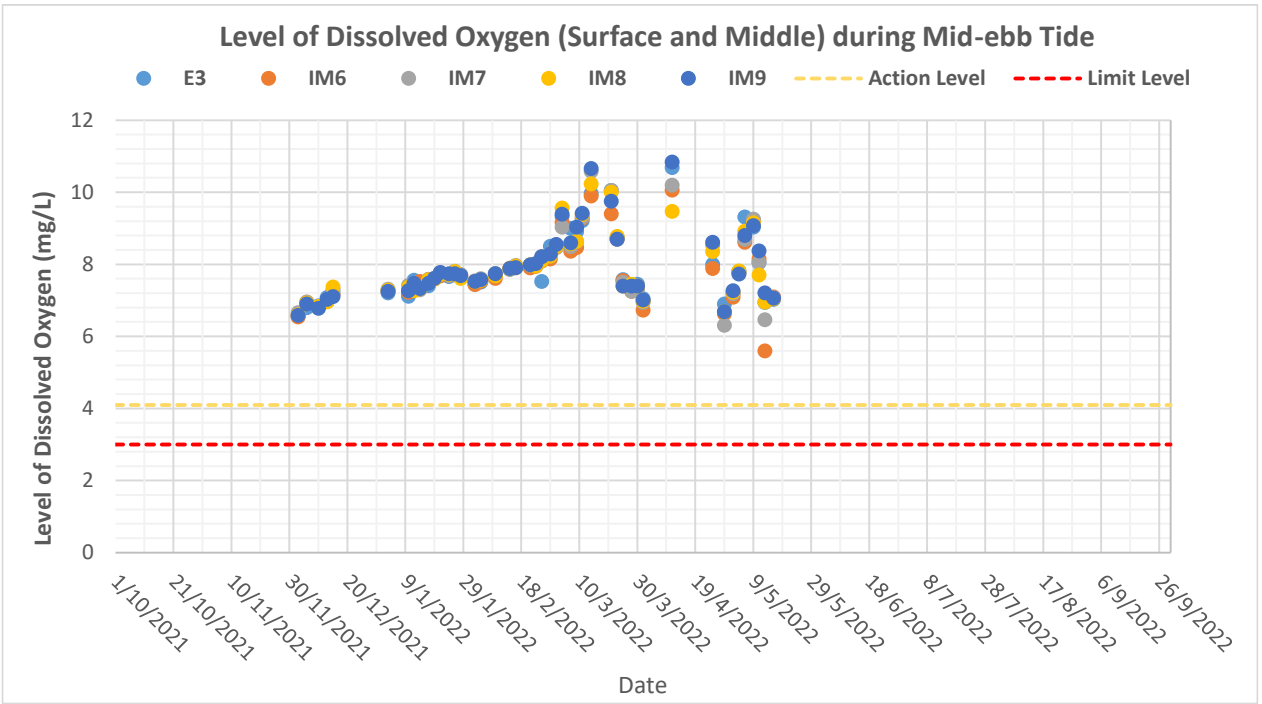


Figure F5b: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2021 and September 2022

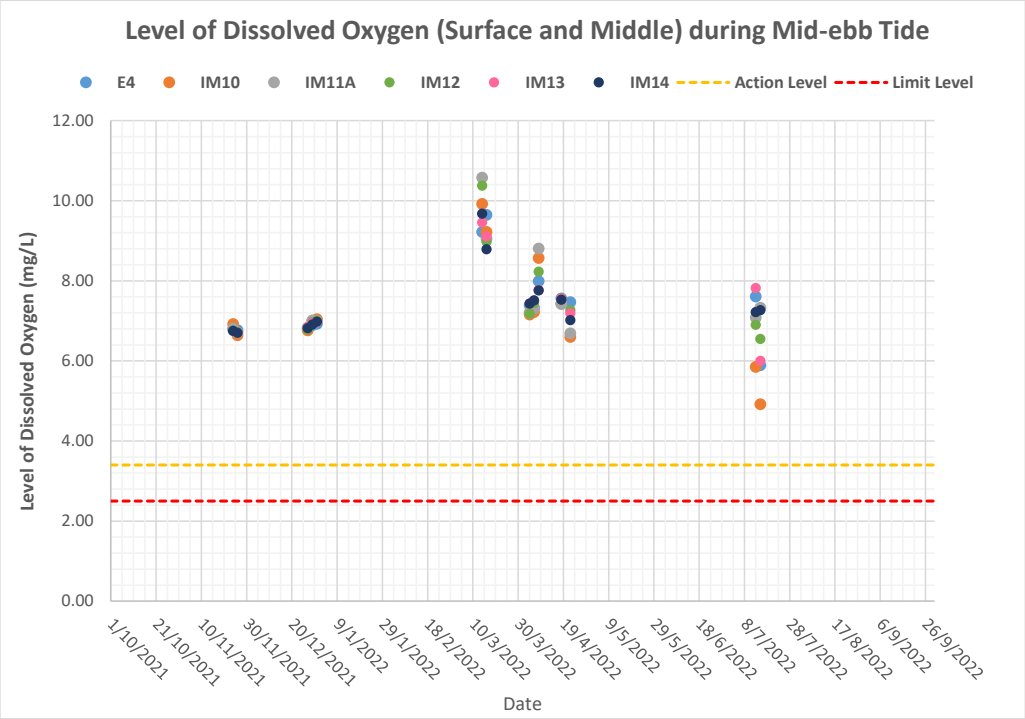


Figure F5c: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E4) and impact stations (IM10-IM14) under Group 4 during mid-ebb tides between October 2021 and September 2022

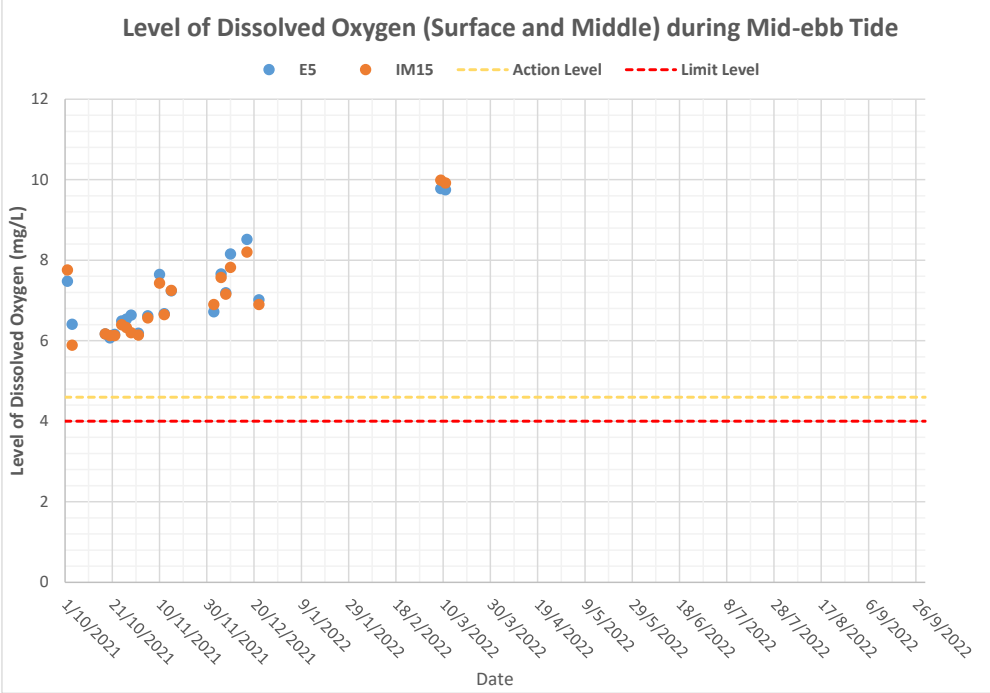


Figure F5d: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2021 and September 2022

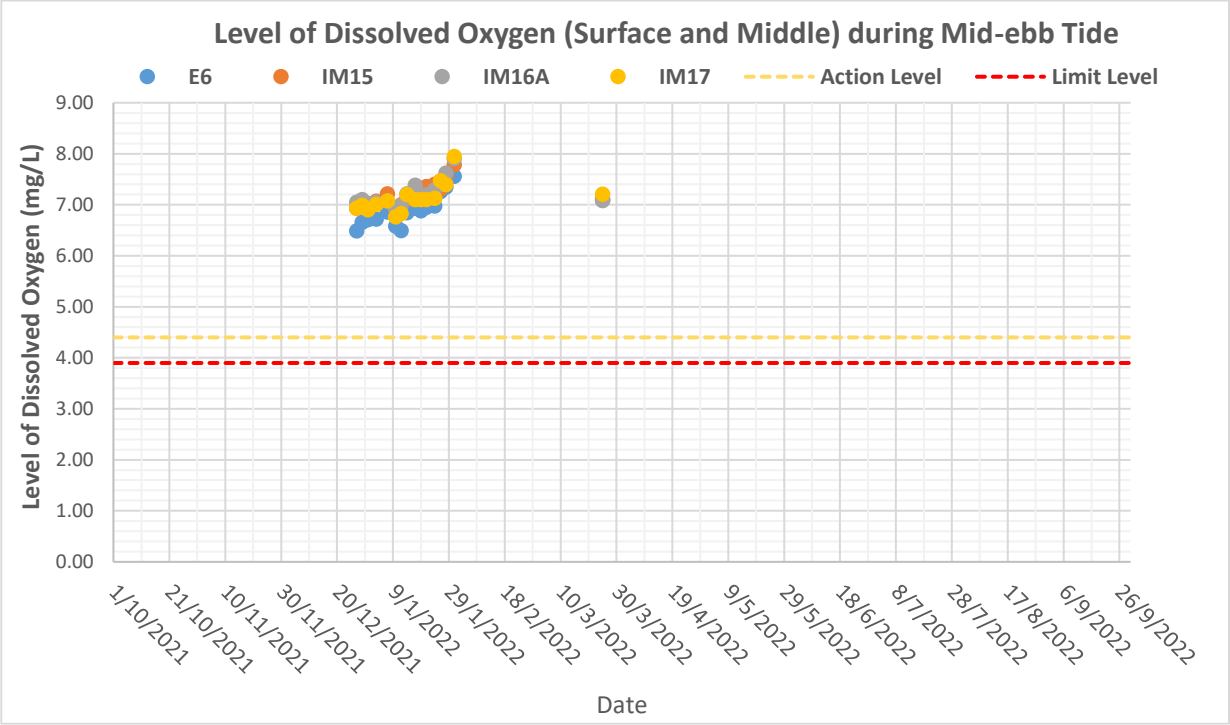


Figure F5e: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E6) and impact stations (IM15-IM17) under Group 6 during mid-ebb tides between October 2021 and September 2022

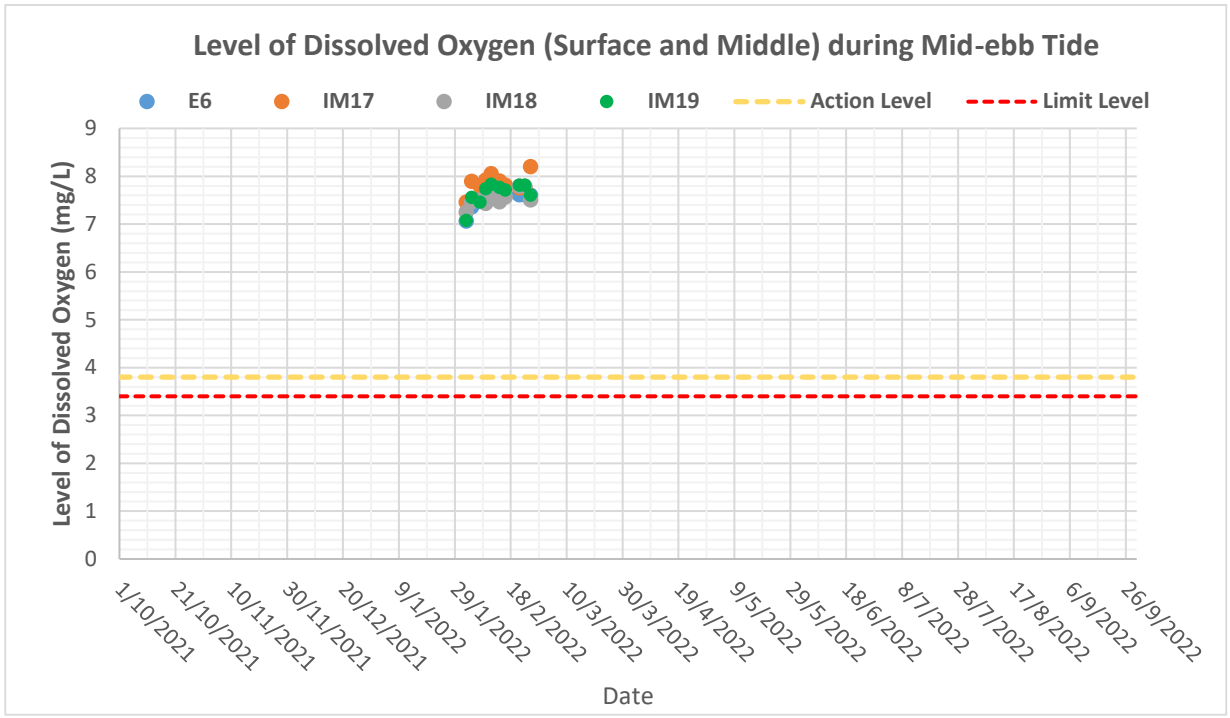


Figure F5f: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2021 and September 2022

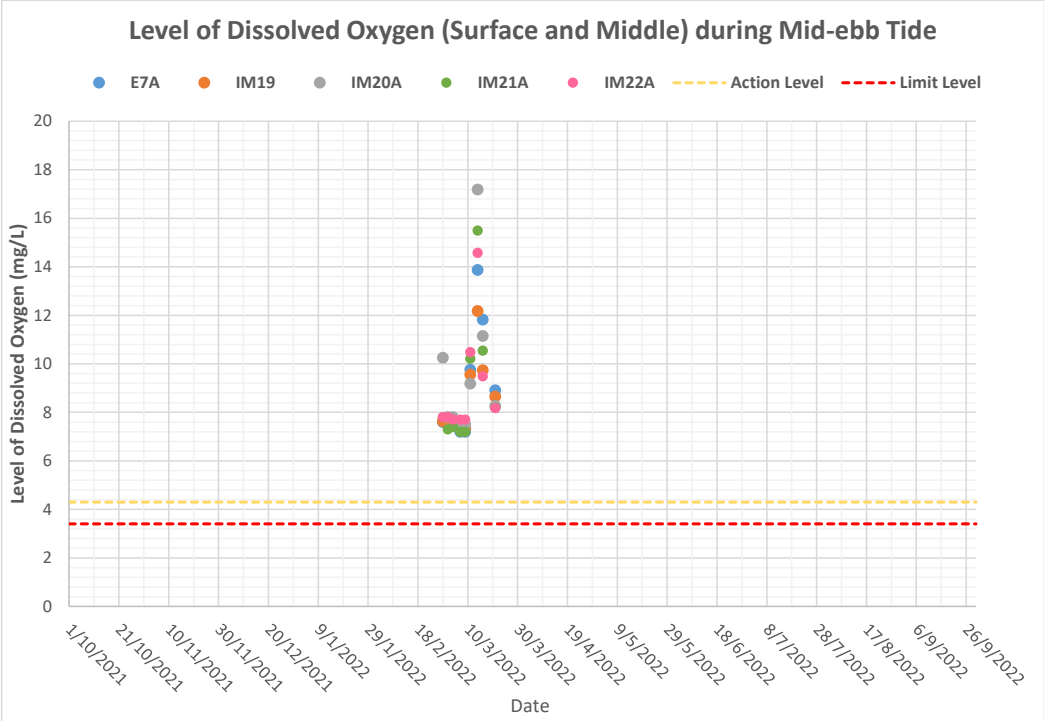


Figure F5g: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2021 and September 2022

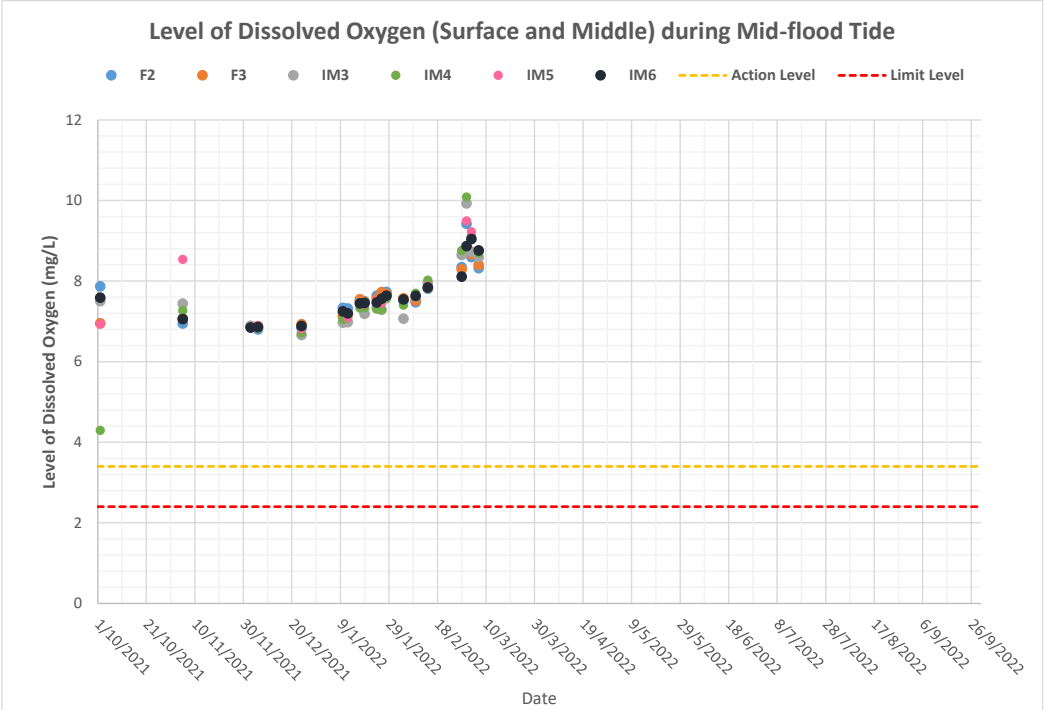


Figure F5h: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2021 and September 2022

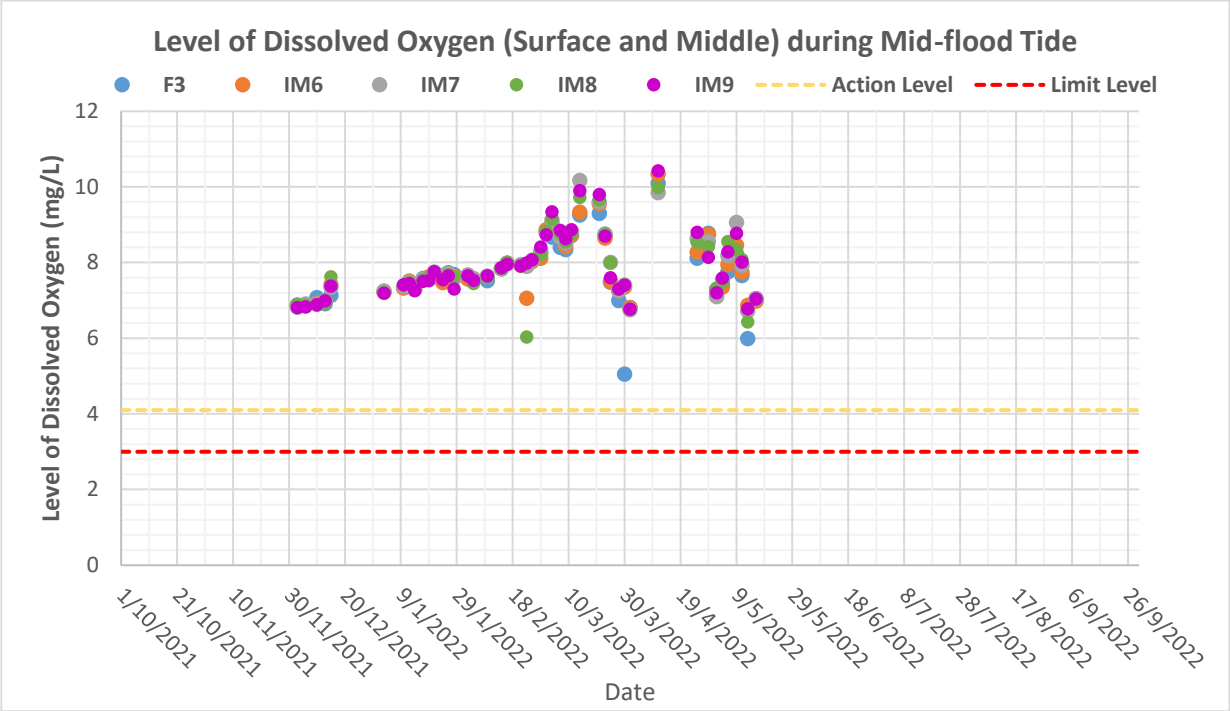


Figure F5i: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2021 and September 2022

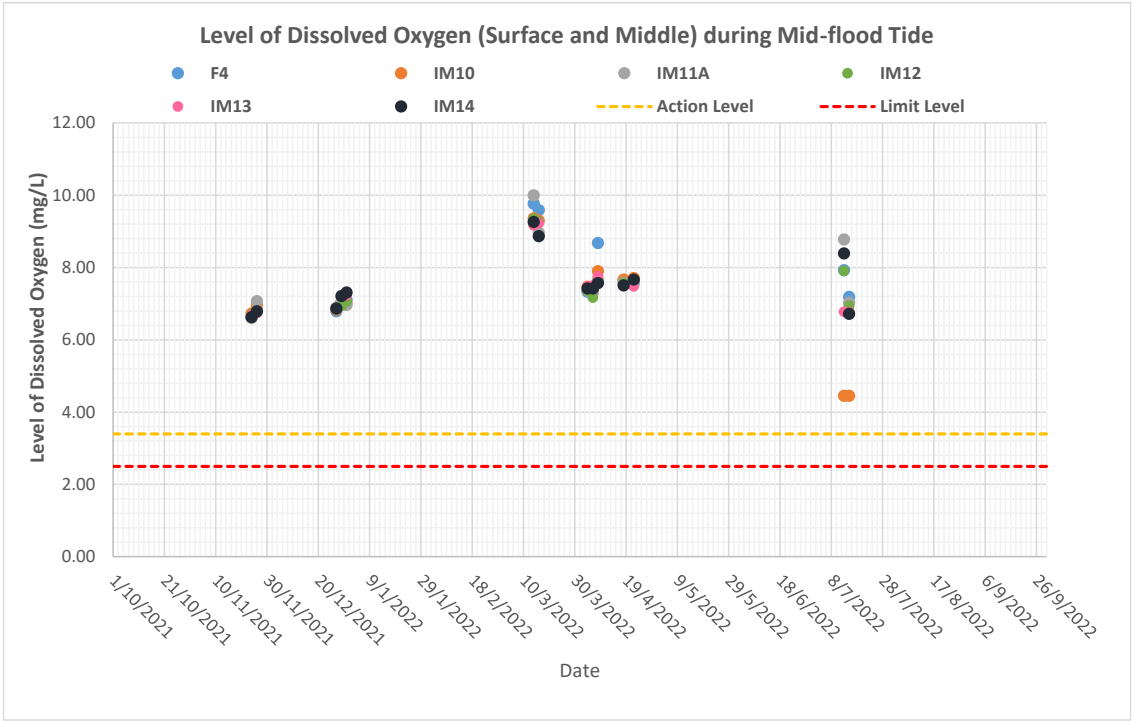


Figure F5j: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F4) and impact stations (IM10-IM14) under Group 4 during mid-flood tides between October 2021 and September 2022

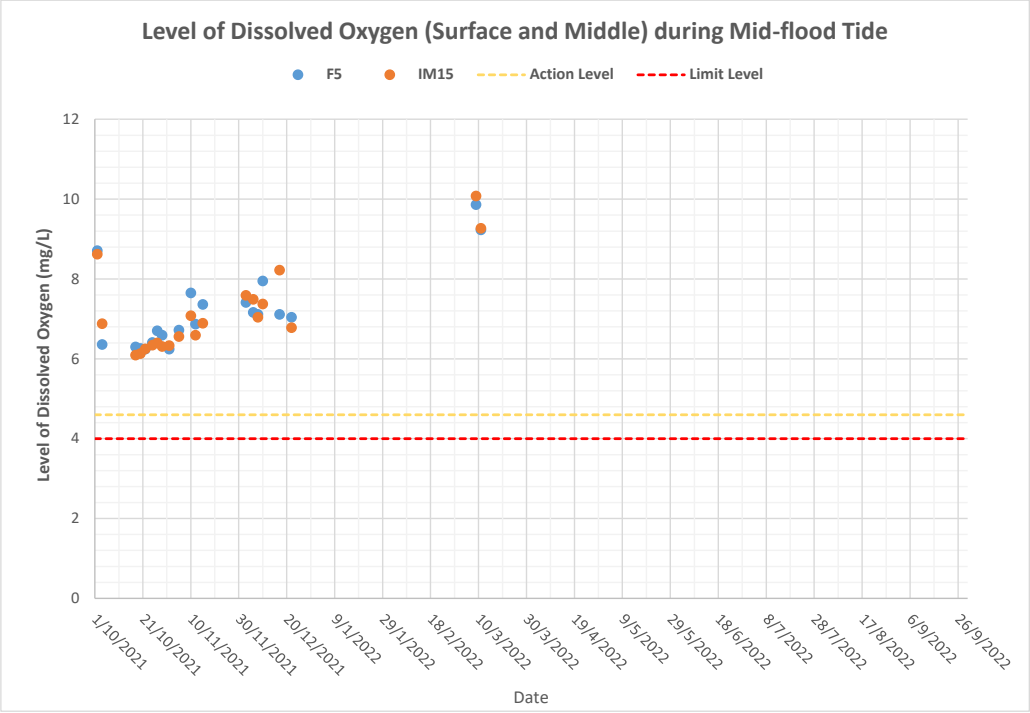


Figure F5k: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2021 and September 2022

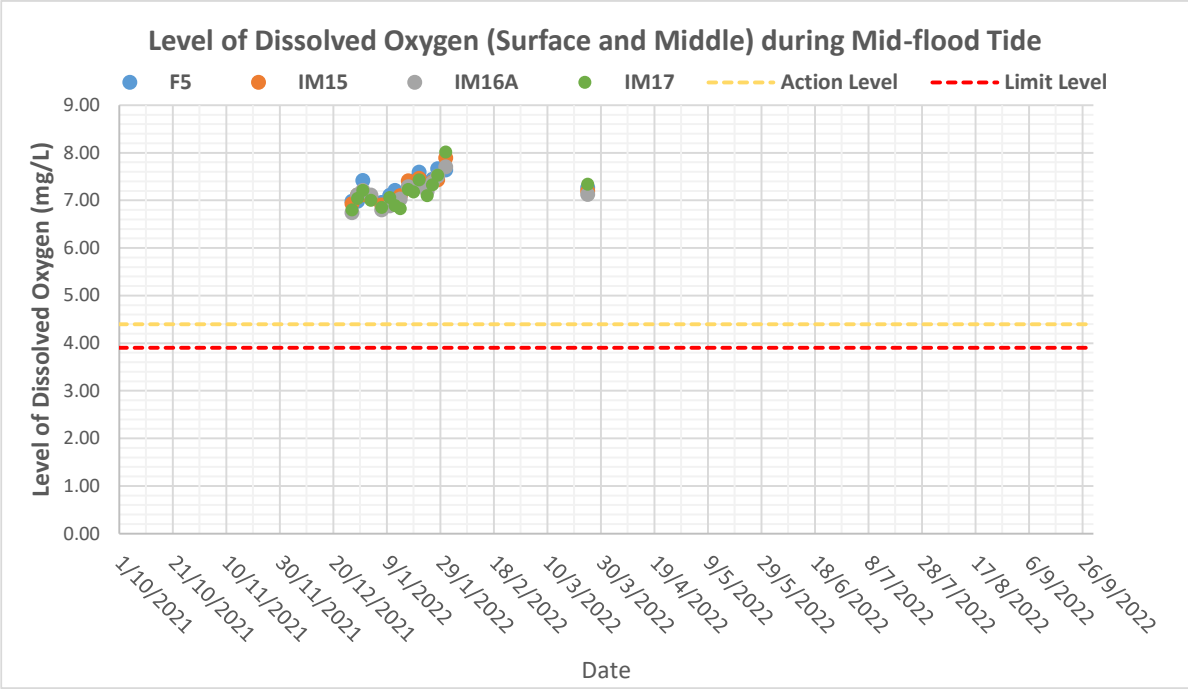


Figure F5l: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F5) and impact station (IM15) under Group 6 during mid-flood tides between October 2021 and September 2022

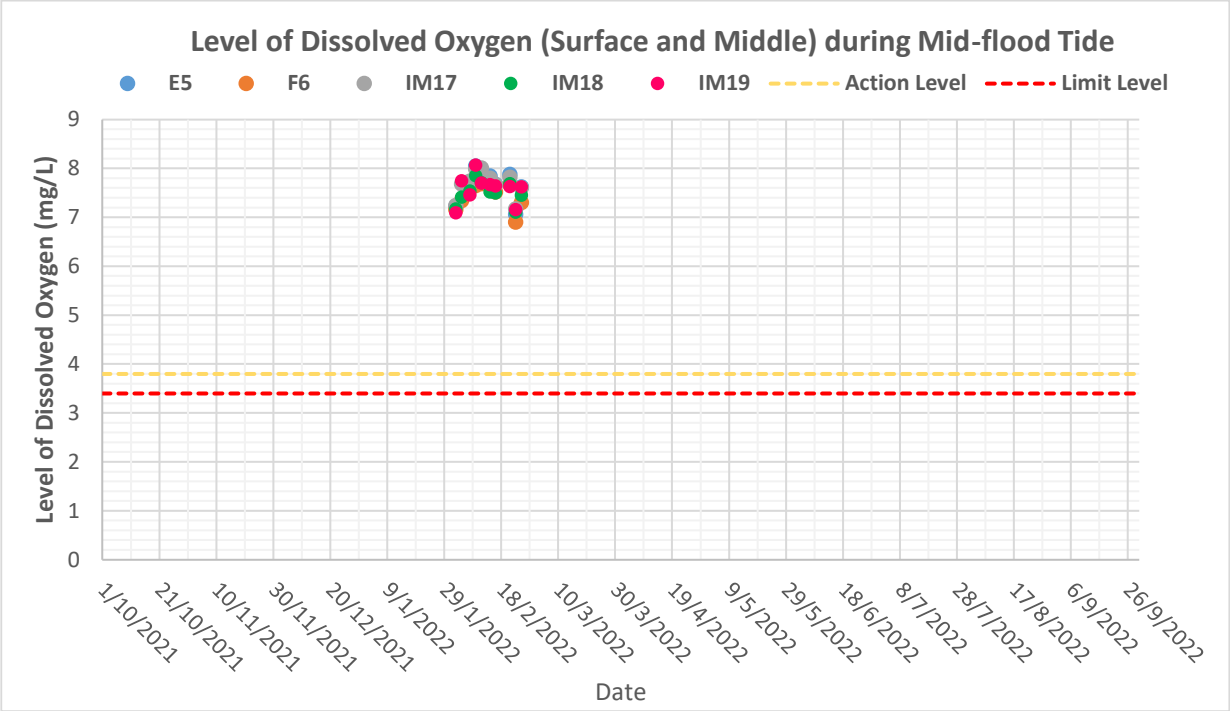


Figure F5m: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2021 and September 2022

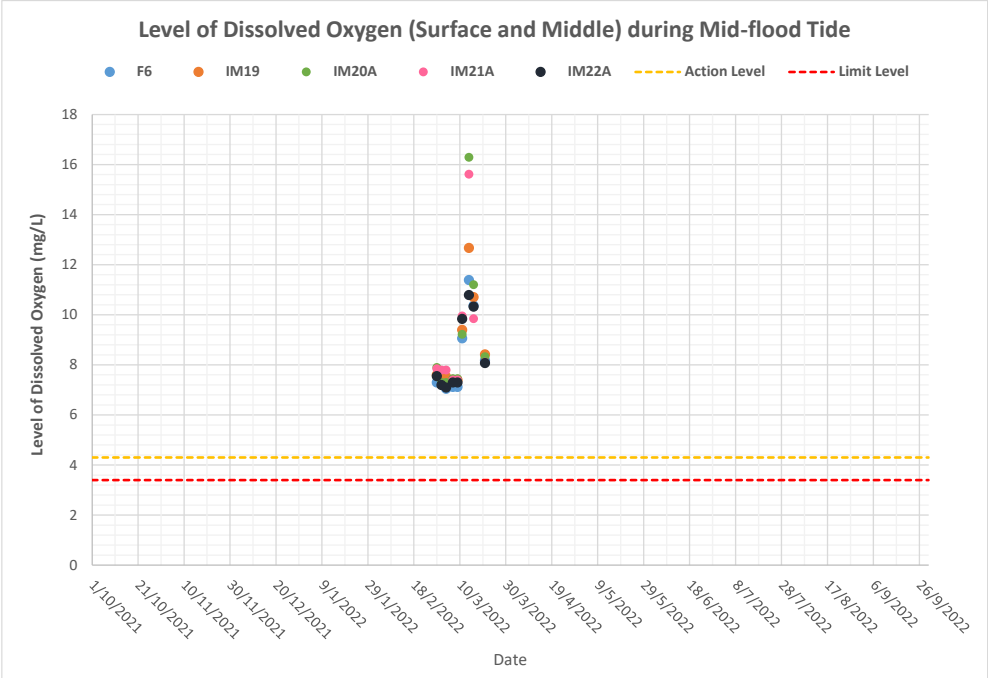


Figure F5n: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2021 and September 2022

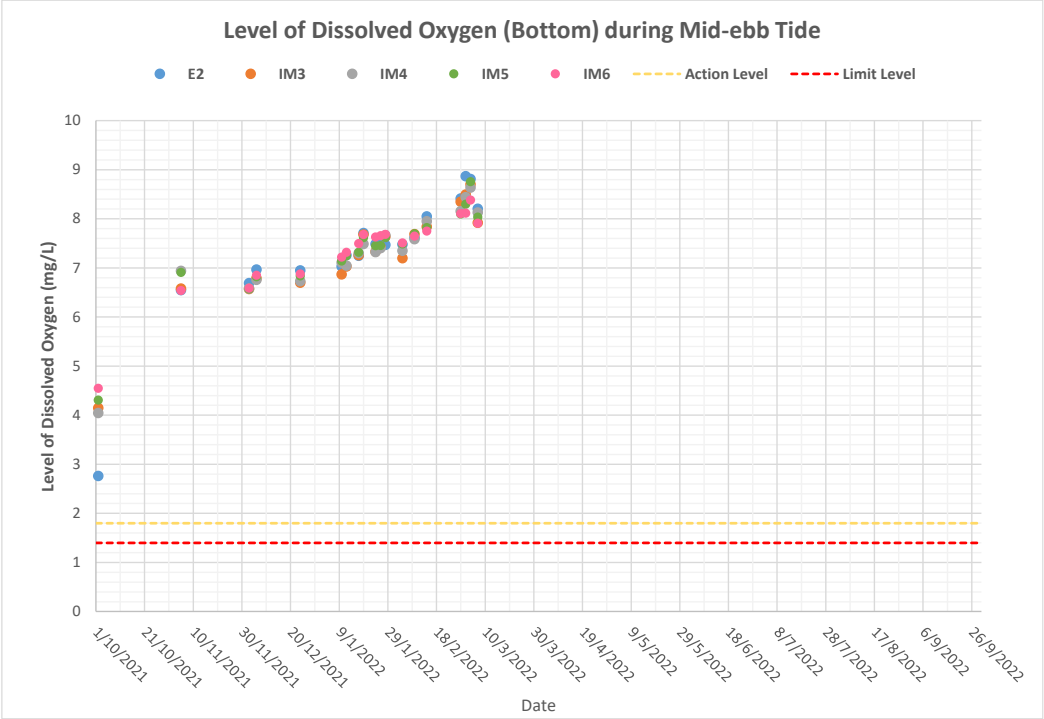


Figure F6a: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2021 and September 2022

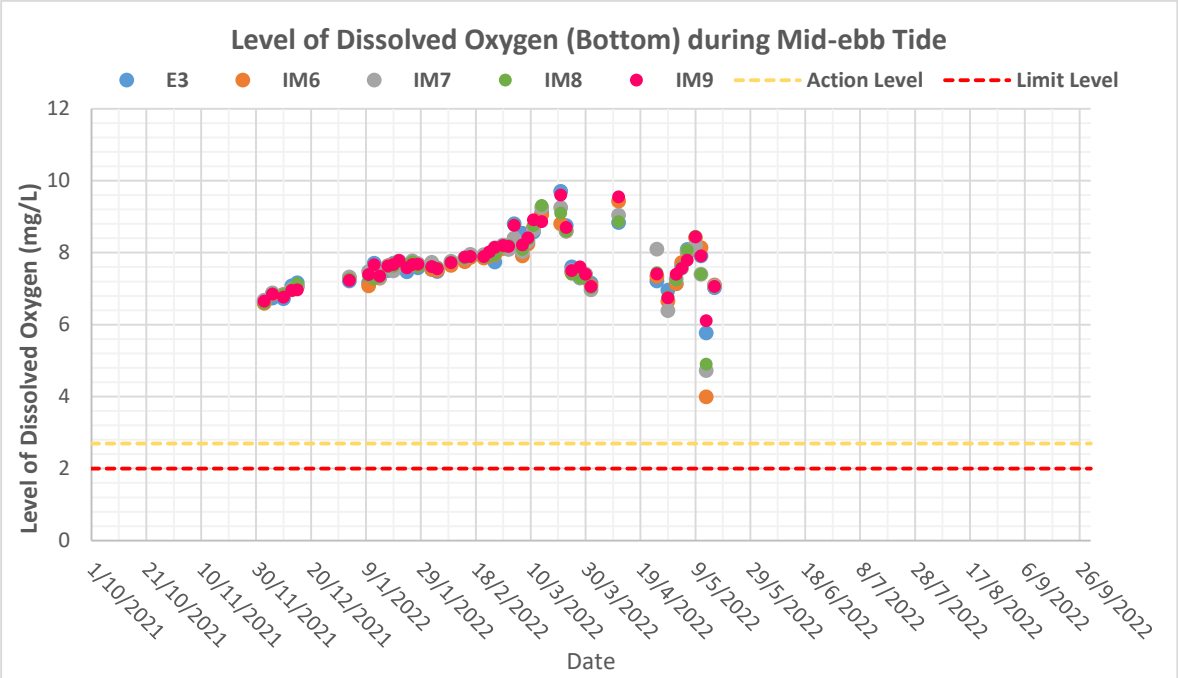


Figure F6b: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2021 and September 2022

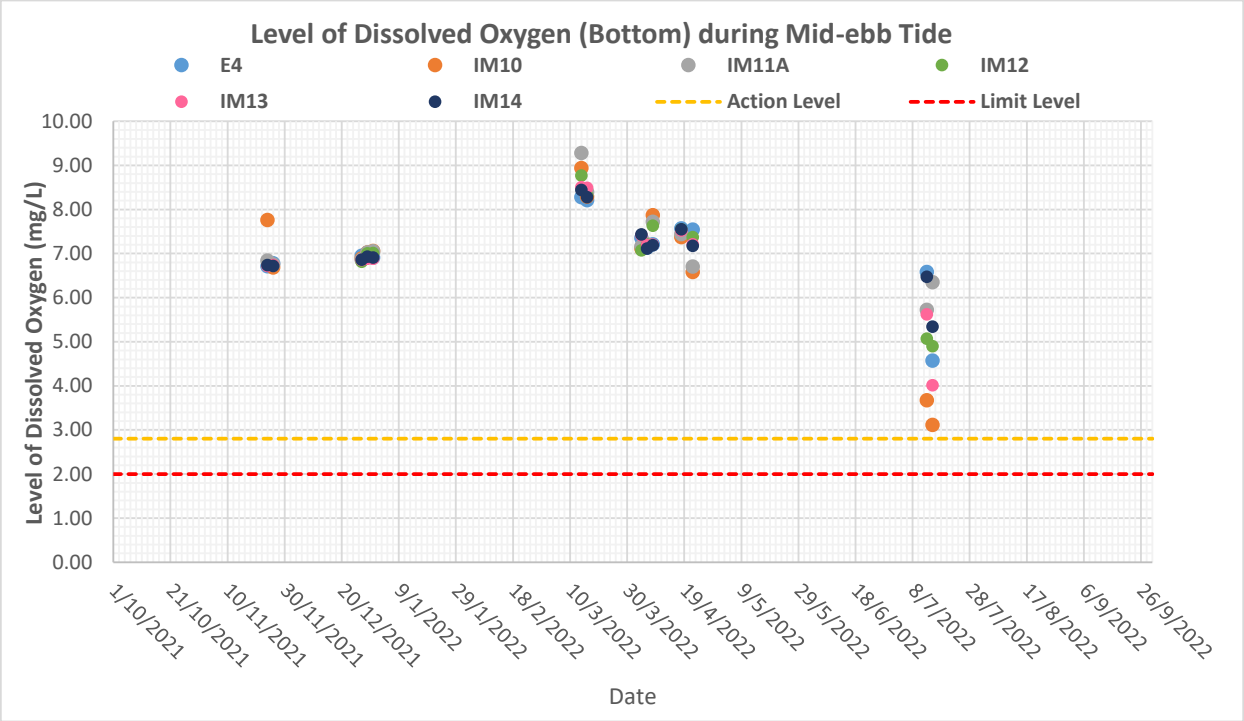


Figure F6c: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E4) and impact stations (IM10-IM14) under Group 4 during mid-ebb tides between October 2021 and September 2022

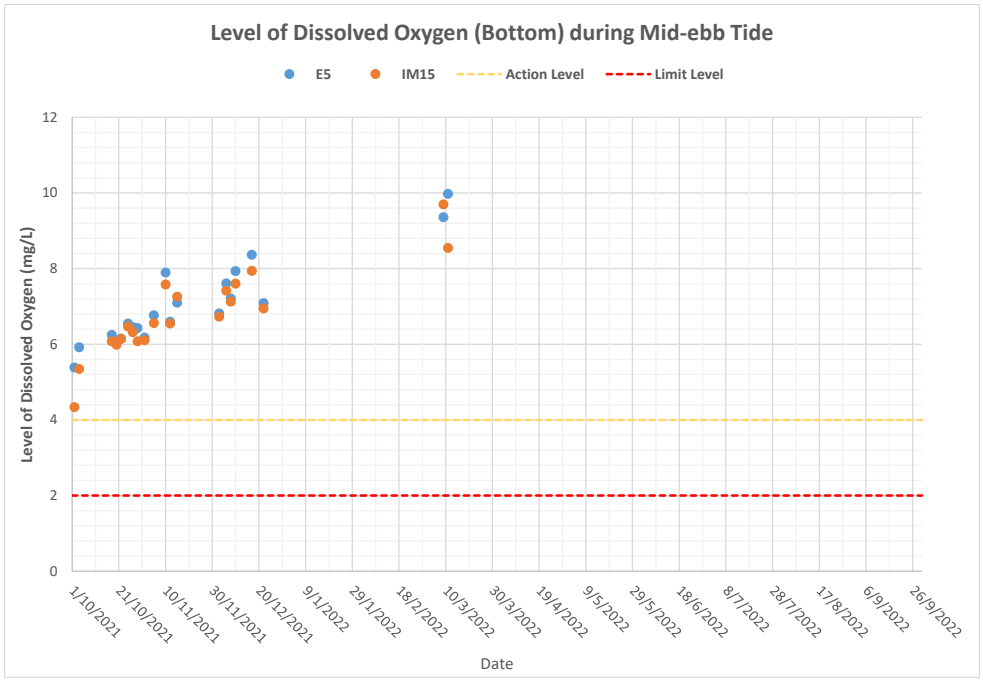


Figure F6d: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2021 and September 2022

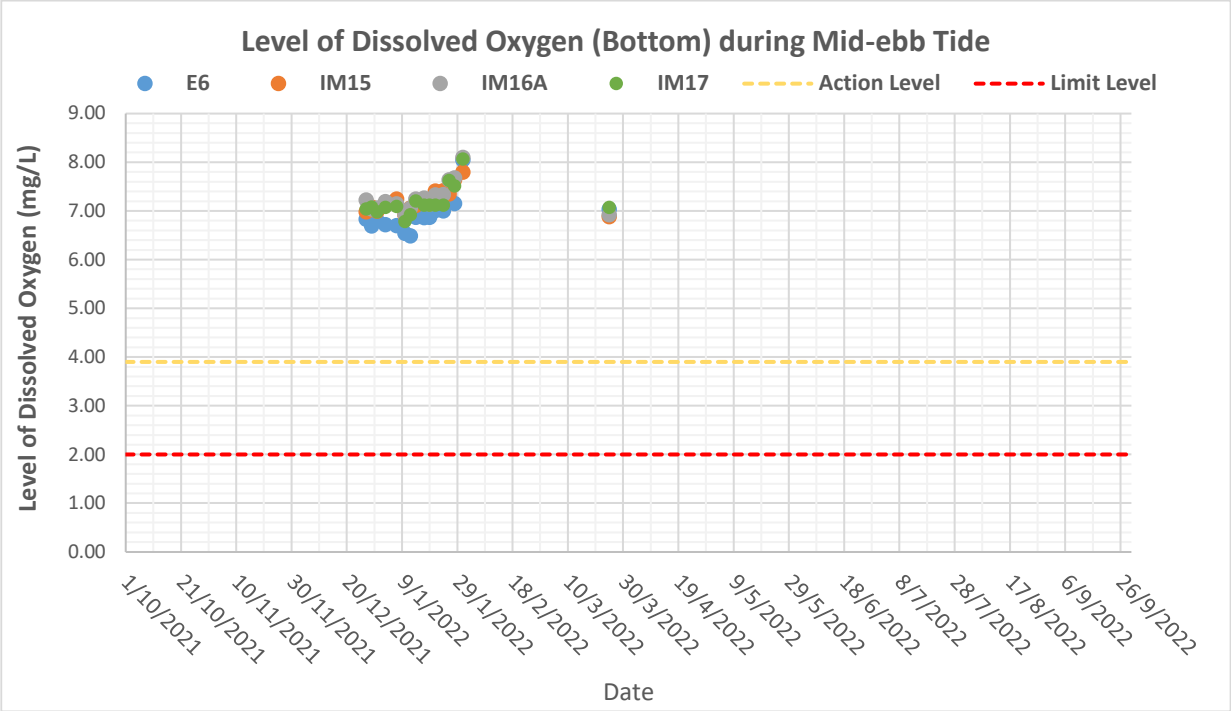


Figure F6e: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E6) and impact stations (IM15-IM17) under Group 6 during mid-ebb tides between October 2021 and September 2022

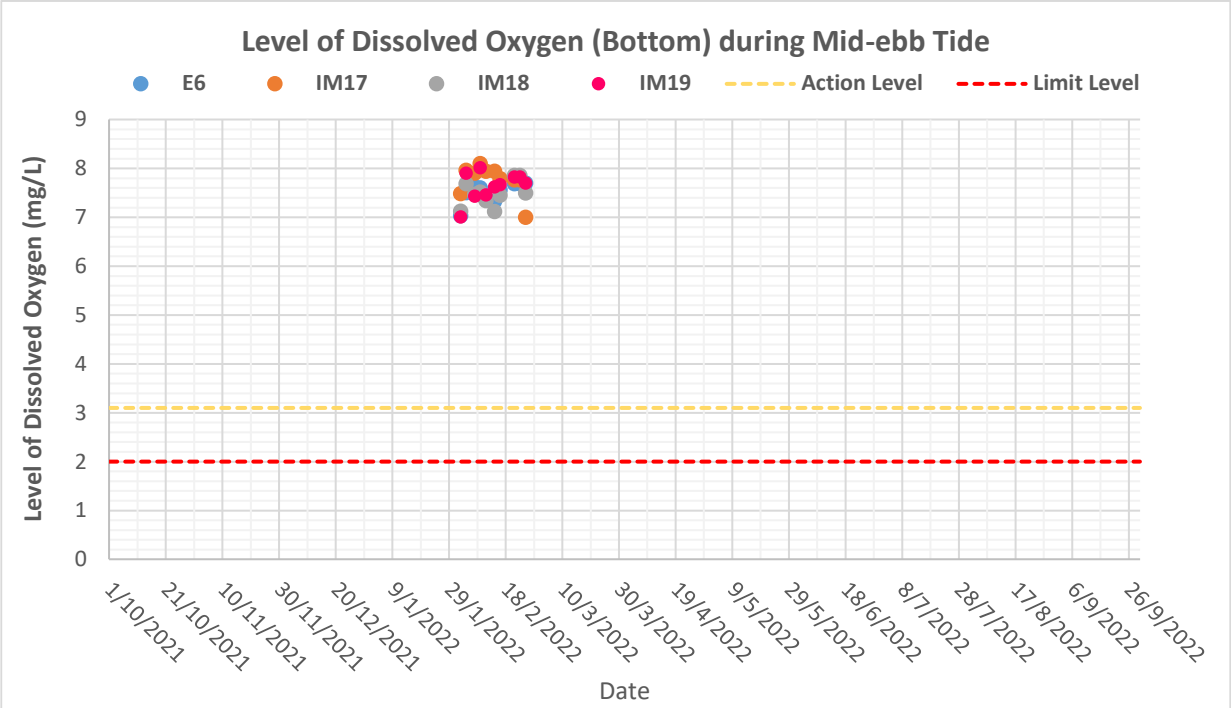


Figure F6f: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2021 and September 2022

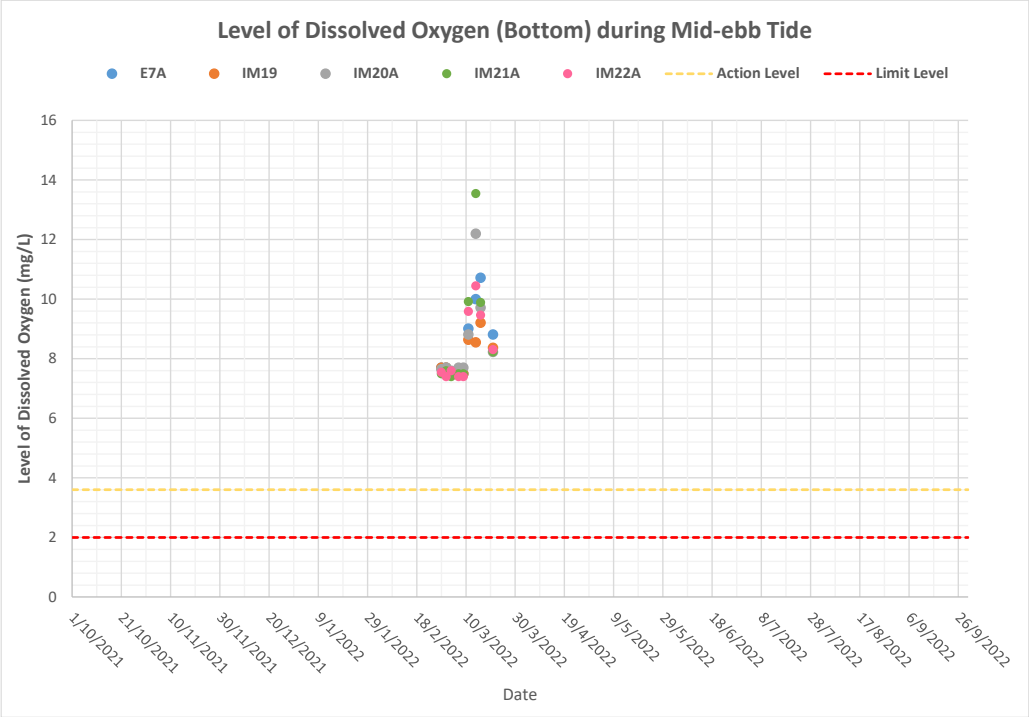


Figure F6g: Levels of Bottom Dissolved Oxygen (mg/L) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2021 and September 2022

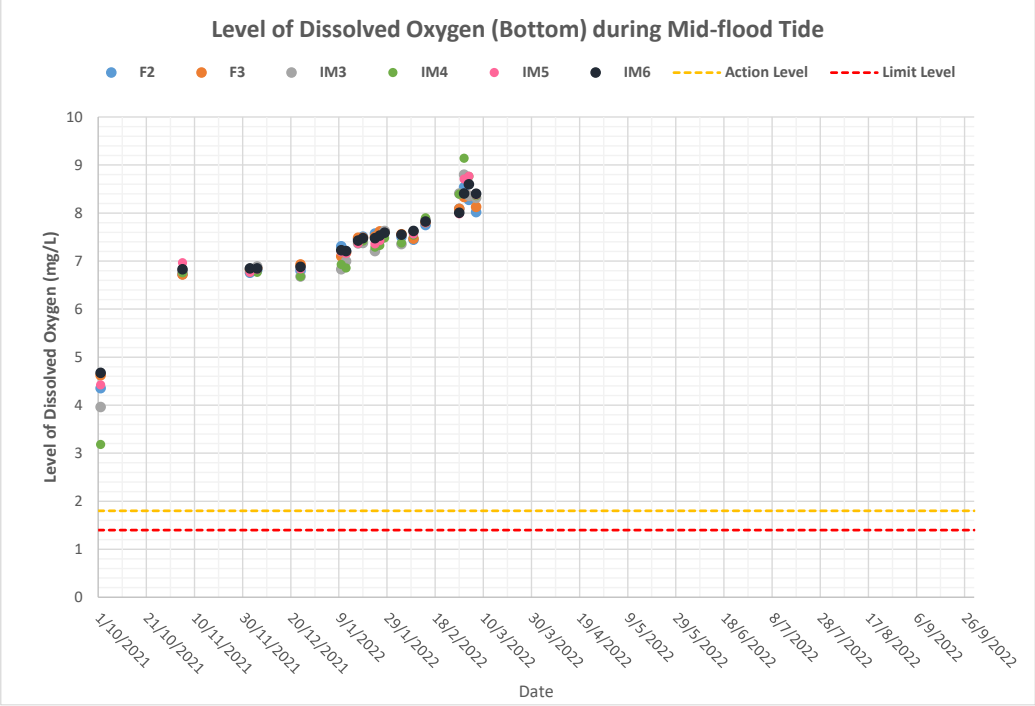


Figure F6h: Levels of Bottom Dissolved Oxygen (mg/L) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2021 and September 2022

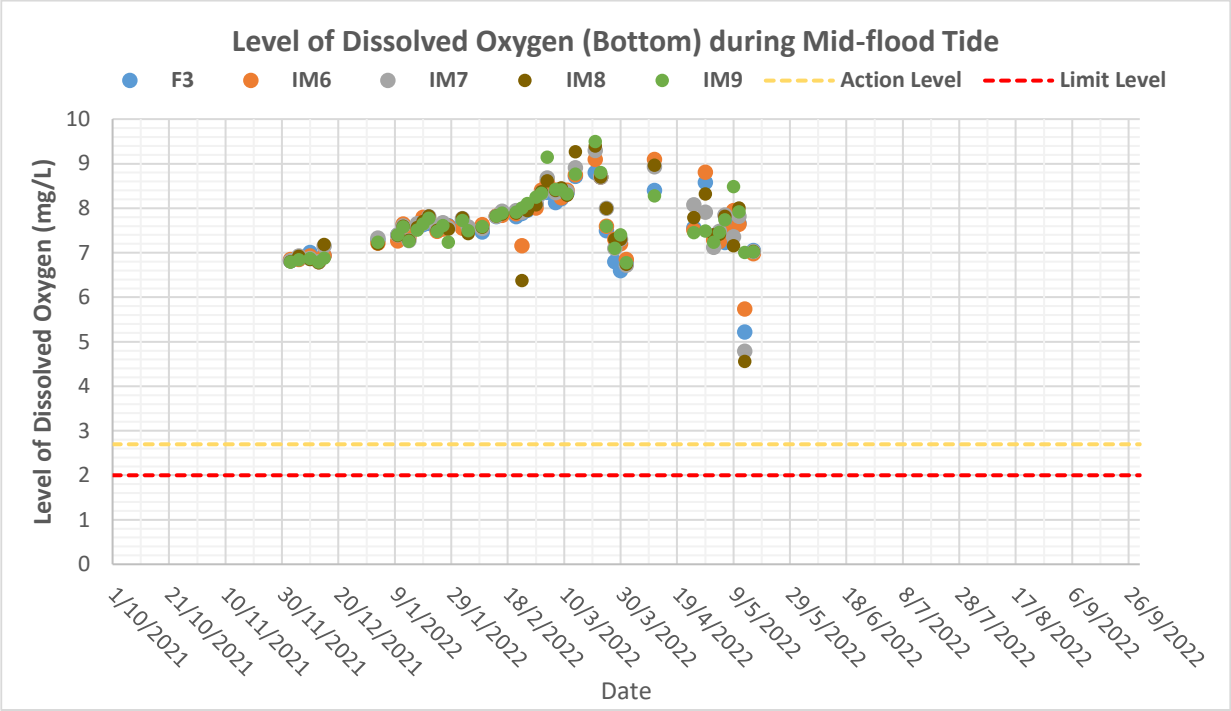


Figure F6i: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2021 and September 2022

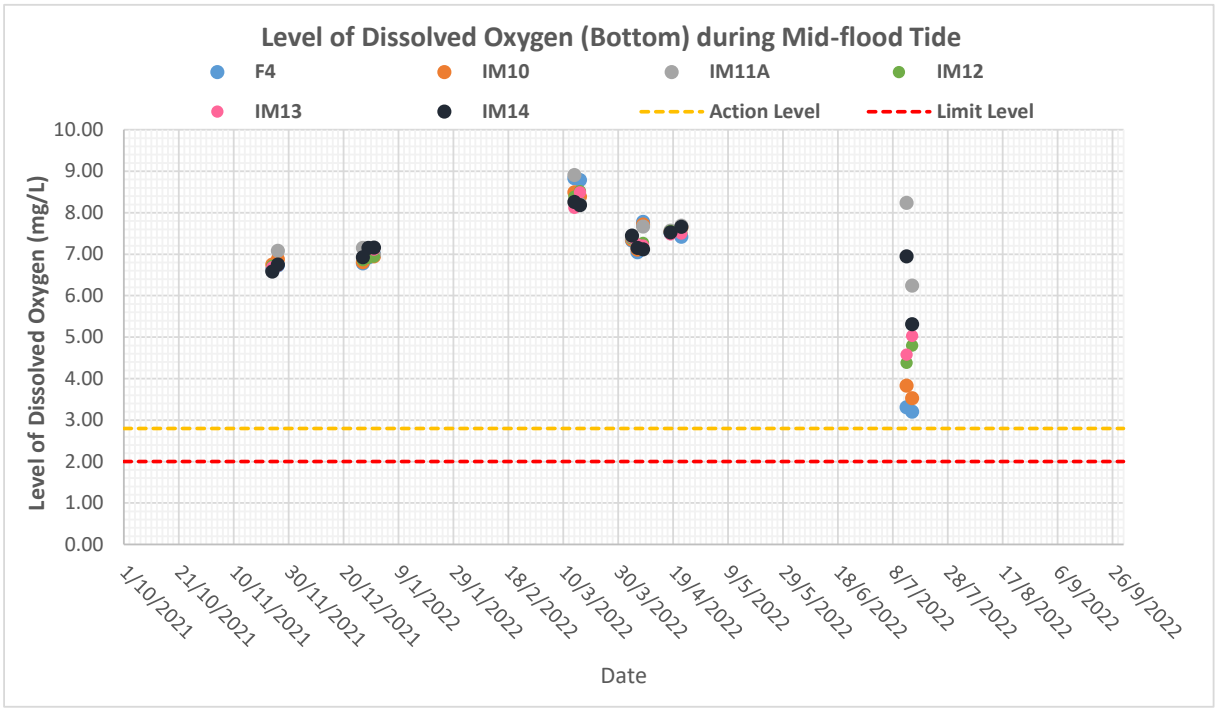


Figure F6j: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F4) and impact stations (IM10-IM14) under Group 4 during mid-flood tides between October 2021 and September 2022

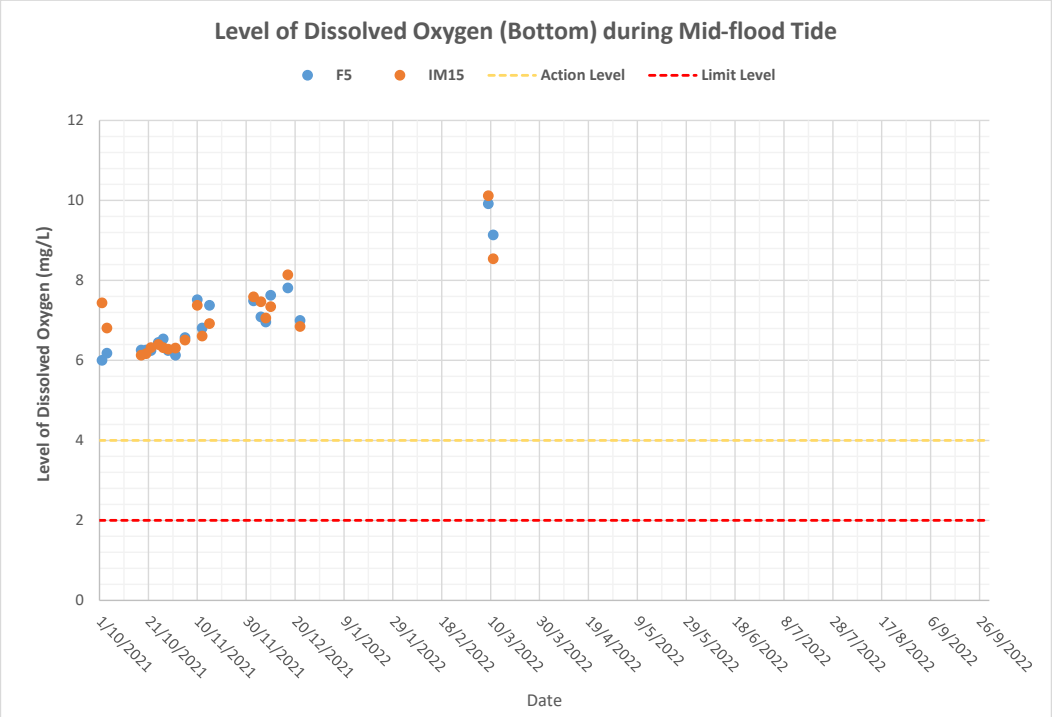


Figure F6k: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2021 and September 2022

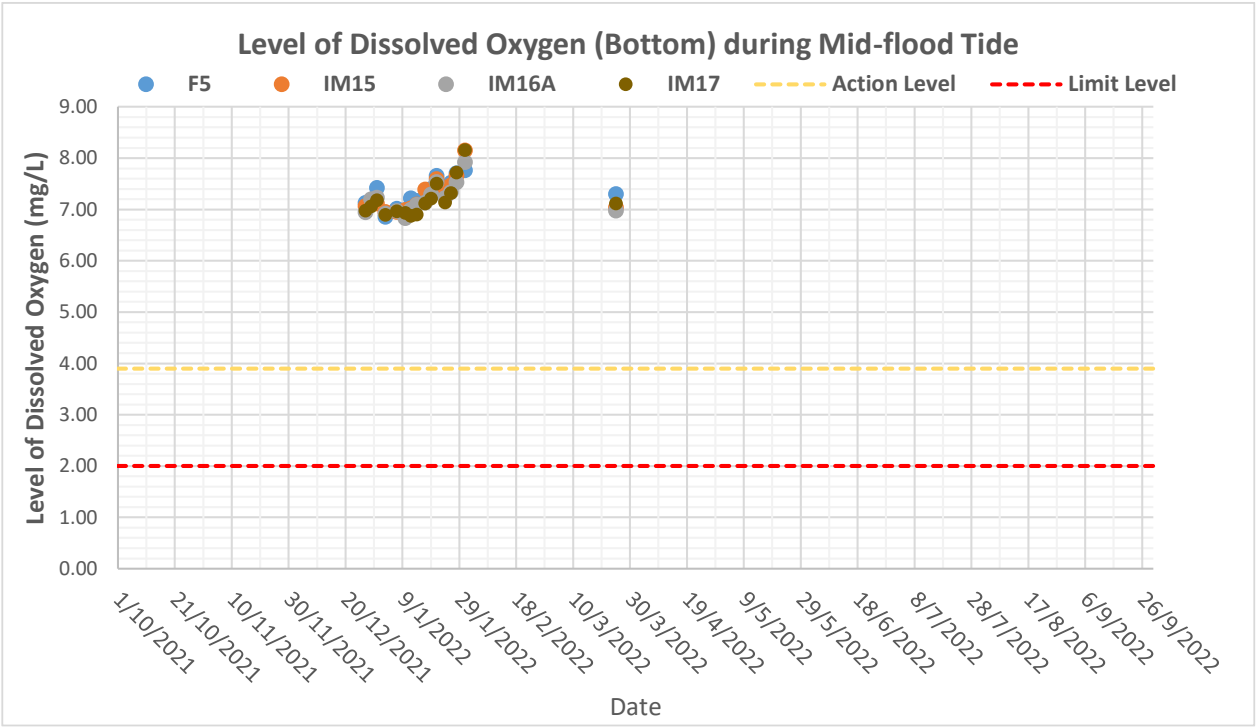


Figure F6l: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F5) and impact station (IM15) under Group 6 during mid-flood tides between October 2021 and September 2022

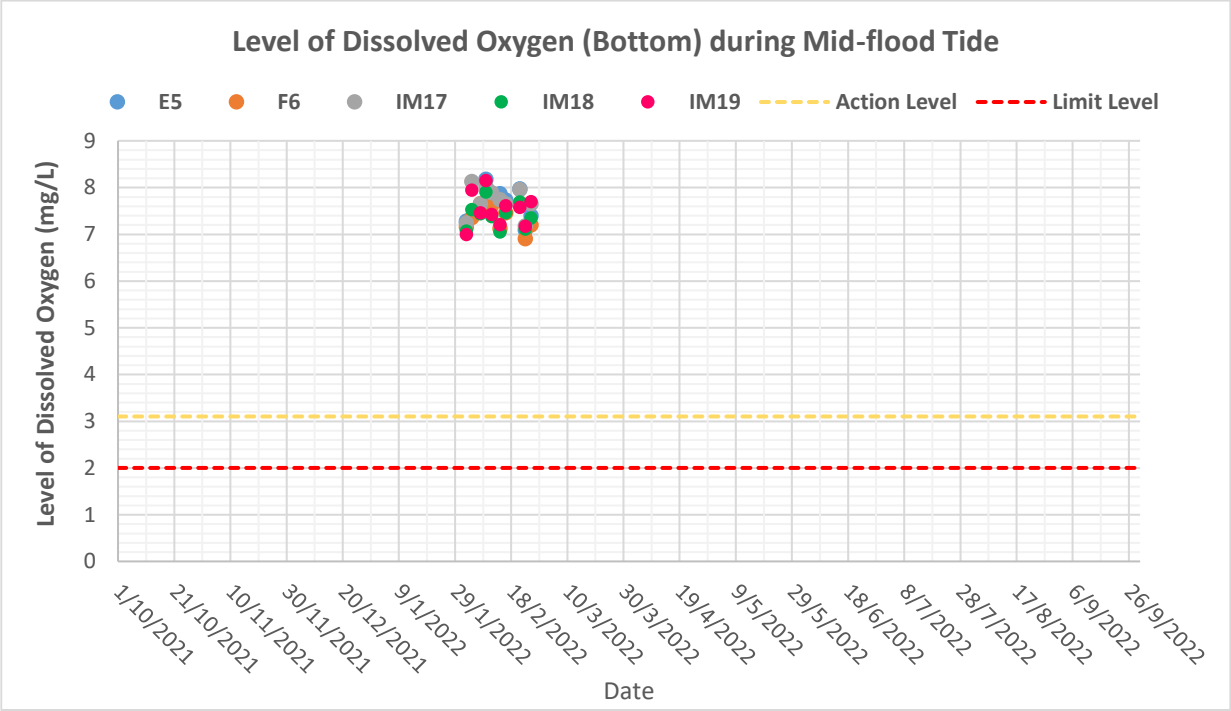


Figure F6m: Levels of Bottom Dissolved Oxygen (mg/L) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2021 and September 2022

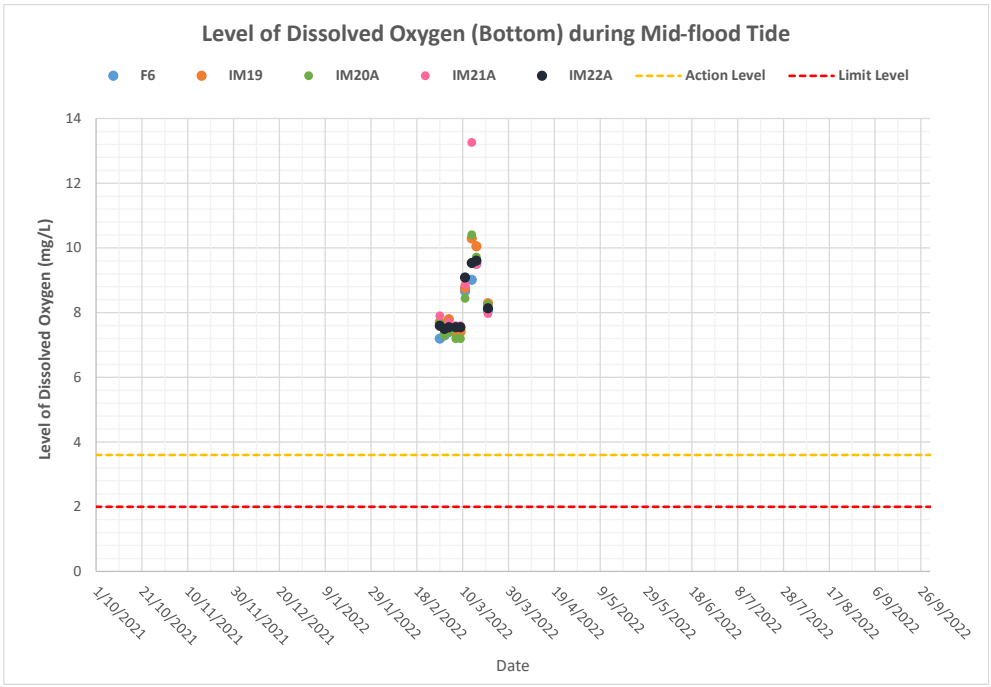


Figure F6n: Levels of Bottom Dissolved Oxygen (mg/L) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2021 and September 2022

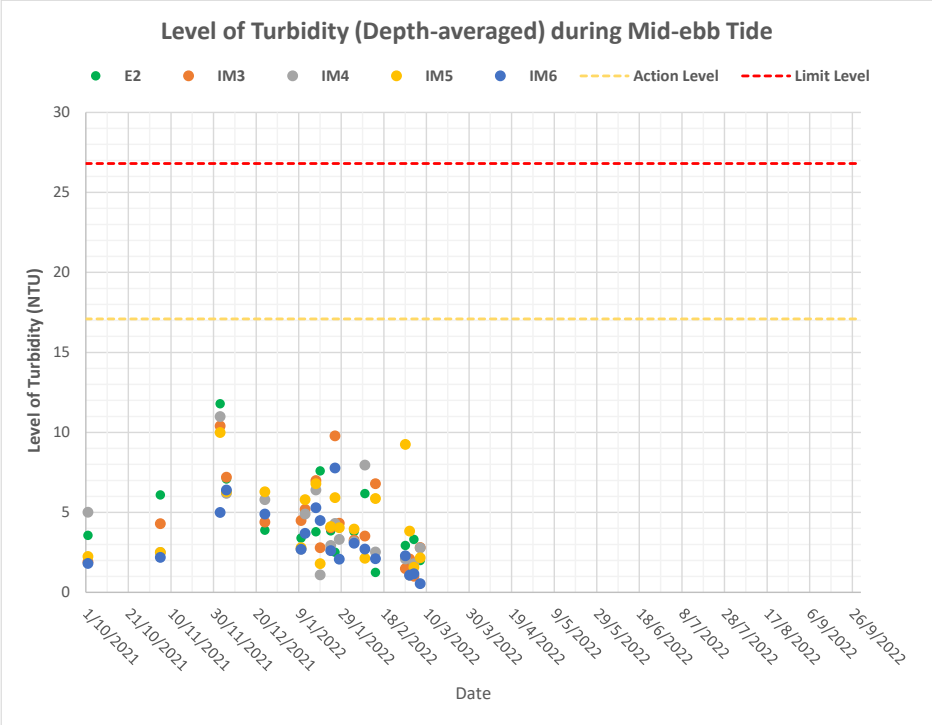


Figure F7a: Levels of Depth-averaged Turbidity (NTU) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2021 and September 2022

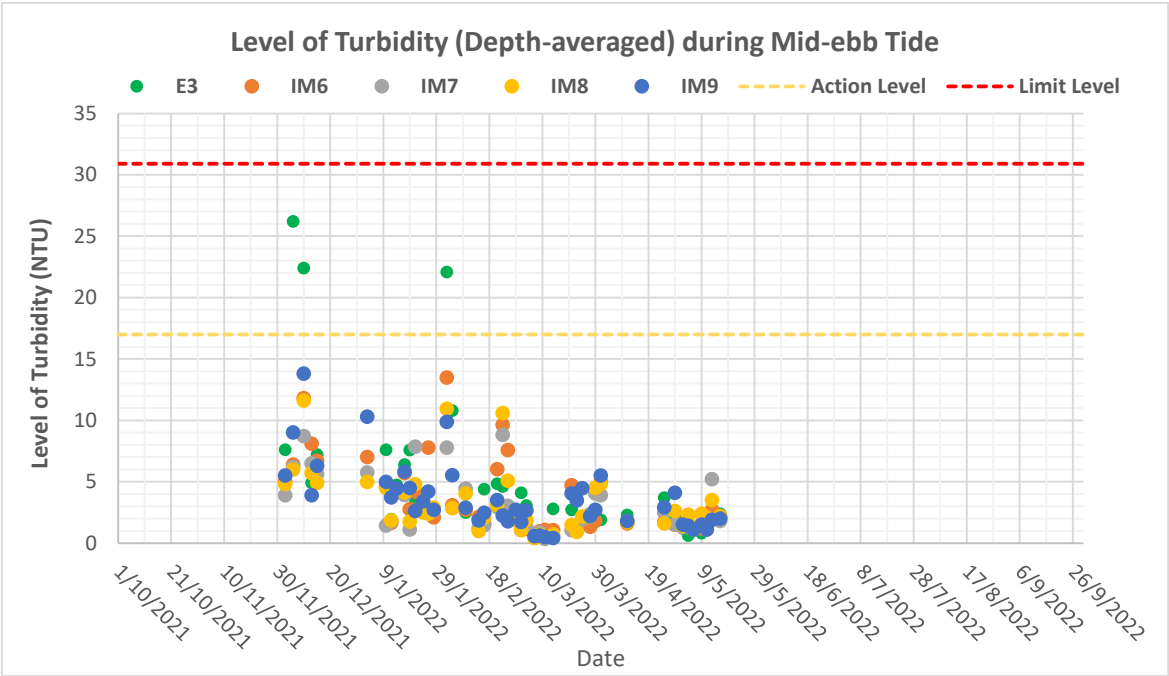


Figure F7b: Levels of Depth-averaged Turbidity (NTU) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2021 and September 2022

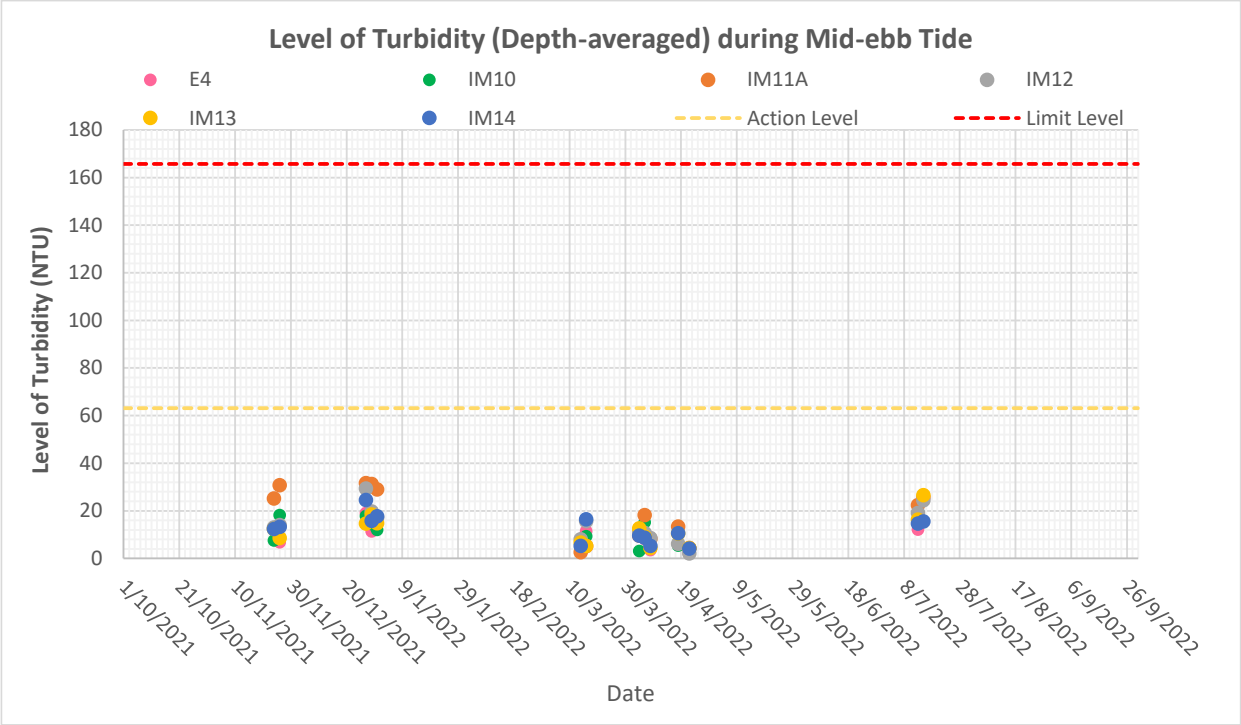


Figure F7c: Levels of Depth-averaged Turbidity (NTU) at control station (E4) and impact stations (IM10-IM14) under Group 4 during mid-ebb tides between October 2021 and September 2022

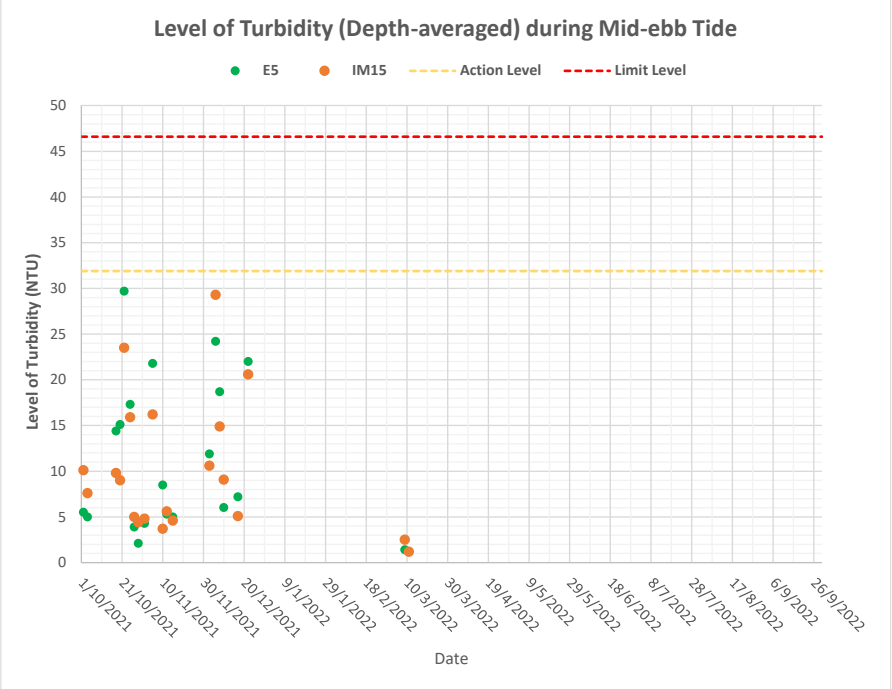


Figure F7d: Levels of Depth-averaged Turbidity (NTU) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2021 and September 2022

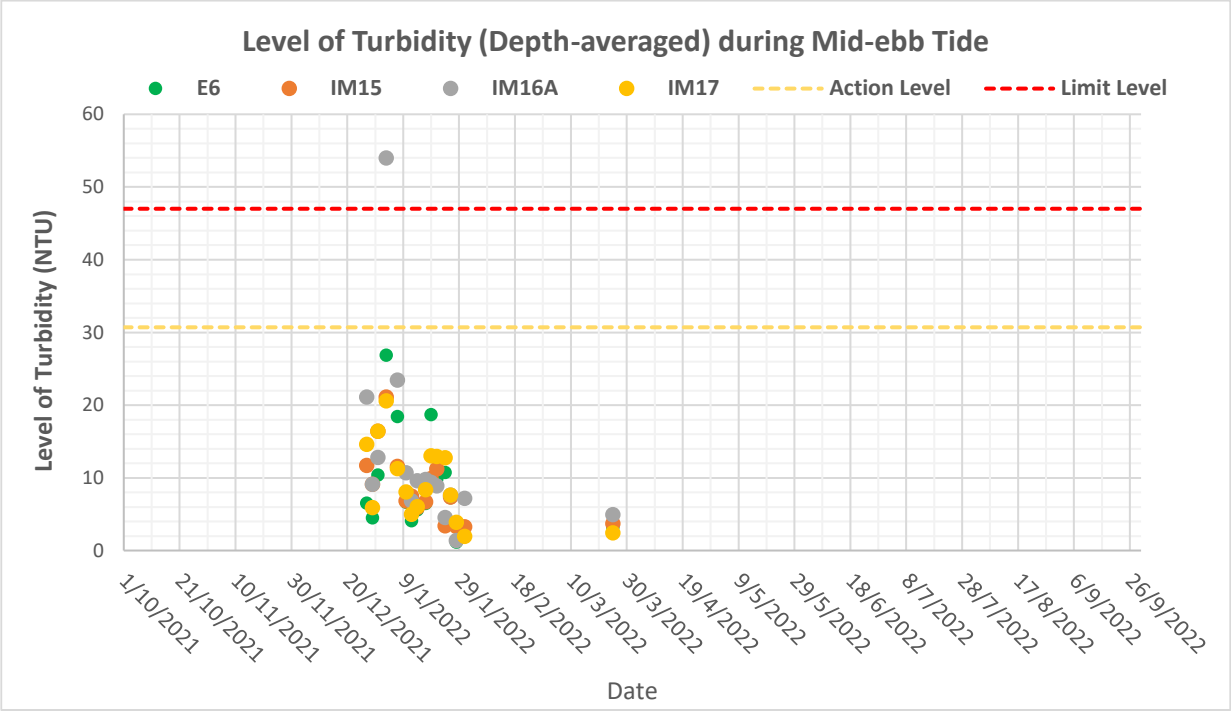


Figure F7e: Levels of Depth-averaged Turbidity (NTU) at control station (E6) and impact stations (IM15-IM17) under Group 6 during mid-ebb tides between October 2021 and September 2022

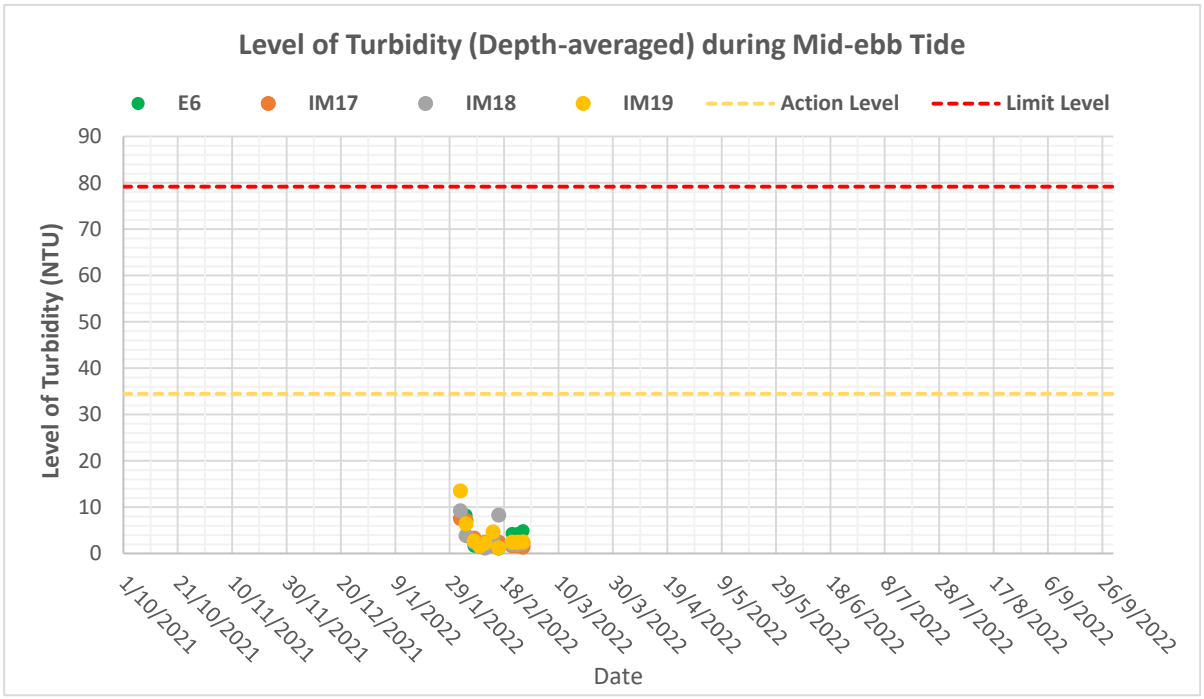


Figure F7f: Levels of Depth-averaged Turbidity (NTU) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2021 and September 2022

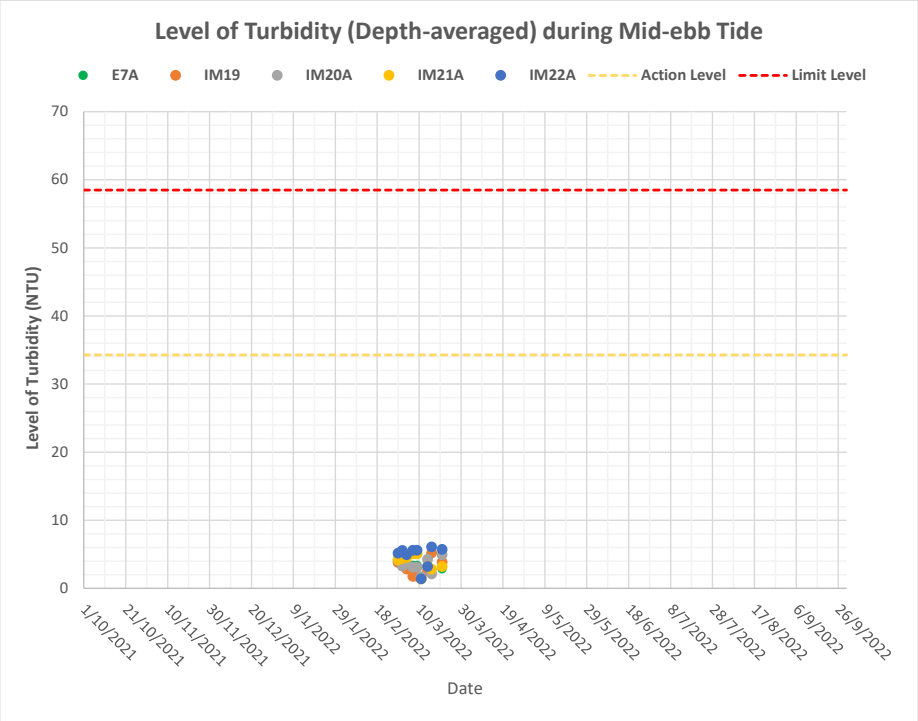


Figure F7g: Levels of Depth-averaged Turbidity (NTU) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2021 and September 2022

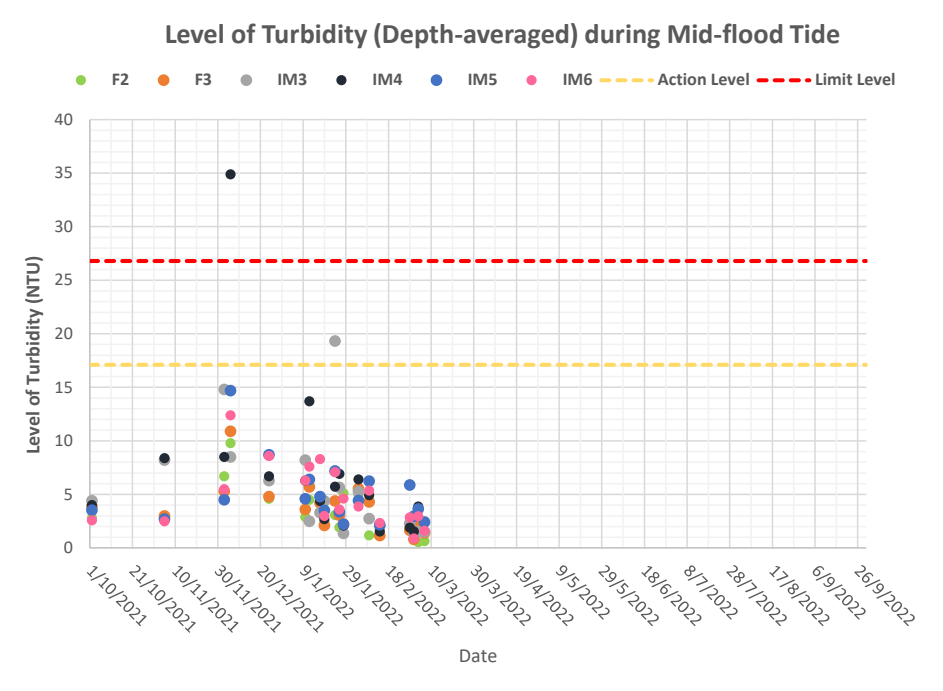


Figure F7h: Levels of Depth-averaged Turbidity (NTU) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2021 and September 2022

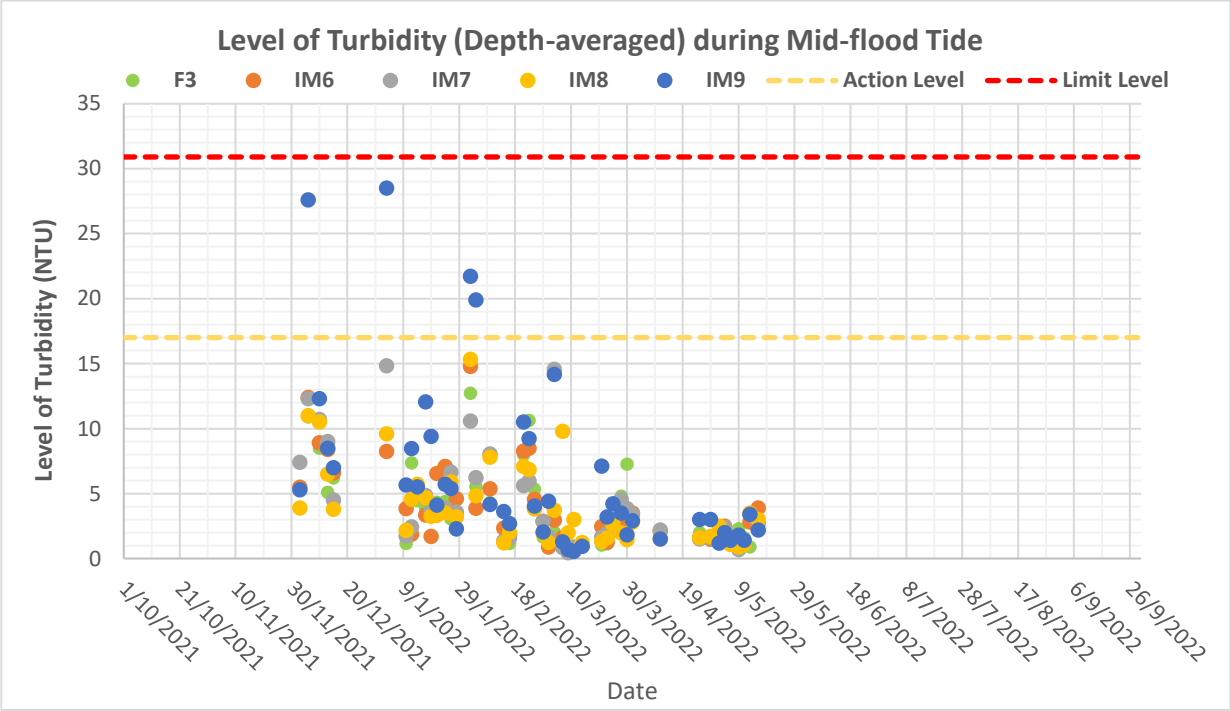


Figure F7i: Levels of Depth-averaged Turbidity (NTU) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2021 and September 2022

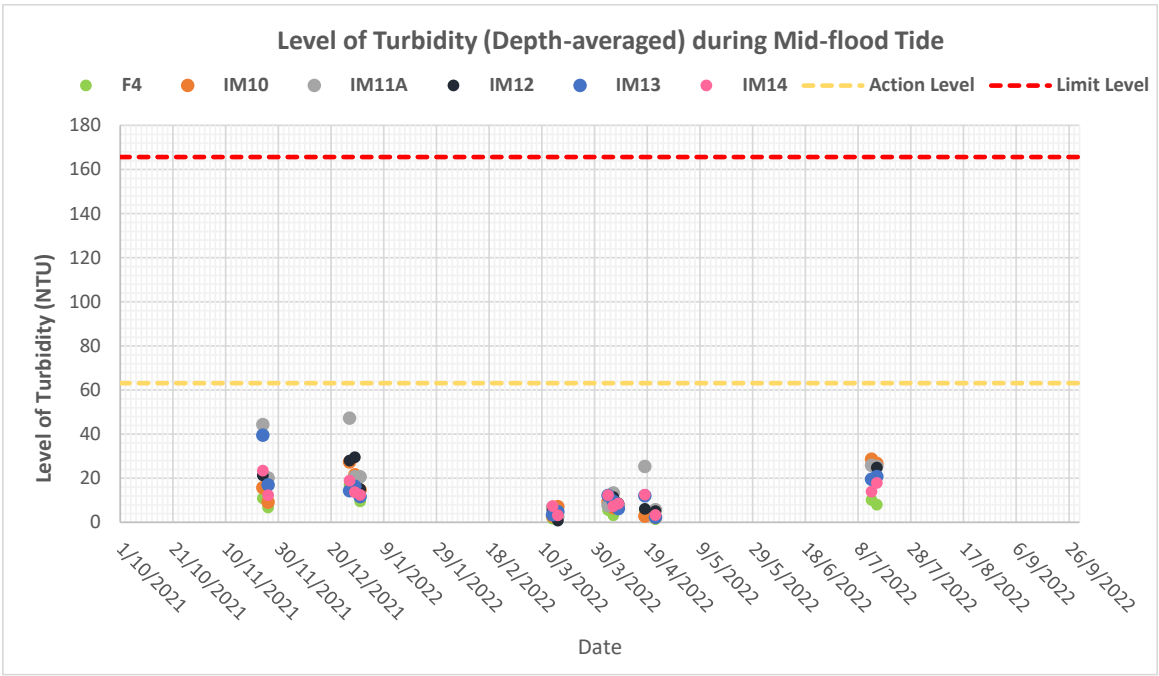


Figure F7j: Levels of Depth-averaged Turbidity (NTU) at control station (F4) and impact stations (IM10-IM14) under Group 4 during mid-flood tides between October 2021 and September 2022

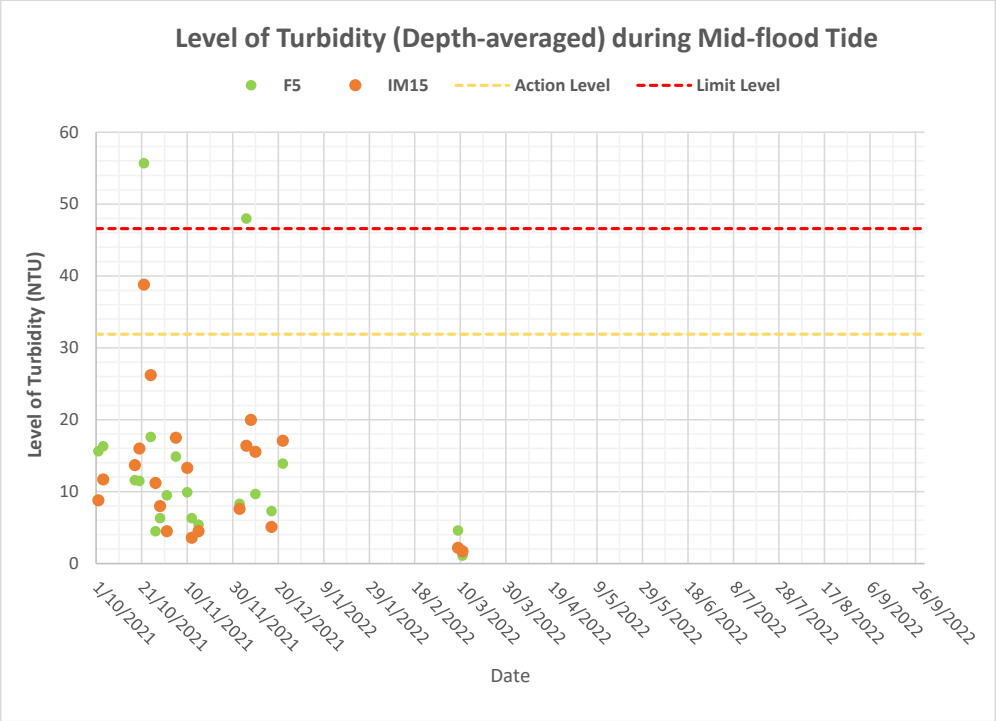


Figure F7k: Levels of Depth-averaged Turbidity (NTU) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2021 and September 2022

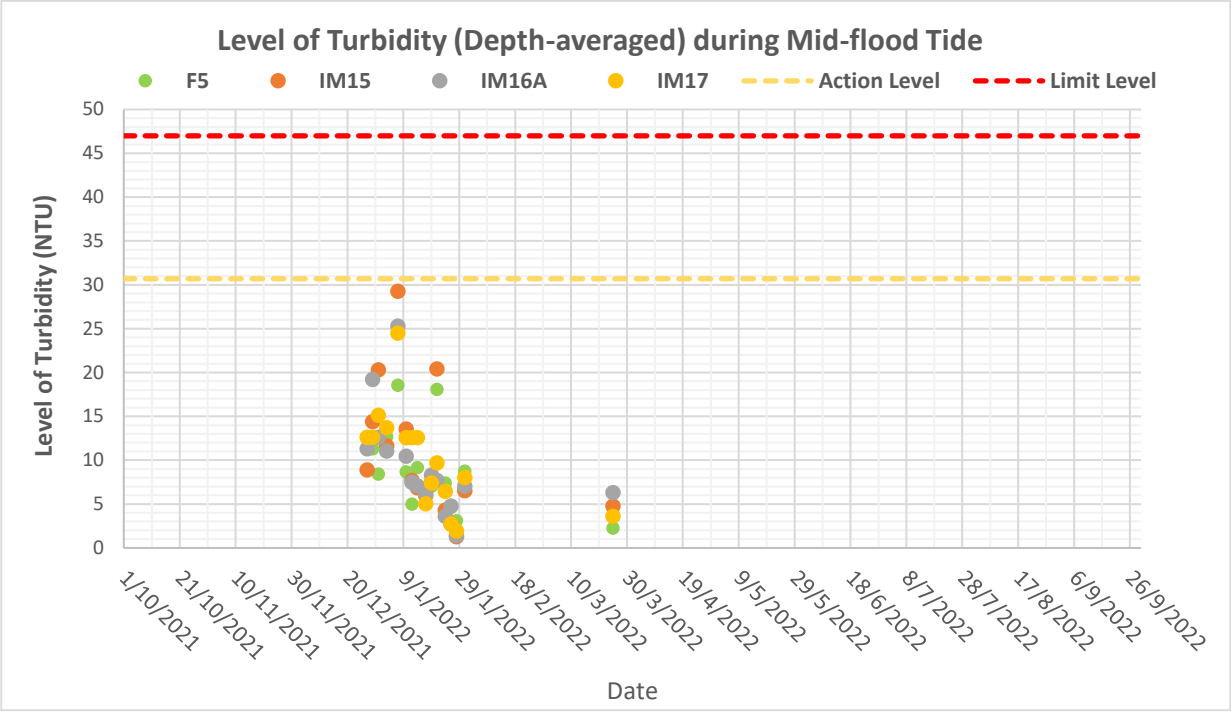


Figure F7l: Levels of Depth-averaged Turbidity (NTU) at control station (F5) and impact station (IM15) under Group 6 during mid-flood tides between October 2021 and September 2022

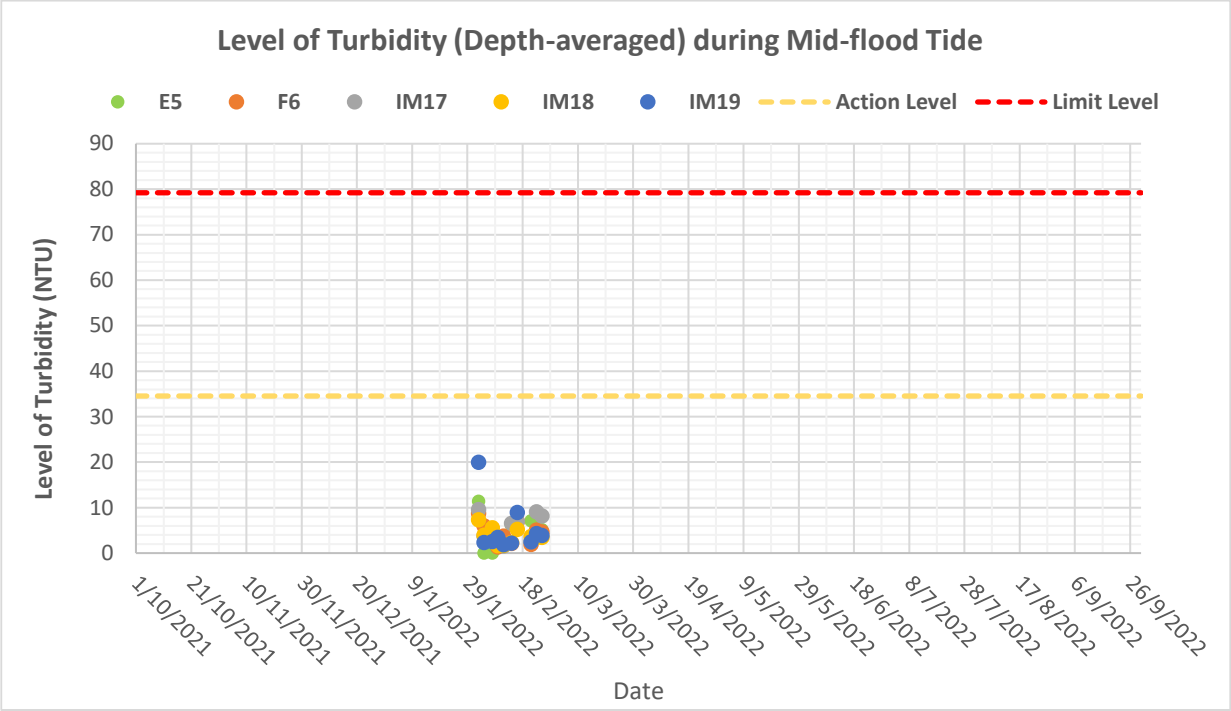


Figure F7m: Levels of Depth-averaged Turbidity (NTU) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2021 and September 2022

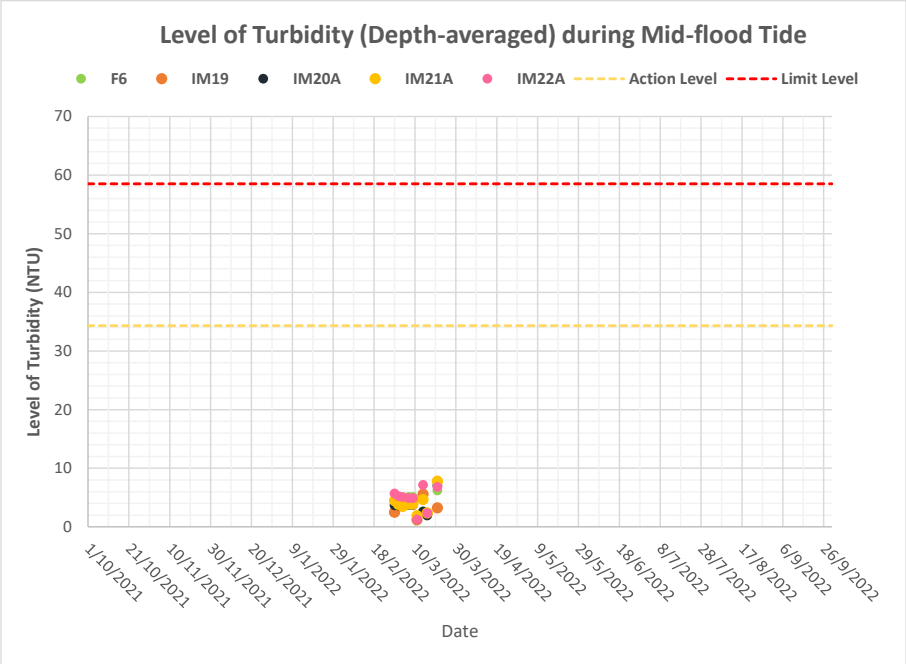


Figure F7n: Levels of Depth-averaged Turbidity (NTU) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2021 and September 2022

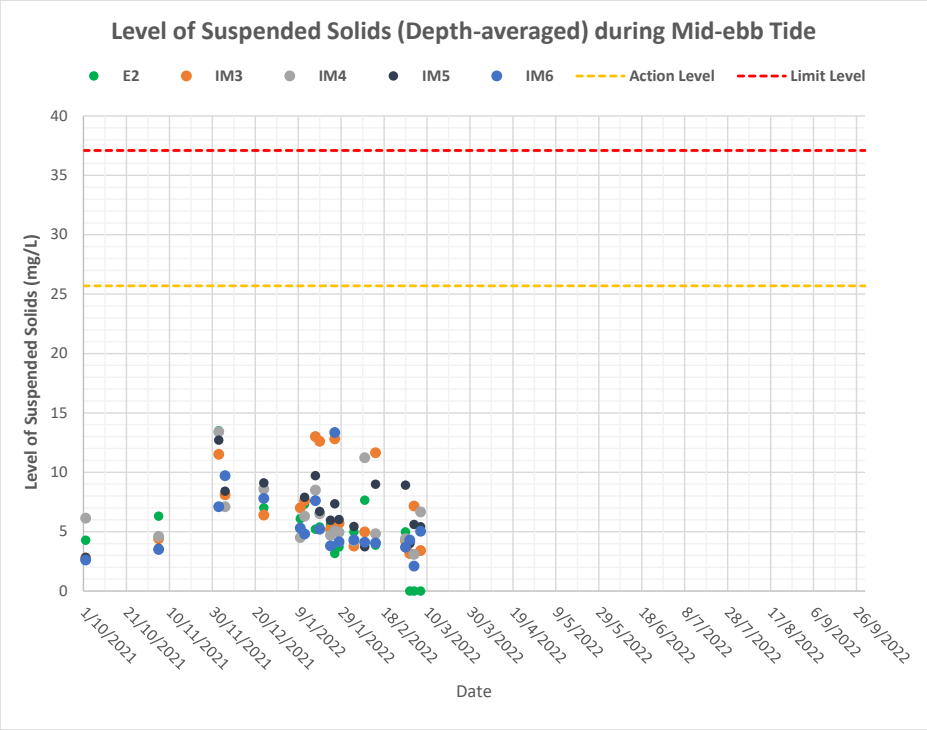


Figure F8a: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E2) and impact stations (IM3-IM6) under Group 2 during mid-ebb tides between October 2021 and September 2022

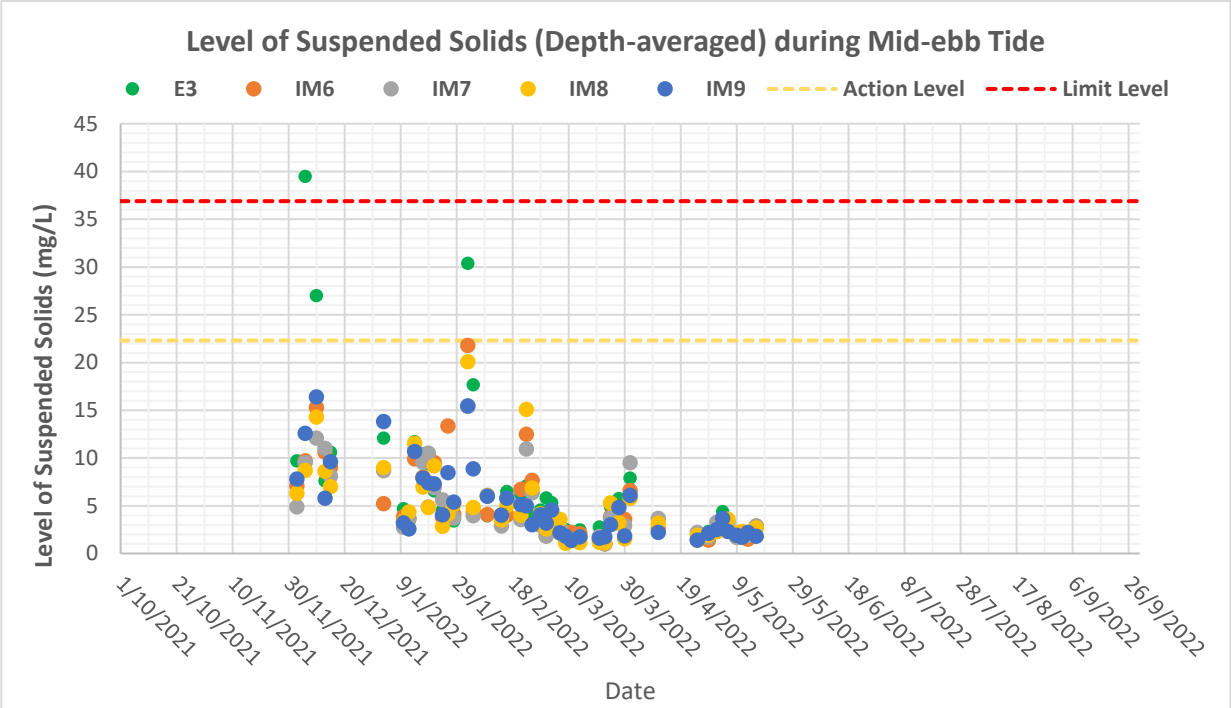


Figure F8b: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E3) and impact stations (IM6-IM9) under Group 3 during mid-ebb tides between October 2021 and September 2022

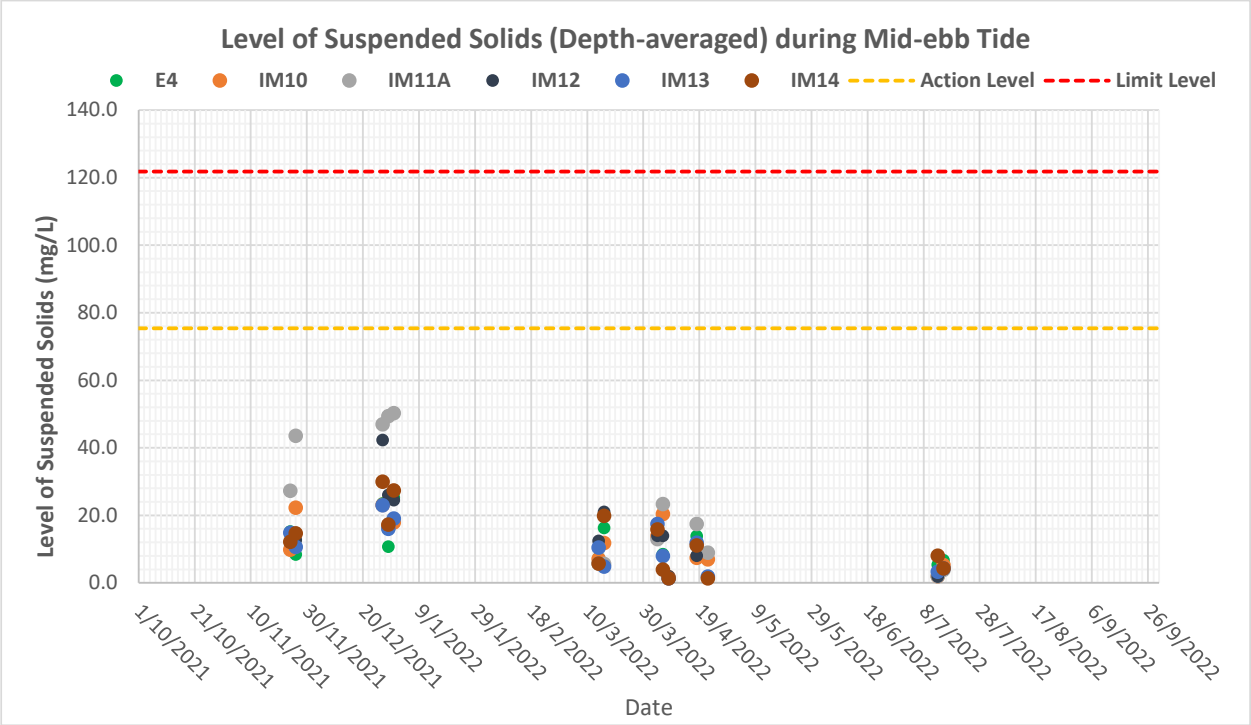


Figure F8c: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E4) and impact stations (IM10-IM14) under Group 4 during mid-ebb tides between October 2021 and September 2022

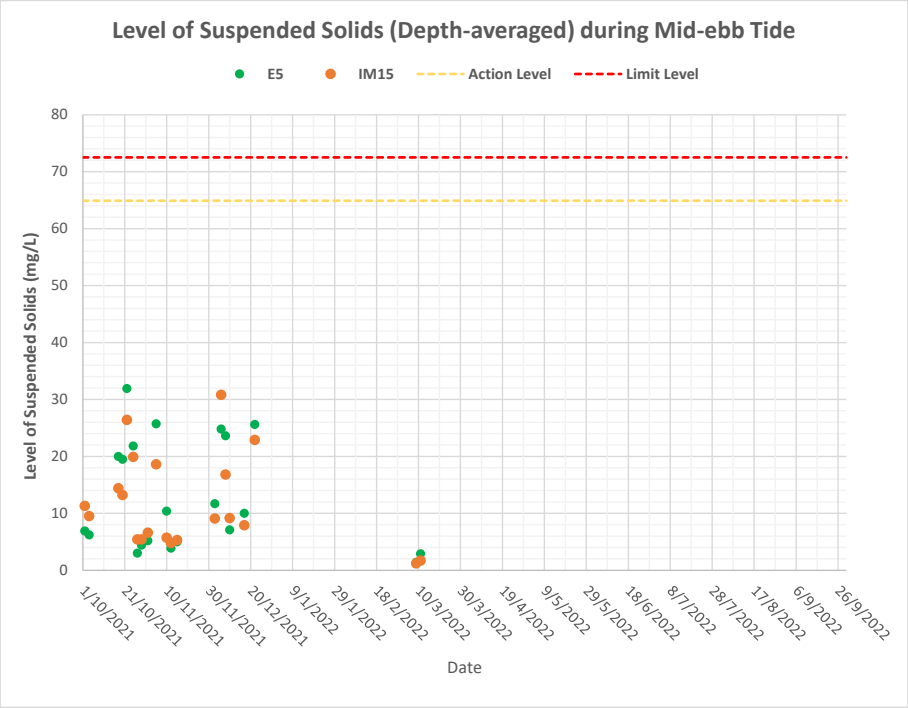


Figure F8d: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E5) and impact station (IM15) under Group 5 during mid-ebb tides between October 2021 and September 2022

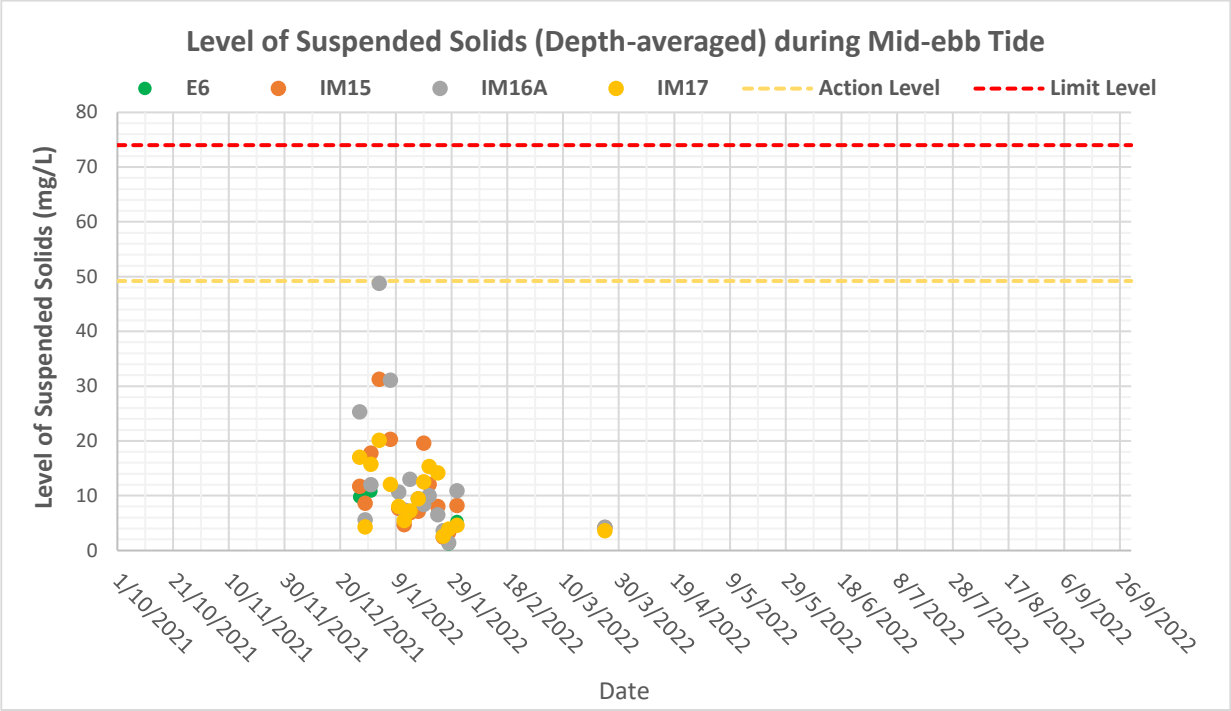


Figure F8e: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E6) and impact stations (IM15-IM17) under Group 6 during mid-ebb tides between October 2021 and September 2022

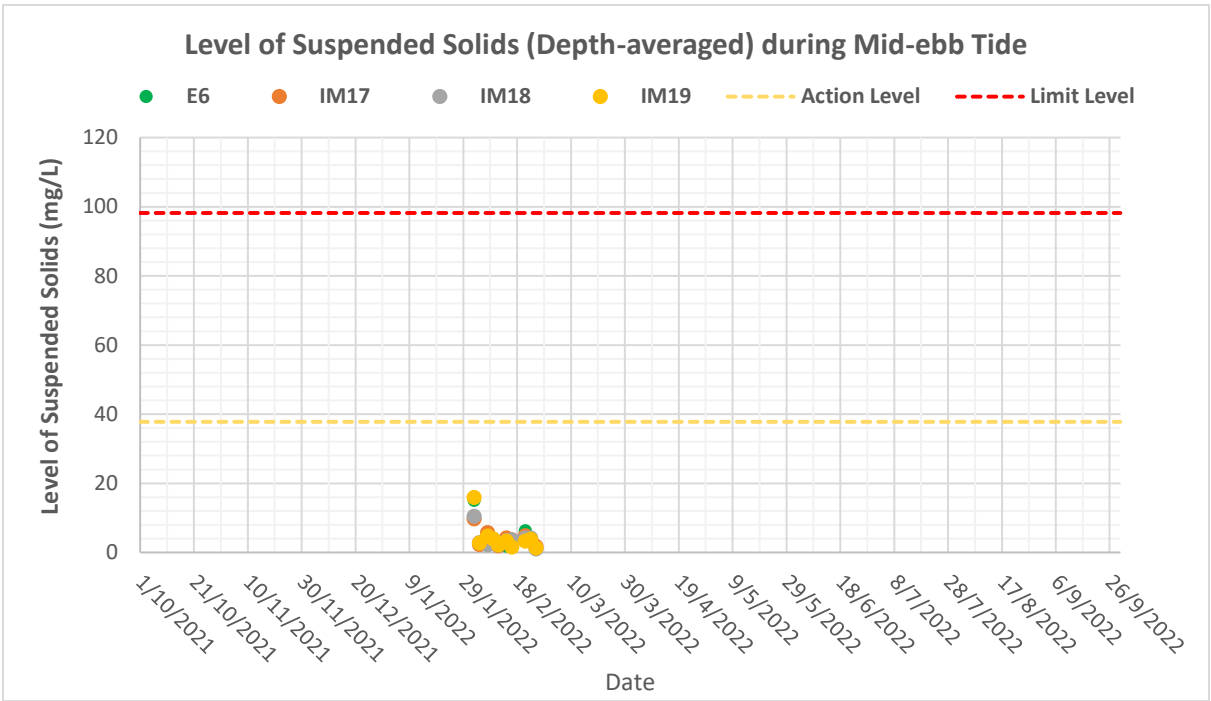


Figure F8f: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E6) and impact stations (IM17-IM19) under Group 7 during mid-ebb tides between October 2021 and September 2022

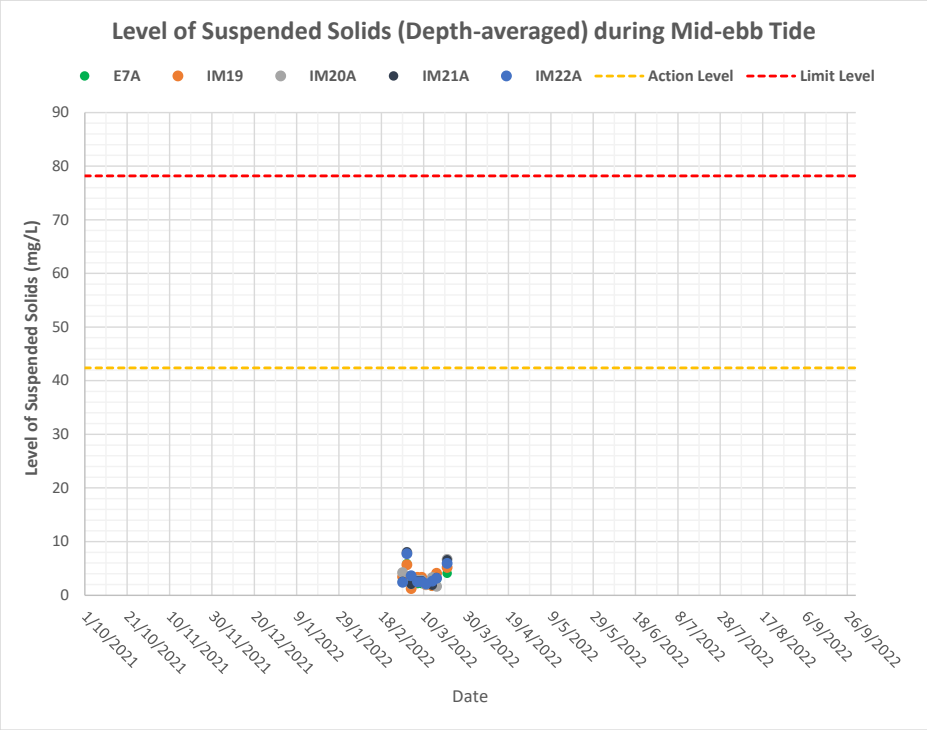


Figure F8g: Levels of Depth-averaged Suspended Solids (mg/L) at control station (E7A) and impact stations (IM19-IM22A) under Group 8 during mid-ebb tides between October 2021 and September 2022

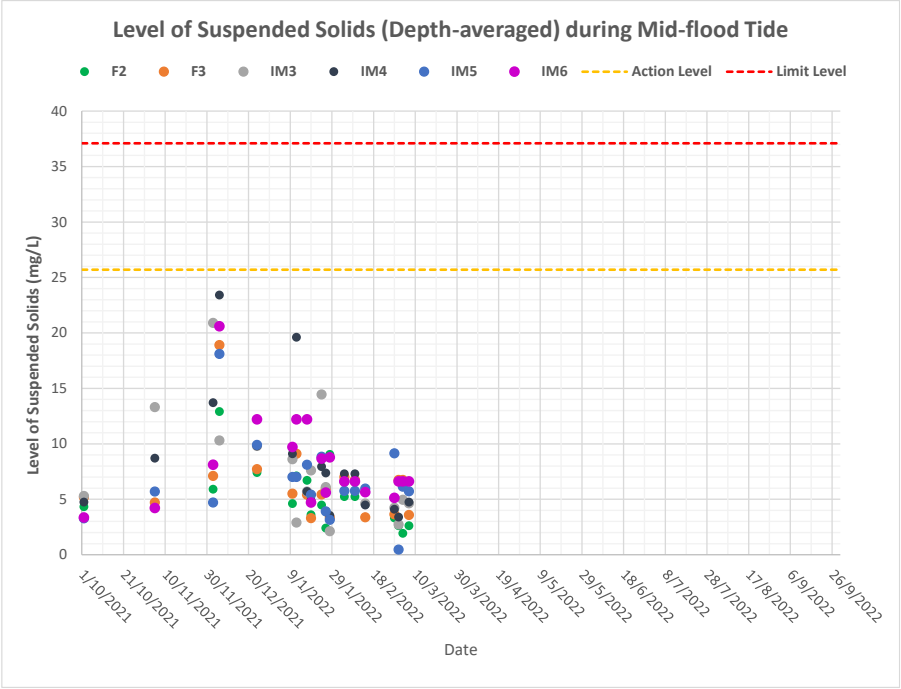


Figure F8h: Levels of Depth-averaged Suspended Solids (mg/L) at control stations (F2-F3) and impact stations (IM3-IM6) under Group 2 during mid-flood tides between October 2021 and September 2022

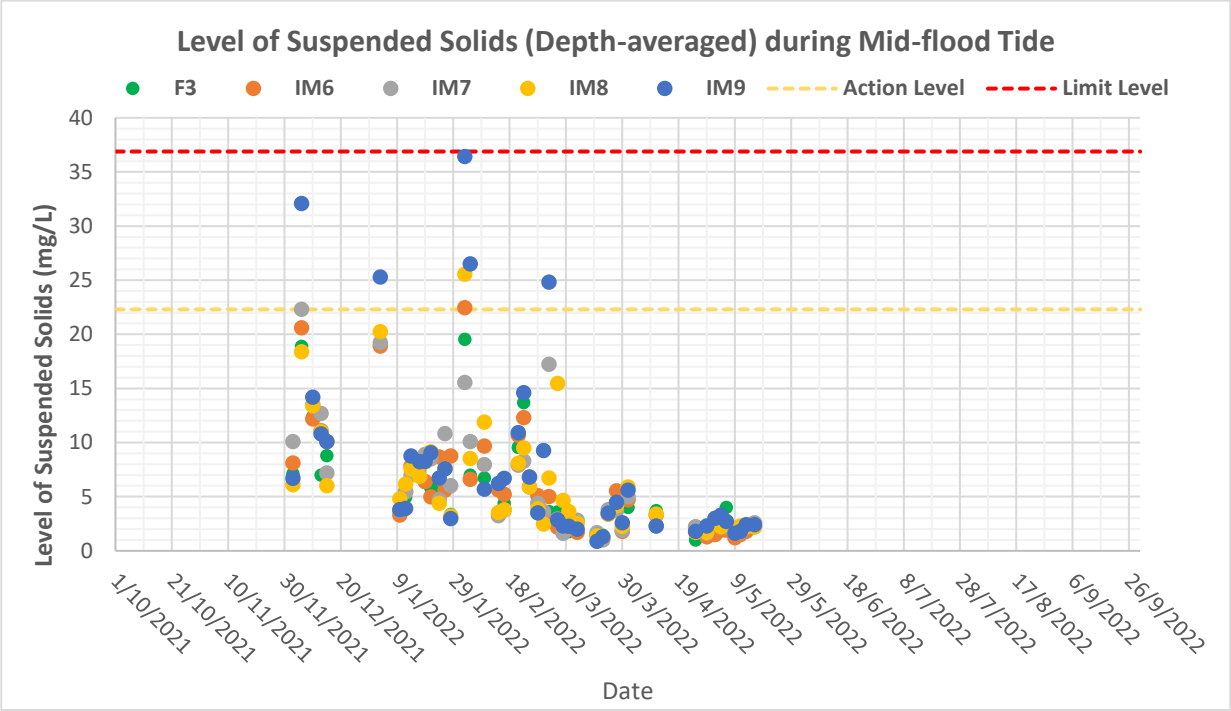


Figure F8i: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F3) and impact stations (IM6-IM9) under Group 3 during mid-flood tides between October 2021 and September 2022

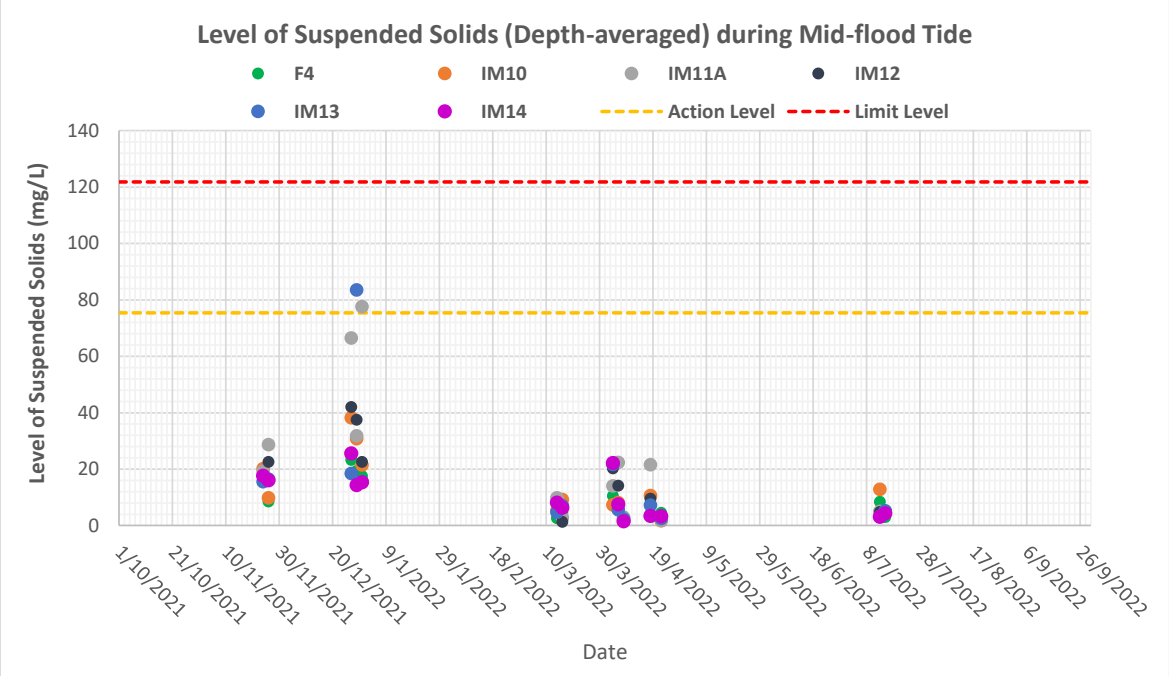


Figure F8j: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F4) and impact stations (IM10-IM14) under Group 4 during mid-flood tides between October 2021 and September 2022

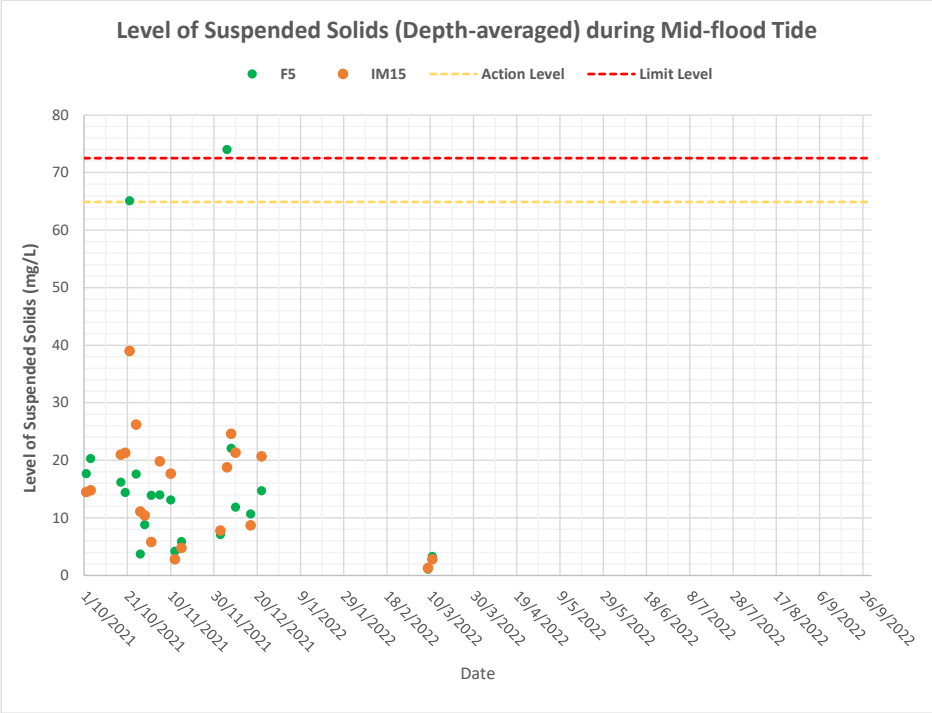


Figure F8k: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F5) and impact station (IM15) under Group 5 during mid-flood tides between October 2021 and September 2022

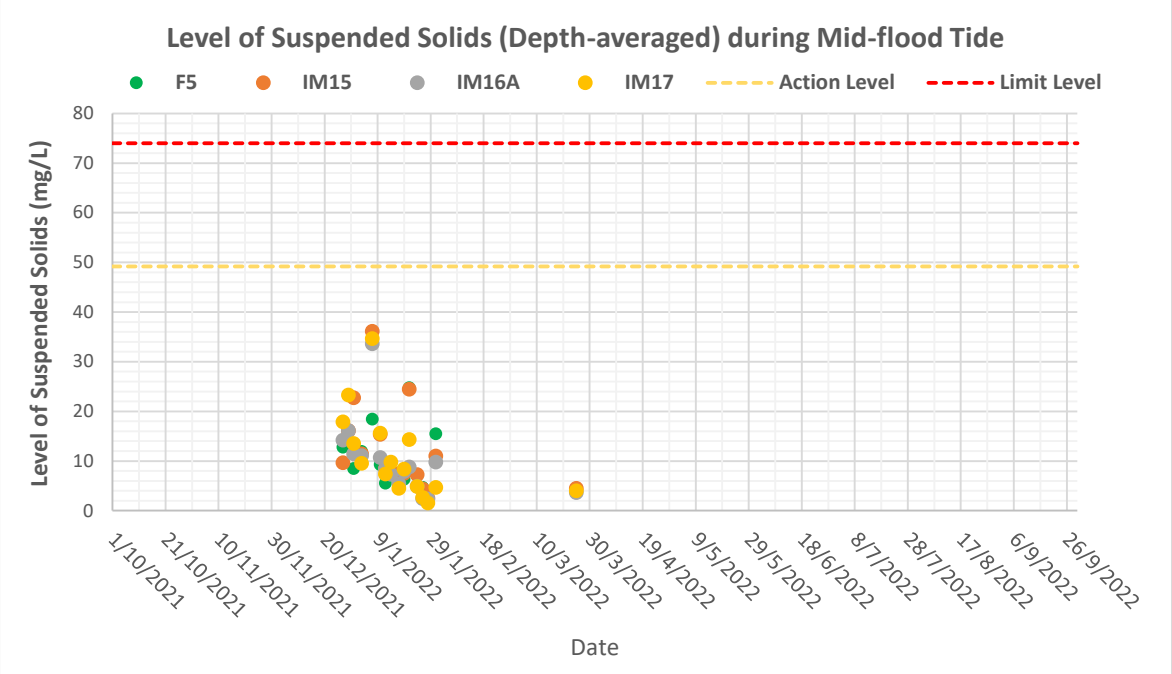


Figure F8l: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F5) and impact station (IM15) under Group 6 during mid-flood tides between October 2021 and September 2022

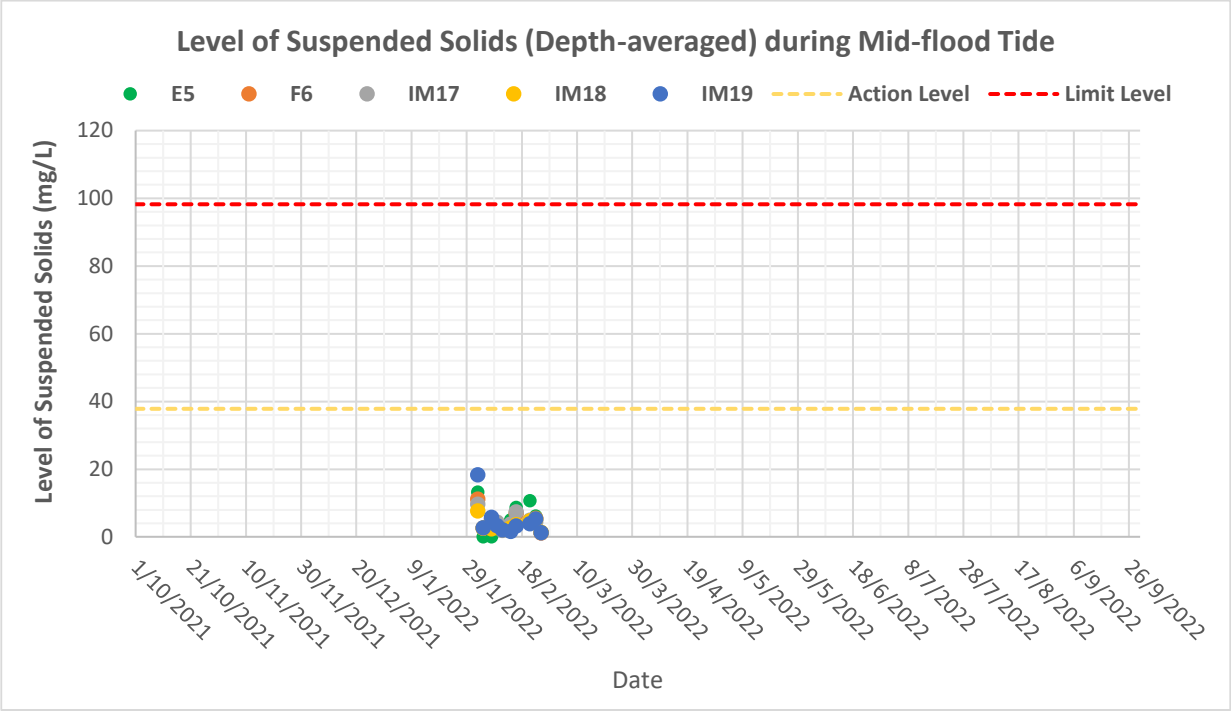


Figure F8m: Levels of Depth-averaged Suspended Solids (mg/L) at control stations (E5, F6) and impact stations (IM17-IM19) under Group 7 during mid-flood tides between October 2021 and September 2022

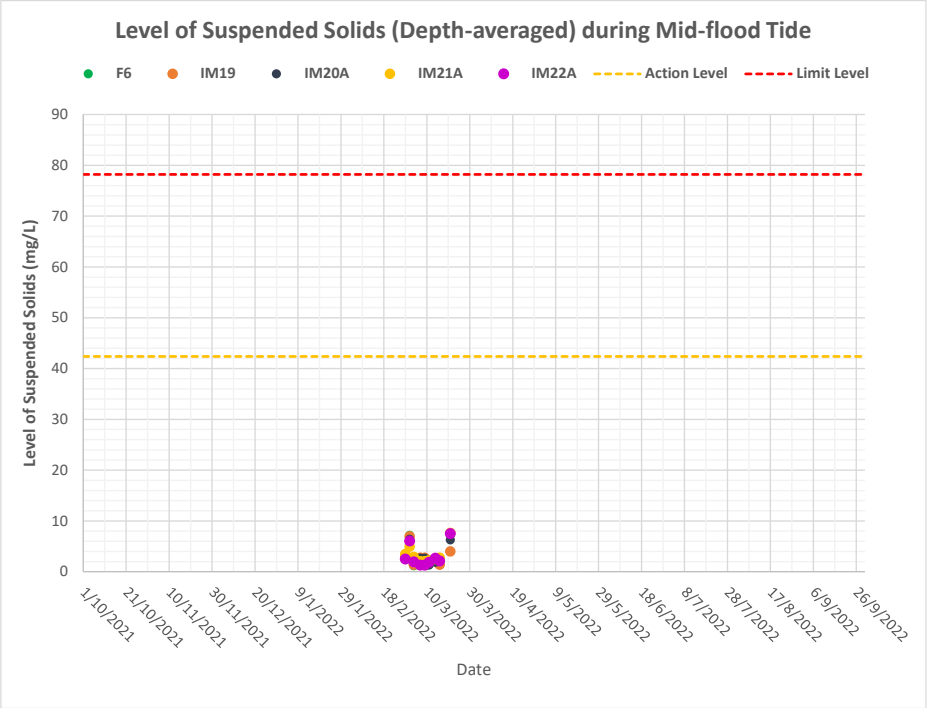


Figure F8n: Levels of Depth-averaged Suspended Solids (mg/L) at control station (F6) and impact stations (IM19-IM22A) under Group 8 during mid-flood tides between October 2021 and September 2022

Annotations:

- Key marine-based activities of the Project undertaken for construction of BPPS Pipeline included:
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 3 on 3 to 7 and 10 to 16 December 2021, 1 to 4, 9 to 30 January, 3 to 10, 12 to 16, 18 to 24, 26, 28 February, 1 to 14 and 17 to 31 March, 1, 10 to 12, 25 to 26 and 29 to 30 April, and 1 to 16 May 2022;
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 4 on 20, 24 to 28 November (1), 23 to 31 December 2021 (2), 13 to 18 March, 4 to 9, 18 to 19 and 22 to 23 April 2022;
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 5 on 1 to 4 ,18 to 30 October (3), 1, 4 to 7, 10 to 16 November, 3 to 8, 10 to 12, 17 to 19 and 21 to 22 December 2021 (4), 7 to 12 March 2022;
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 6 on 24 to 31 December 2021 (5), 1 to 4, 7 to 12, 14 to 30 January and 24 to 26 March 2022;
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 7 on 1 to 17 and 23 to 25 February 2022; and
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 8 on 26 to 28 February and 1 to 22 March 2022.
- Key marine-based activities of the Project undertaken for construction of LPS Pipeline included:
  - post-trenching works in terms of jetting operation in the vicinity of marine water quality monitoring stations under Group 2 on 1 to 2 October, 5 to 6 November, 3 to 8, 24 and 25 December 2021 (6), 8 to 19, 23 to 26, 28 to 30 January, 4, 5, 9 to 14, 27, 28 February and 1 to 6 March 2022 (7).
- Marine water quality monitoring was conducted at monitoring stations i) under Group 2 on 2 October, 5 November, 3, 6 and 24 December 2021 (7); ii) under Group 3 on 3, 6, 10, 13 and 15 December 2021 (8); iii) under Group 4 on 24, 26 November, 27, 29 and 31 December 2021; iv) under Group 5 on 2, 4, 18, 20, 22, 25, 27, 29 October, 1, 5, 10, 12 and 15 November, 3, 6, 8, 10, 17 and 22 December 2021; and v) under Group 6 on 27, 29 and 31 December 2021.
- Marine water quality monitoring was conducted at monitoring stations i) under Group 2 on 10, 12, 14, 17, 19, 24, 26, 28 January, 4, 9, 11, 14, 28 February, 2, 4 and 7 March 2022 (9)(10); ii) under Group 3 on 3, 10, 12, 14, 17, 19, 21, 24, 26, 28 January, 2, 4, 7, 9, 11, 14, 16, 18, 21, 23, 25, 28 February, 2, 4, 7, 9, 11, 14, 21, 23, 25, 28 and 30 March 2022 (10)(11)(12); iii) under Group 4 on 14 and 16 March 2022 (13); iv) under Group 5 on 9 and 11 March 2022; v) under Group 6 on 3, 7, 10, 12, 14, 17, 19, 21, 24, 26, 28, 31 January and 25 March 2022 (14); vi) under Group 7 on 2, 4, 7, 9 ,11, 14, 16, 18, 21, 23, 25 and 28 February 2022 (12); and vii) under Group 8 on 28 February, 2, 4, 7, 9, 11, 14, 16 and 21 March 2022 (13).
- Marine water quality monitoring was conducted at monitoring stations i) under Group 3 on 1, 11, 25, 29 April, 2, 4, 6, 9, 11, 13 and 16 May 2022; (ii) under Group 4 on 4, 6, 8, 18 and 22 April 2022.
- Weather conditions during the monitoring period ranged from fine to rainy, with sea conditions ranged from calm to rough. Detailed meteorological conditions can be referred to *Annex G of the associated Monthly EM&A Reports* for the reporting period.
- No special phenomena and/or other factors which might affect the monitoring results were observed and recorded during the monitoring period.

Notes:

(1) Preparation works for marine jetting operation in the vicinity of Adamasta Channel was undertaken on 20 November 2021.
(2) Preparation works for marine jetting operation in the vicinity of Adamasta Channel was undertaken on 23 and 24 December 2021.
(3) No marine jetting operation was undertaken between 5 and 17 October 2021, and marine WQM was resumed to be conducted since 18 October 2021.
(4) No marine jetting operation was undertaken on 20 December 2021 and water quality monitoring was not conducted on 20 December 2021.
(5) Preparation works for marine jetting operation in the vicinity of West of HKIA to Lung Kwu Chau was undertaken on 24 December 2021.
(6) No marine jetting operation was undertaken on 8 December 2021 and water quality monitoring was not conducted on 8 December 2021.
(7) Only preparation works for marine jetting operation were conducted between 8 and 19 January 2022.
(8) Monitoring station, IM6, was occupied by a crane barge during the monitoring events since 27 August 2021. Therefore, the monitoring station was shifted to the nearest practicable location.
(9) Marine water quality monitoring for Group 2 scheduled on 14 January 2022 was cancelled due to adverse weather.
(10) Marine water quality monitoring for Group 2 and Group 3 scheduled on 11 February 2022 was cancelled as the sampling team had to arrange COVID-19 tests and conduct disinfection on the survey vessel on 10-11 February 2022 due to potential COVID-19 confirmed cases on the survey vessel.
(11) Marine water quality monitoring for Group 3 scheduled on 7 February 2022 was cancelled due to adverse weather.
(12) Marine water quality monitoring for Group 3 and Group 7 scheduled on 18 February 2022 was cancelled due to adverse weather.
(13) Marine water quality monitoring for Group 3, Group 4 and Group 8 scheduled on 18 March 2022 was cancelled due to adverse weather.
(14) Marine water quality monitoring was scheduled to be carried out on 31 January 2022 for the 24-hr marine jetting operation for 30 January 2022 which was completed during daytime period of the next day.

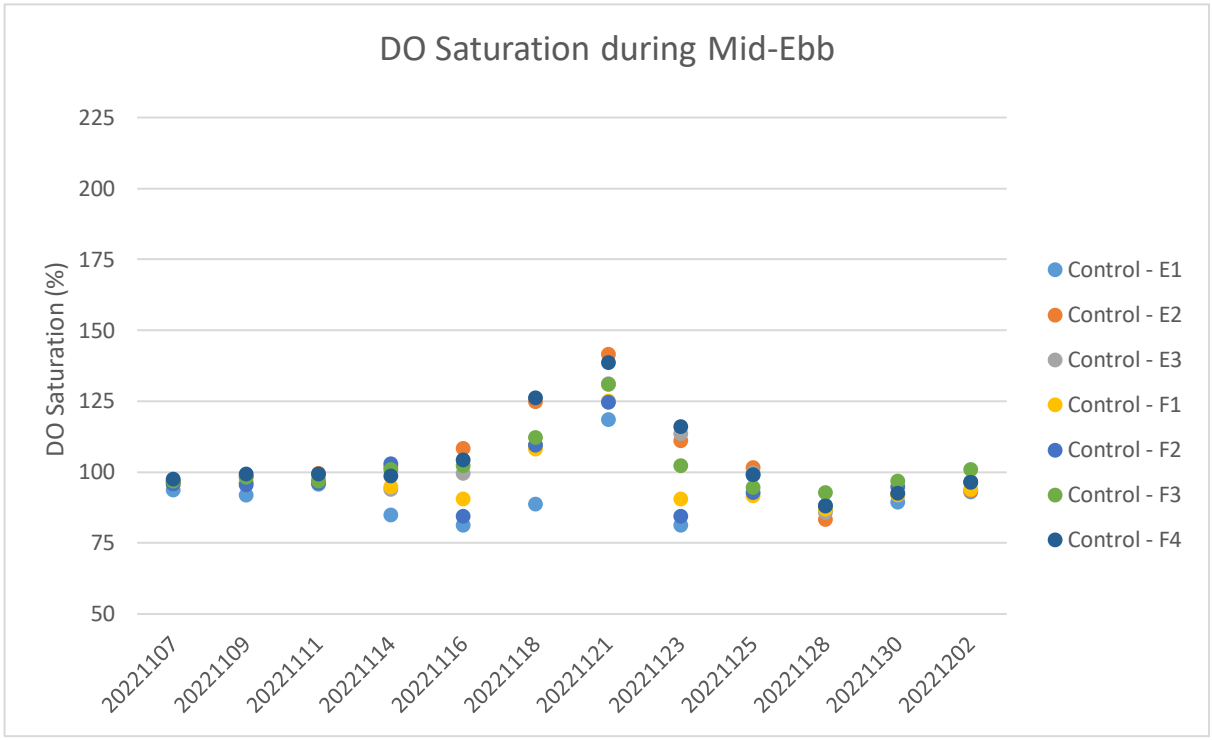


Figure F9a: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-ebb tides between 7 November and 2 December 2022

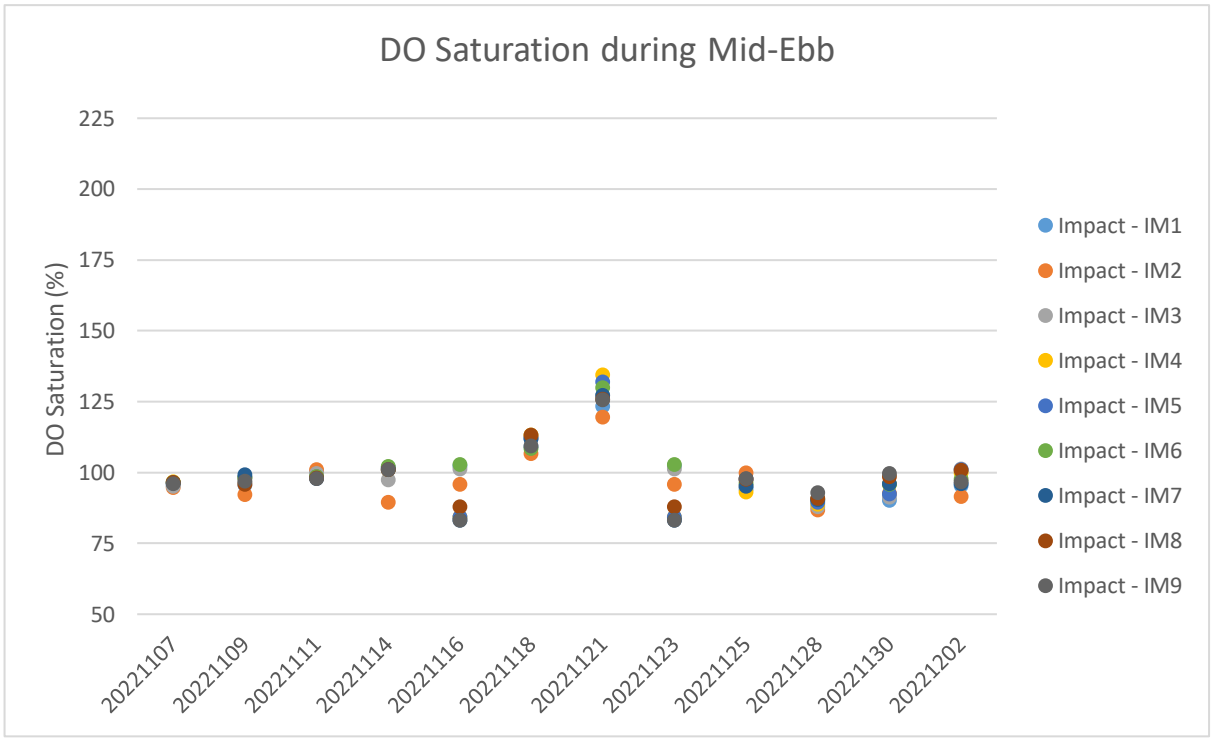


Figure F9b: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-ebb tides between 7 November and 2 December 2022

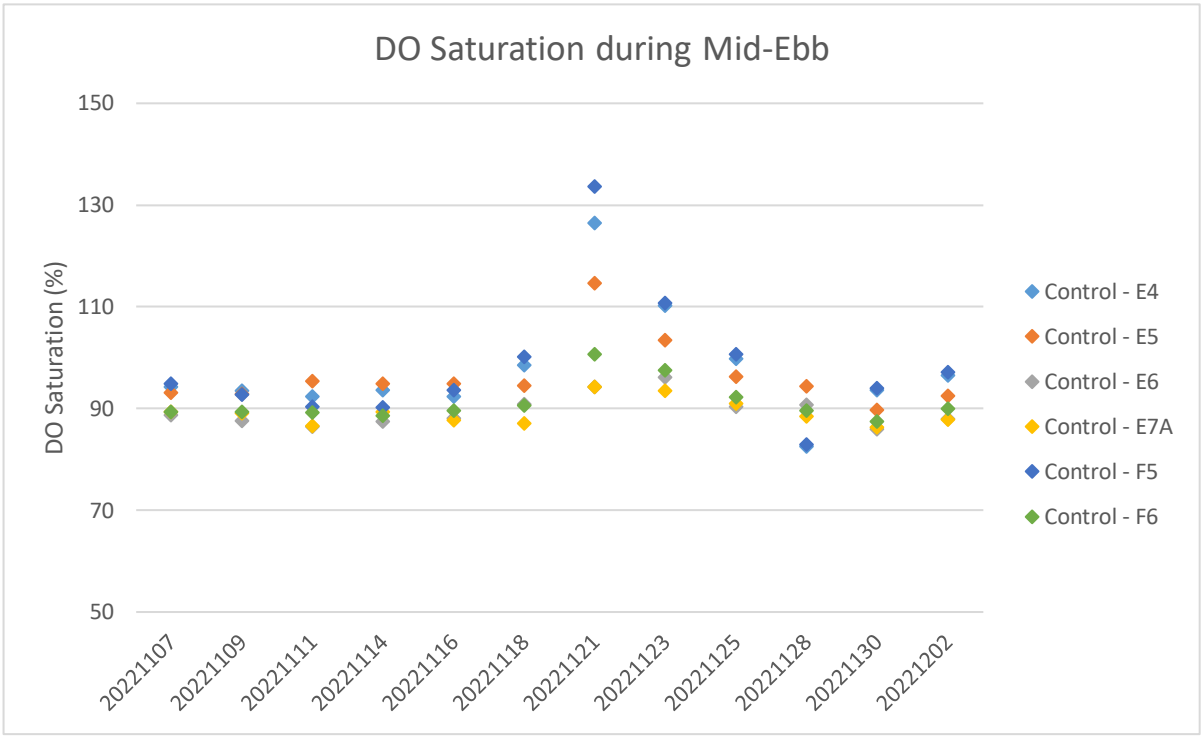


Figure F9c: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-ebb tides between 7 November and 2 December 2022

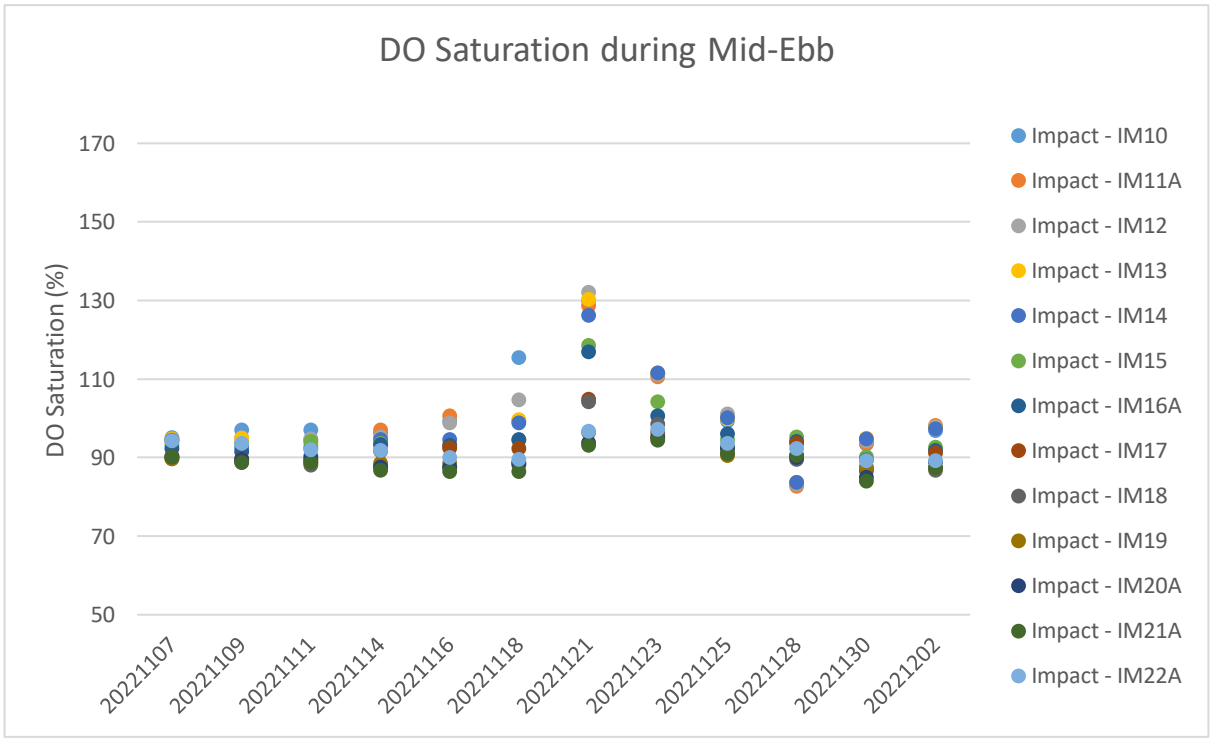


Figure F9d: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-ebb tides between 7 November and 2 December 2022

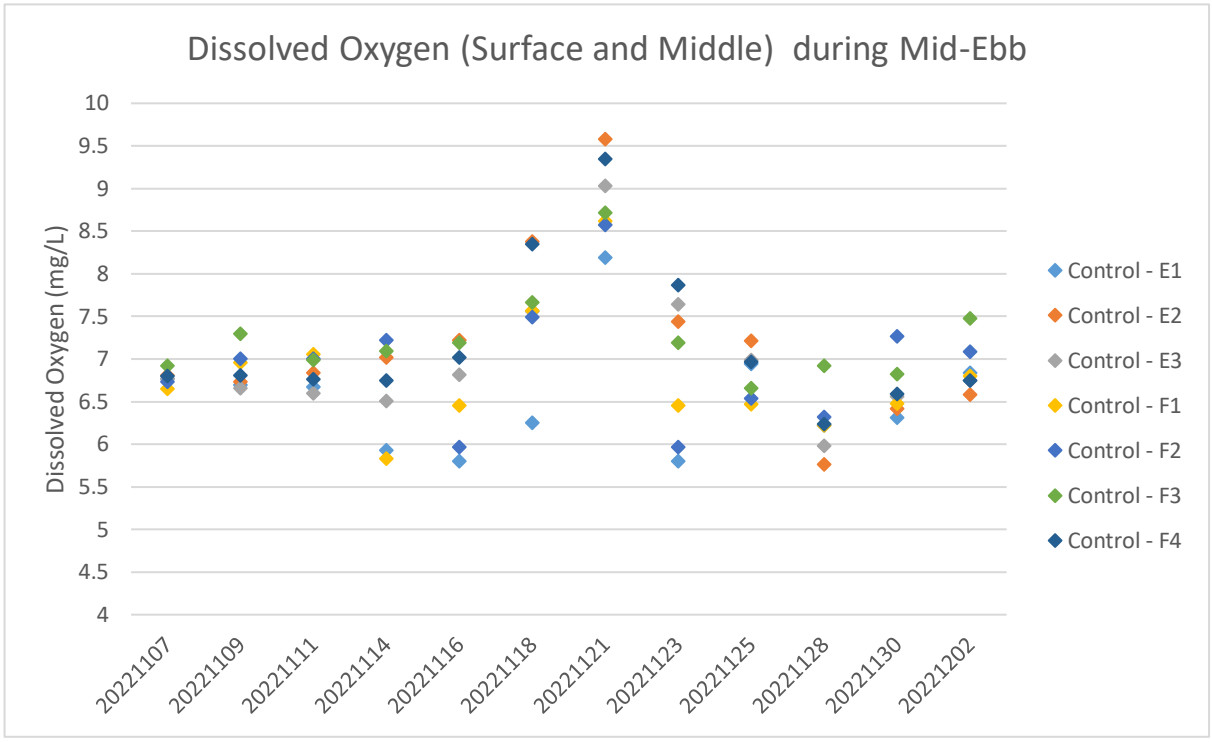


Figure F9e: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-ebb tides between 7 November and 2 December 2022

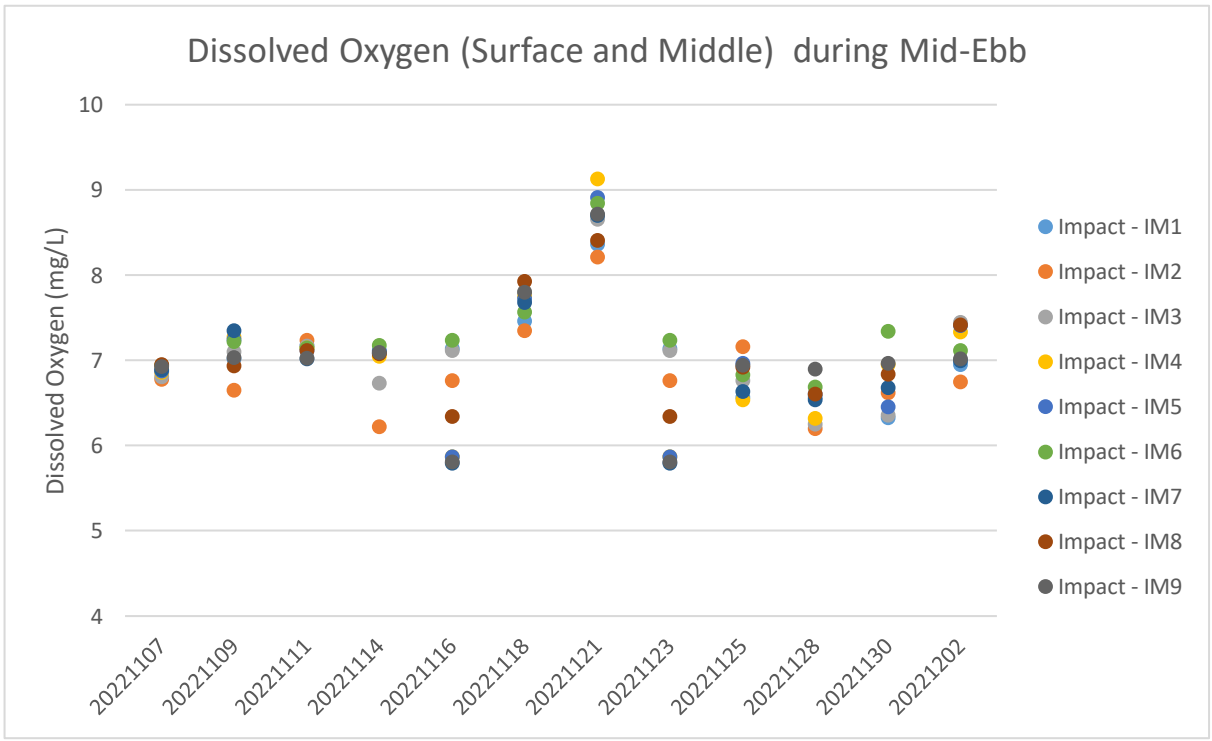


Figure F9f: Levels of Surface and Middle Dissolved Oxygen (mg/L) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-ebb tides between 7 November and 2 December 2022

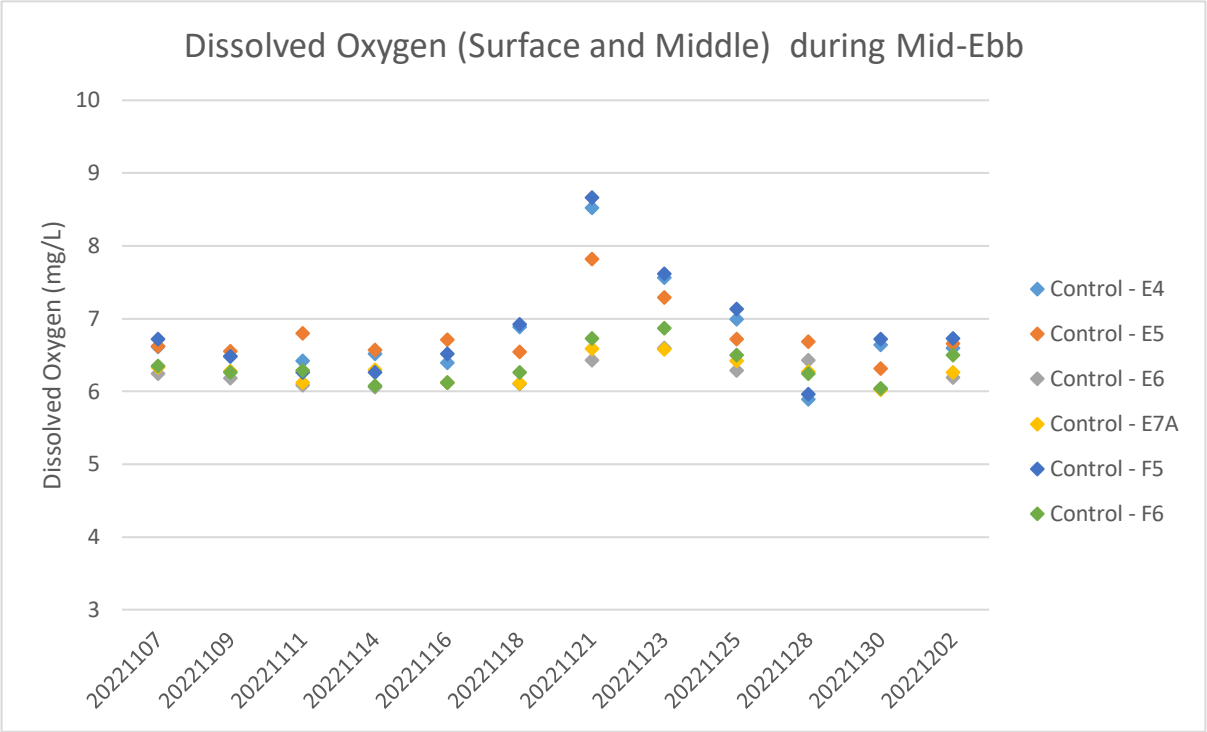


Figure F9g: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-ebb tides between 7 November and 2 December 2022

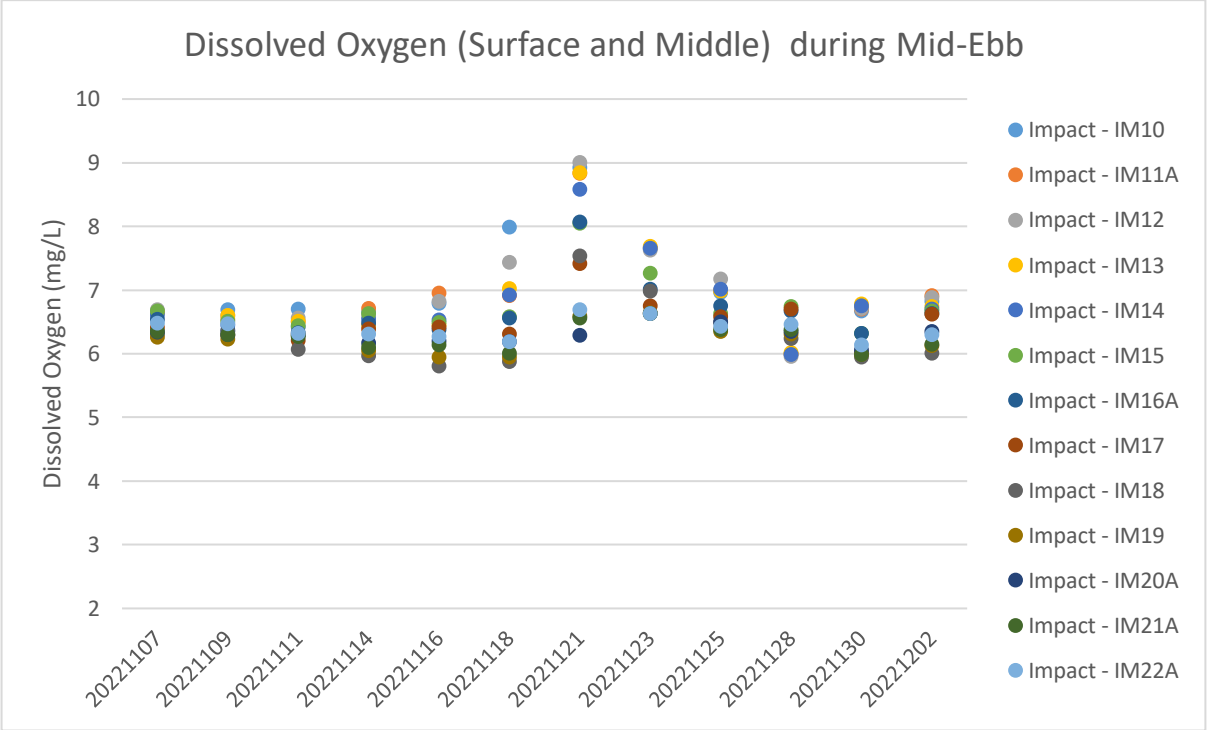


Figure F9h: Levels of Surface and Middle Dissolved Oxygen (mg/L) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-ebb tides between 7 November and 2 December 2022

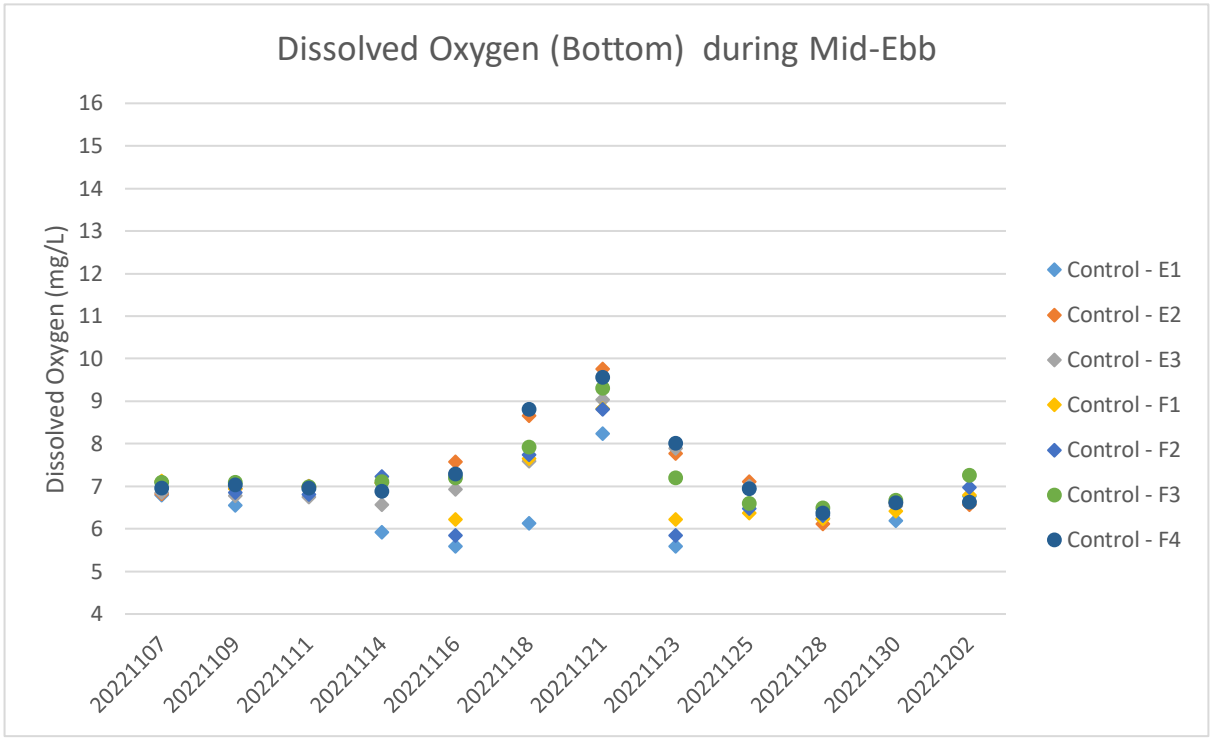


Figure F9i: Levels of Bottom Dissolved Oxygen (mg/L) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-ebb tides between 7 November and 2 December 2022

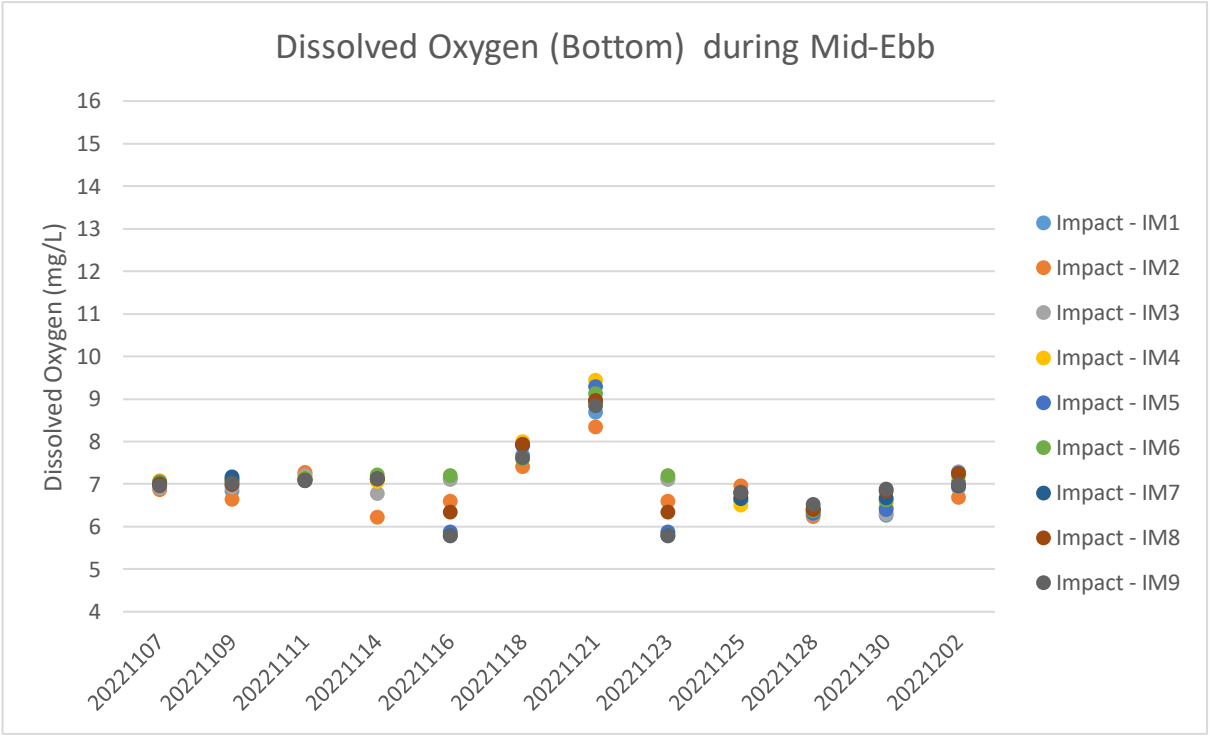


Figure F9j: Levels of Bottom Dissolved Oxygen (mg/L) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-ebb tides between 7 November and 2 December 2022

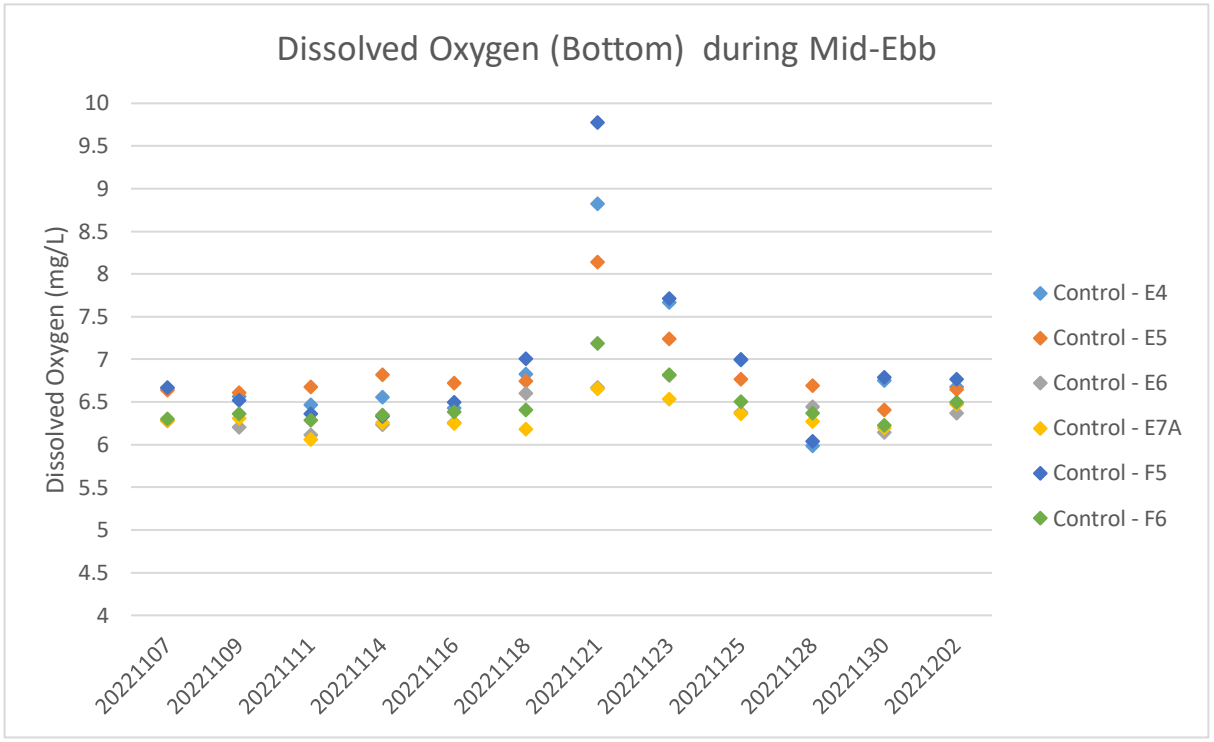


Figure F9k: Levels of Bottom Dissolved Oxygen (mg/L) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-ebb tides between 7 November and 2 December 2022

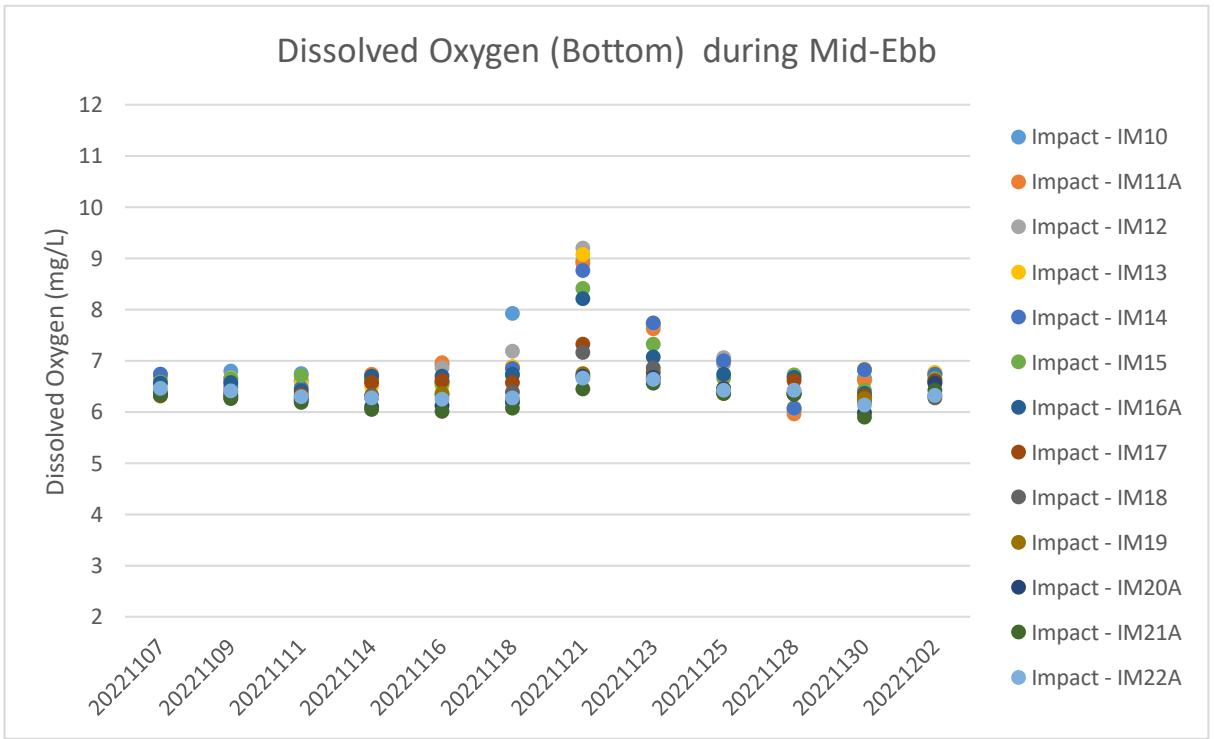


Figure F9l: Levels of Bottom Dissolved Oxygen (mg/L) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-ebb tides between 7 November and 2 December 2022

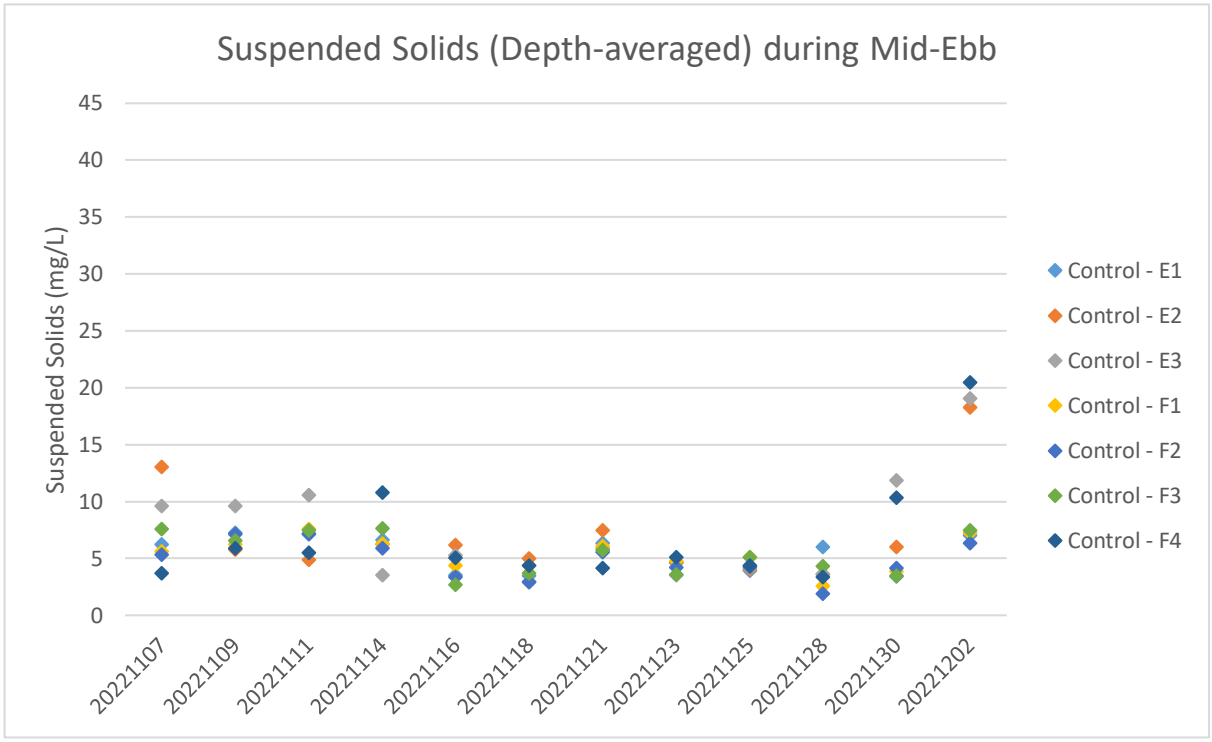


Figure F9m: Levels of Depth-averaged Suspended Solids (mg/L) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-ebb tides between 7 November and 2 December 2022

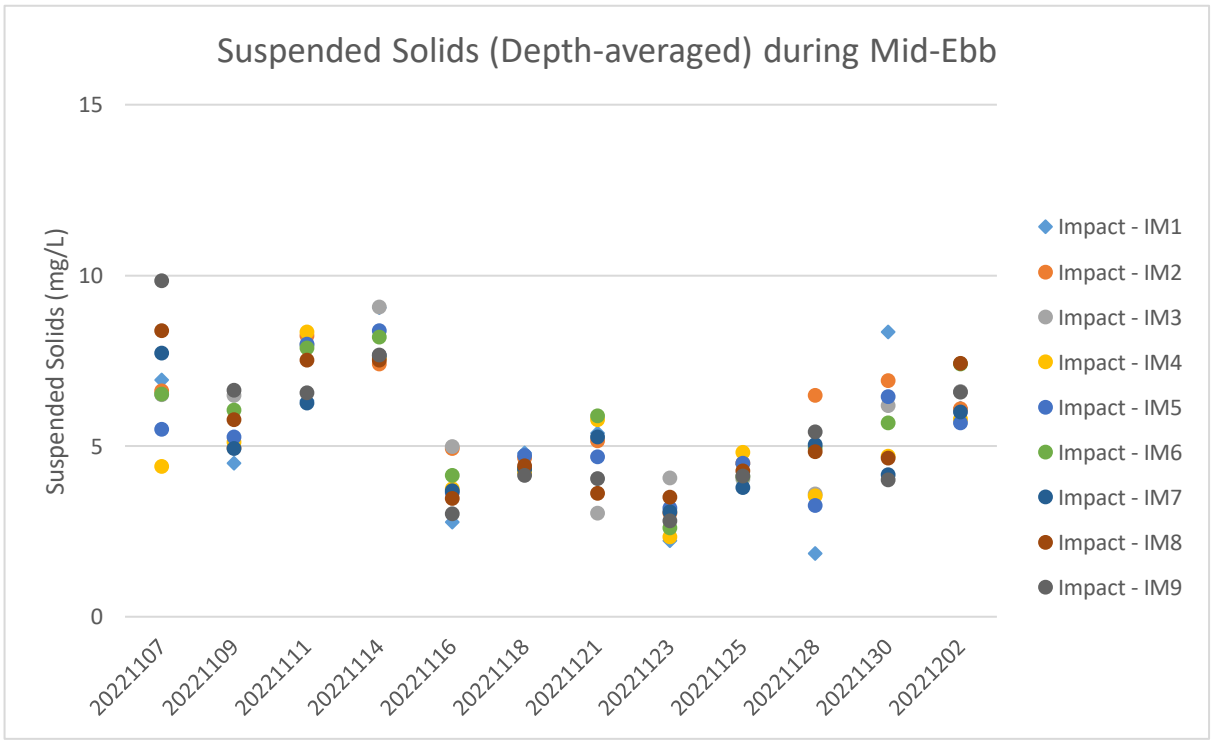


Figure F9n: Levels of Depth-averaged Suspended Solids (mg/L) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-ebb tides between 7 November and 2 December 2022

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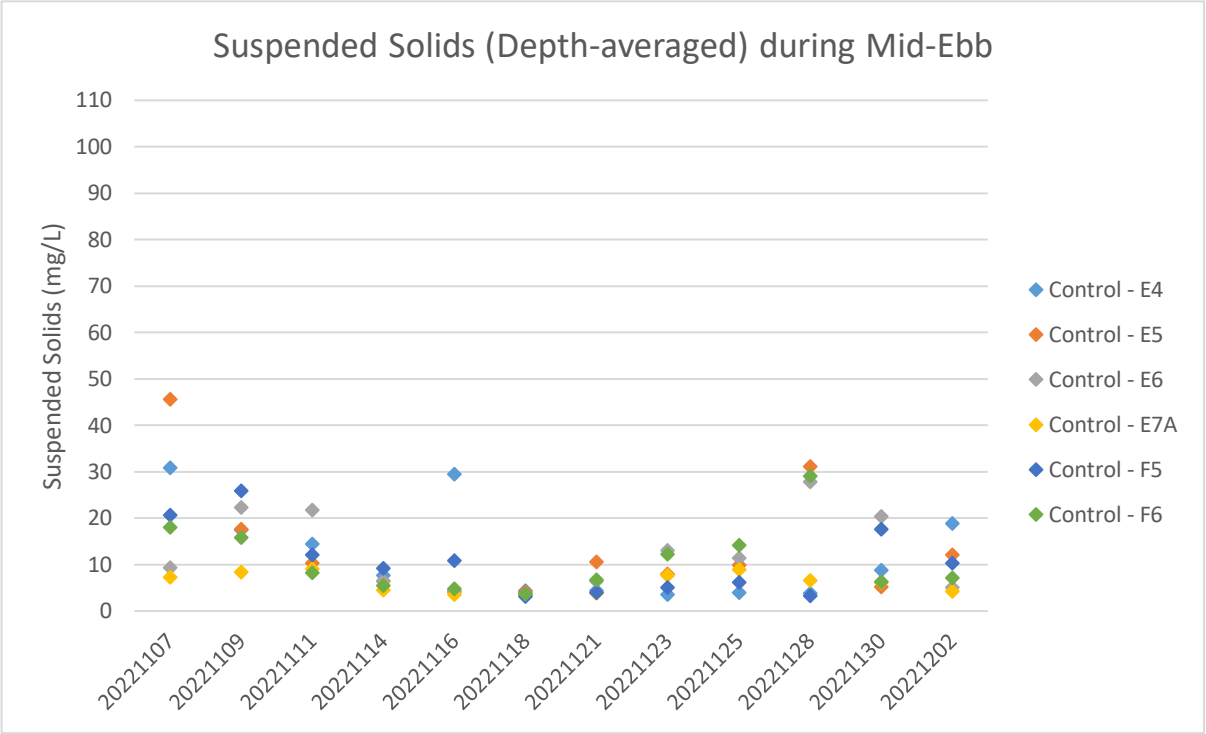

Figure F9o: Levels of Depth-averaged Suspended Solids (mg/L) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-ebb tides between 7 November and 2 December 2022

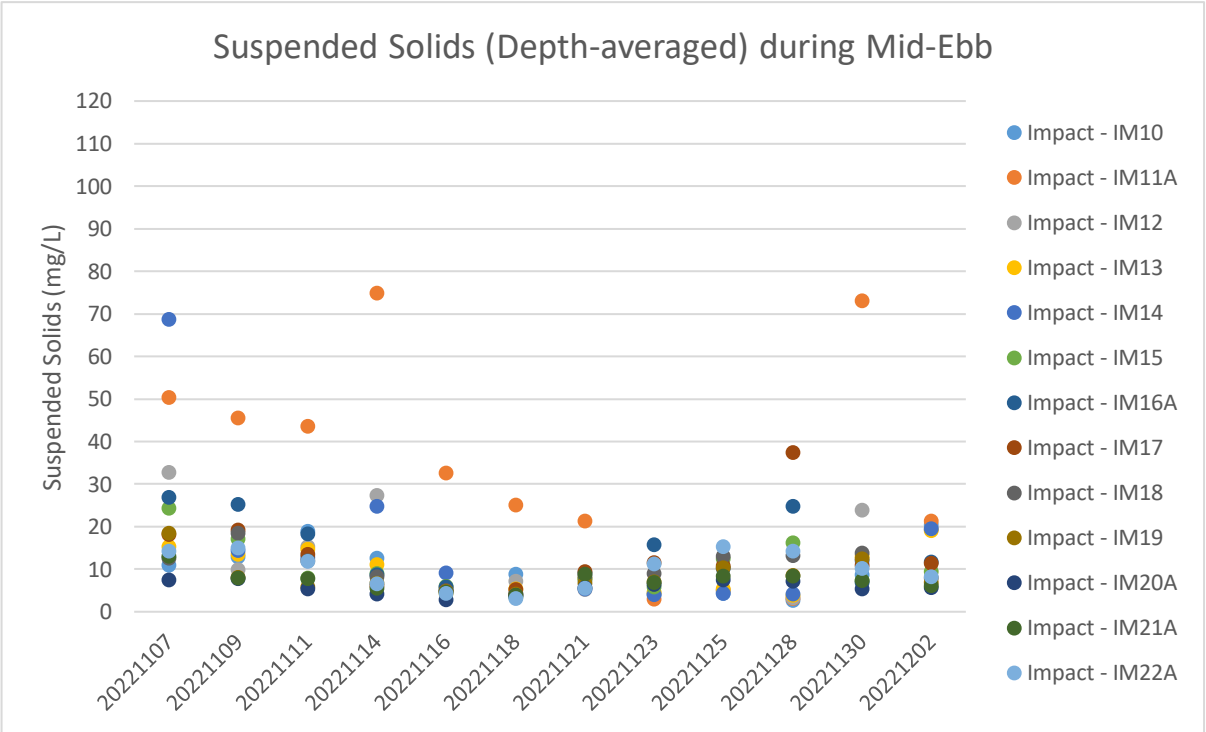

Figure F9p: Levels of Depth-averaged Suspended Solids (mg/L) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-ebb tides between 7 November and 2 December 2022

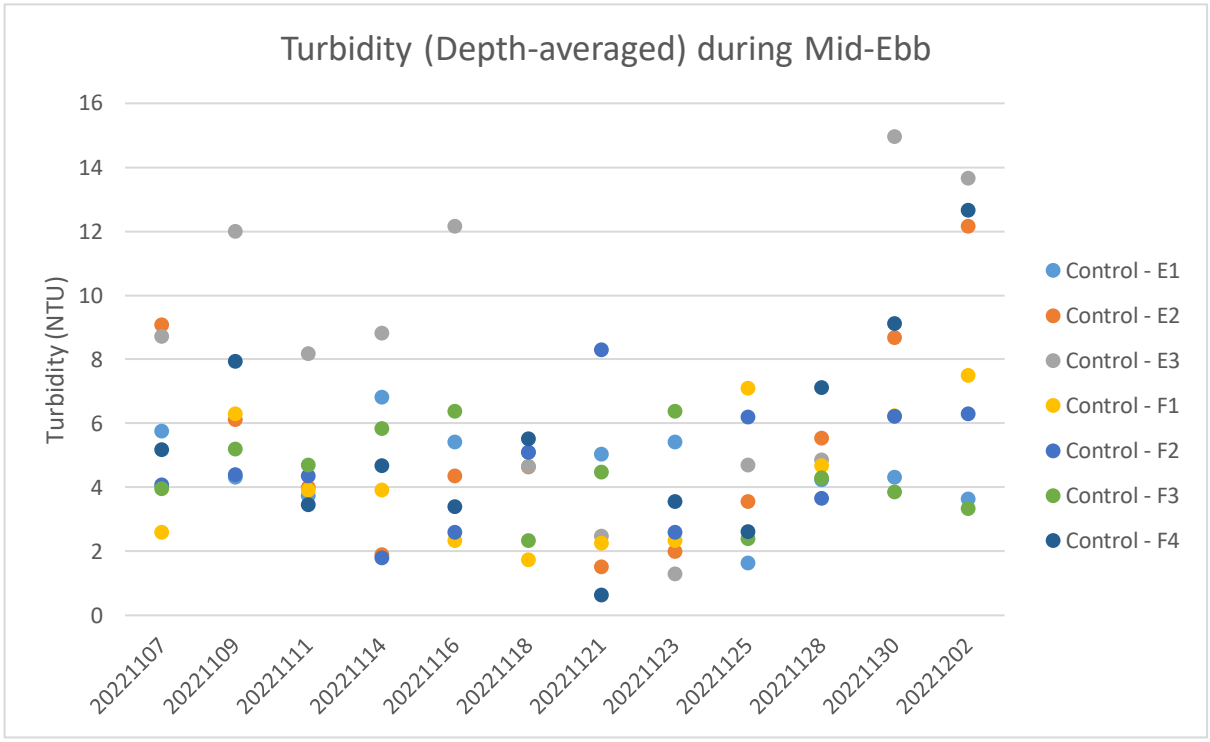

Figure F9q: Levels of Depth-averaged Turbidity (NTU) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-ebb tides between 7 November and 2 December 2022

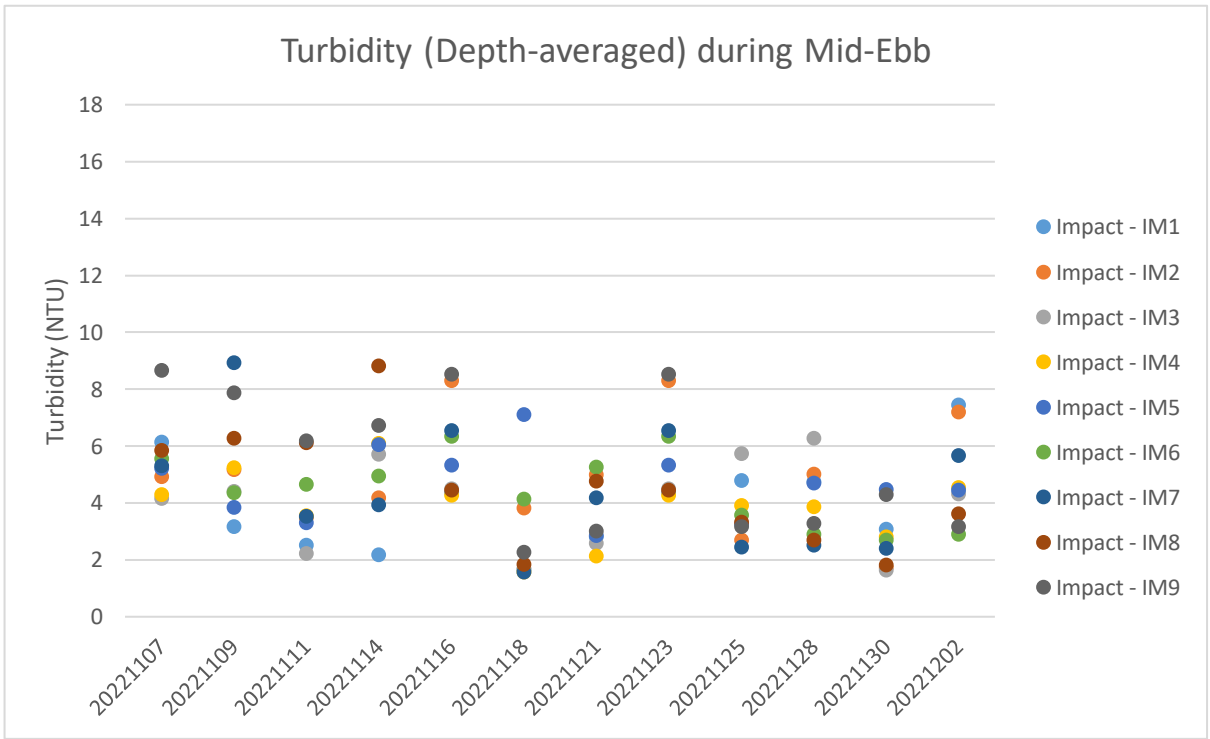

Figure F9r: Levels of Depth-averaged Turbidity (NTU) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-ebb tides between 7 November and 2 December 2022

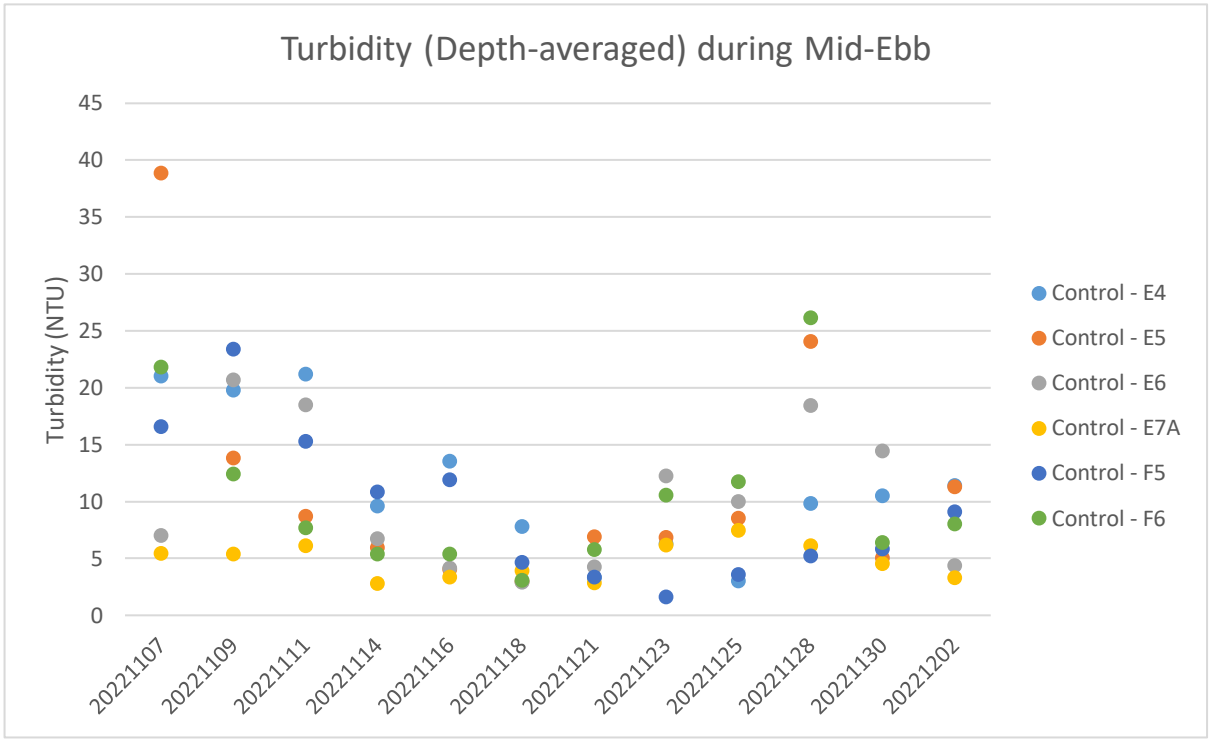

Figure F9s: Levels of Depth-averaged Turbidity (NTU) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-ebb tides between 7 November and 2 December 2022

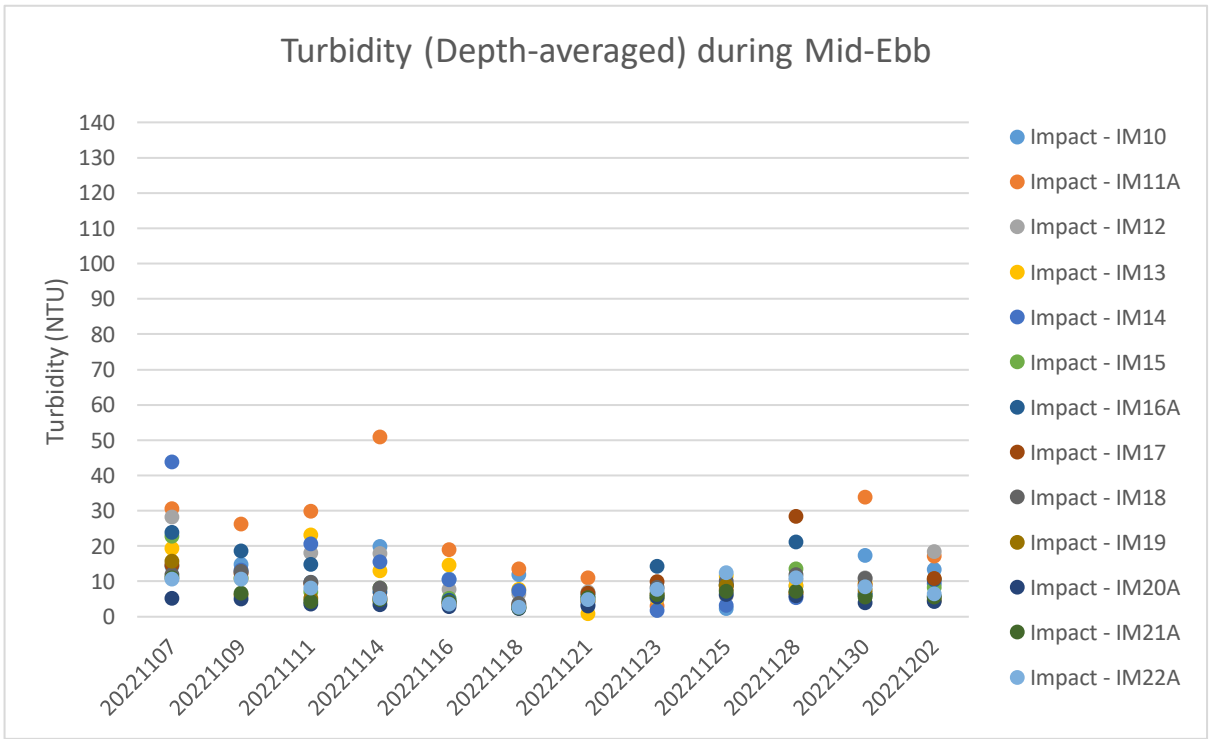

Figure F9t: Levels of Depth-averaged Turbidity (NTU) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-ebb tides between 7 November and 2 December 2022

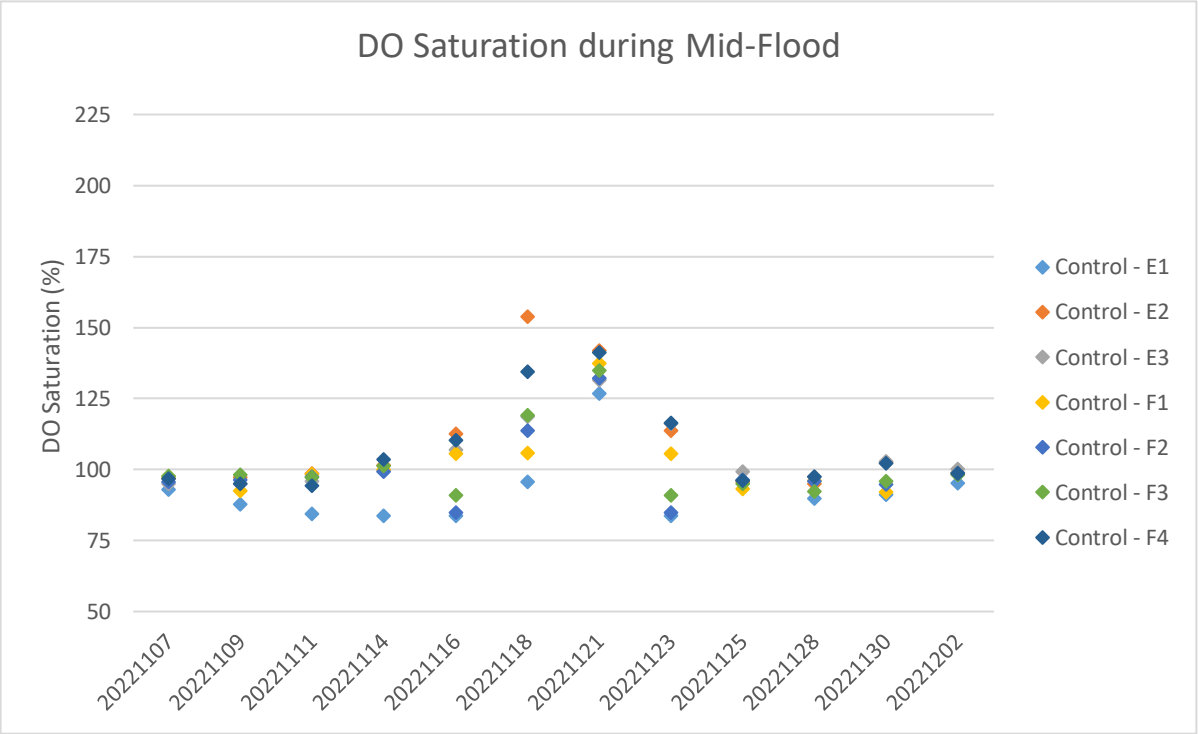

Figure F10a: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-flood tides between 7 November and 2 December 2022

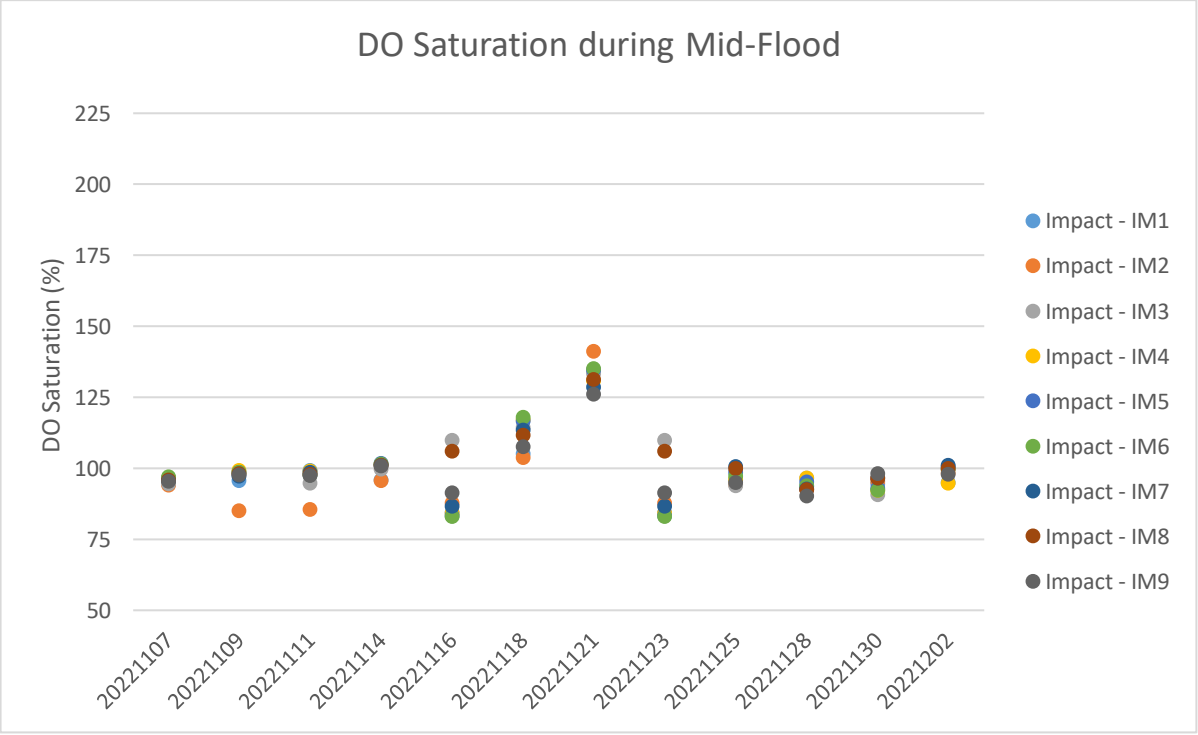

Figure F10b: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-flood tides between 7 November and 2 December 2022

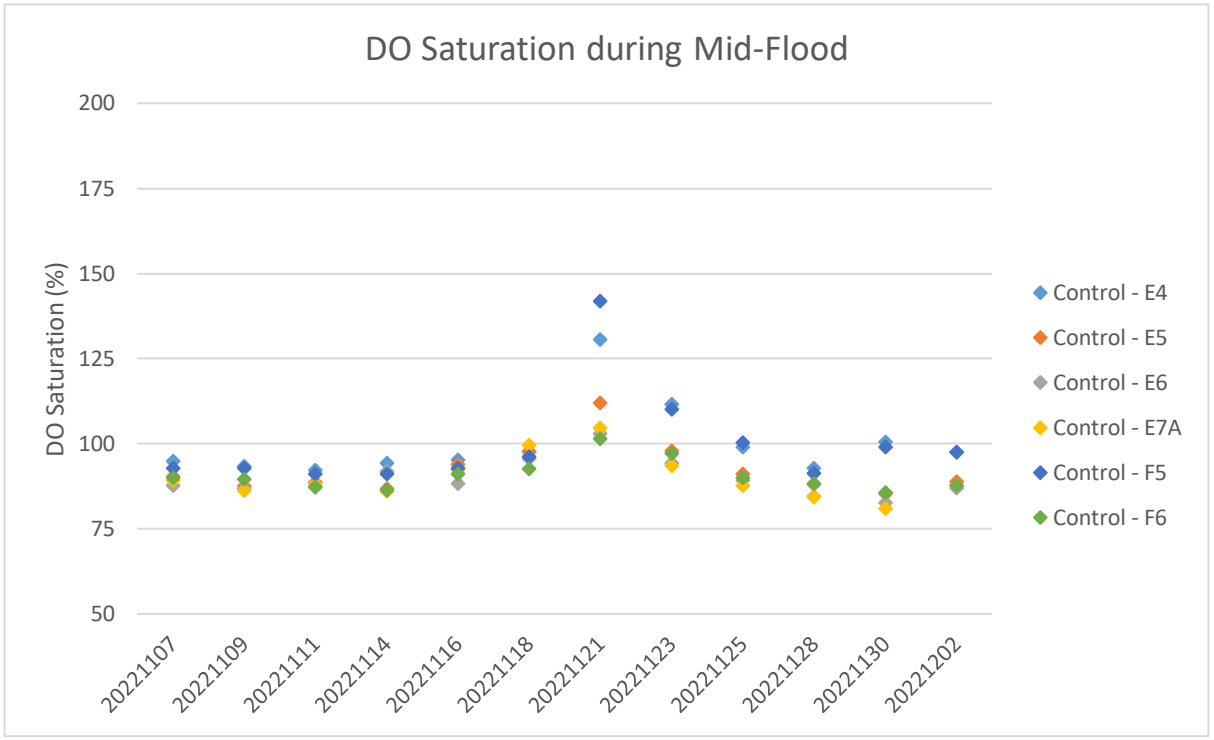

Figure F10c: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-flood tides between 7 November and 2 December 2022

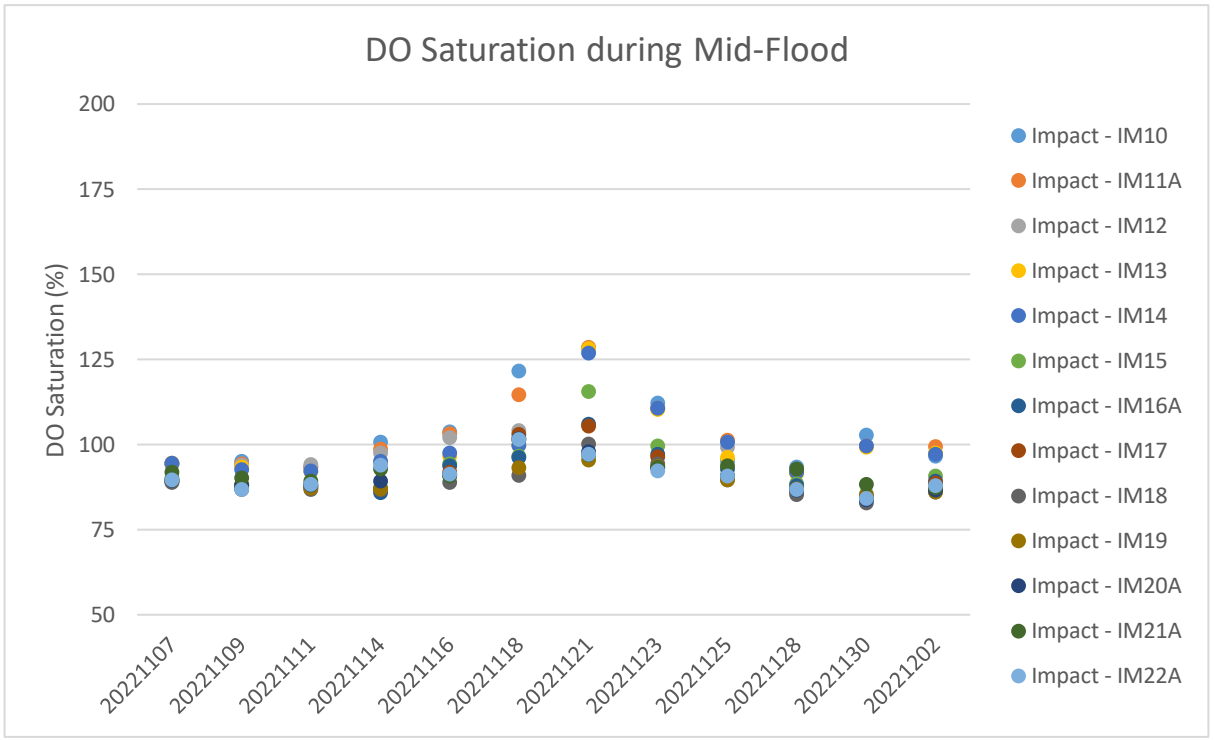

Figure F10d: Levels of Depth-averaged Dissolved Oxygen Saturation (%) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-flood tides between 7 November and 2 December 2022

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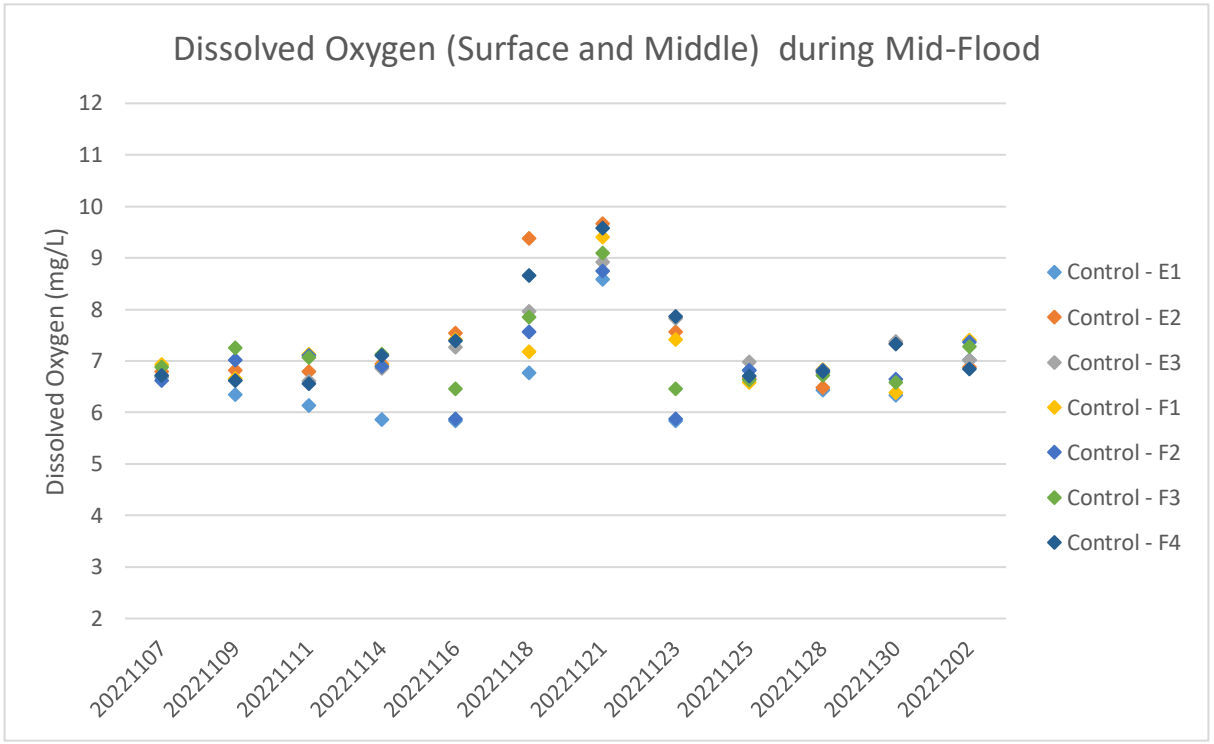

Figure F10e: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-flood tides between 7 November and 2 December 2022

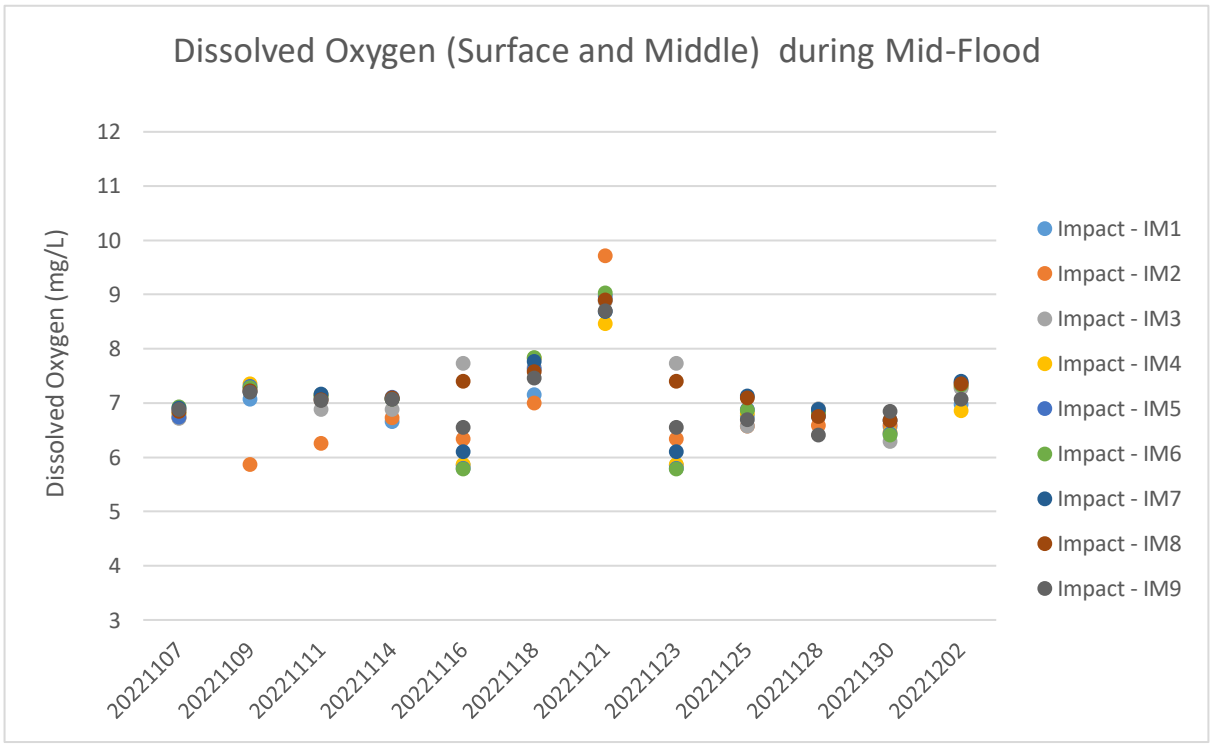

Figure F10f: Levels of Surface and Middle Dissolved Oxygen (mg/L) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-flood tides between 7 November and 2 December 2022

Source: P:\Projects\0505354 CLP Power Hong Kong Limited FSRU Pre-con EM&A.RC\07 Data\12 Post-Construction WQ

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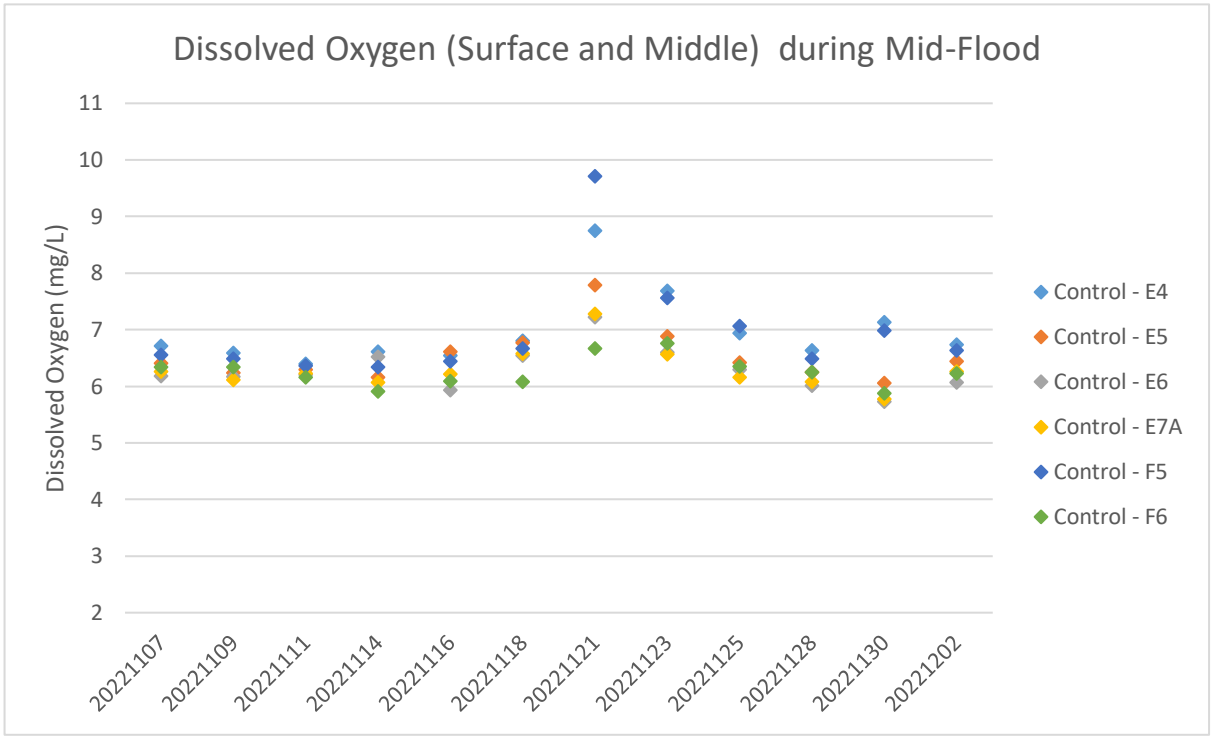

Figure F10g: Levels of Surface and Middle Dissolved Oxygen (mg/L) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-flood tides between 7 November and 2 December 2022

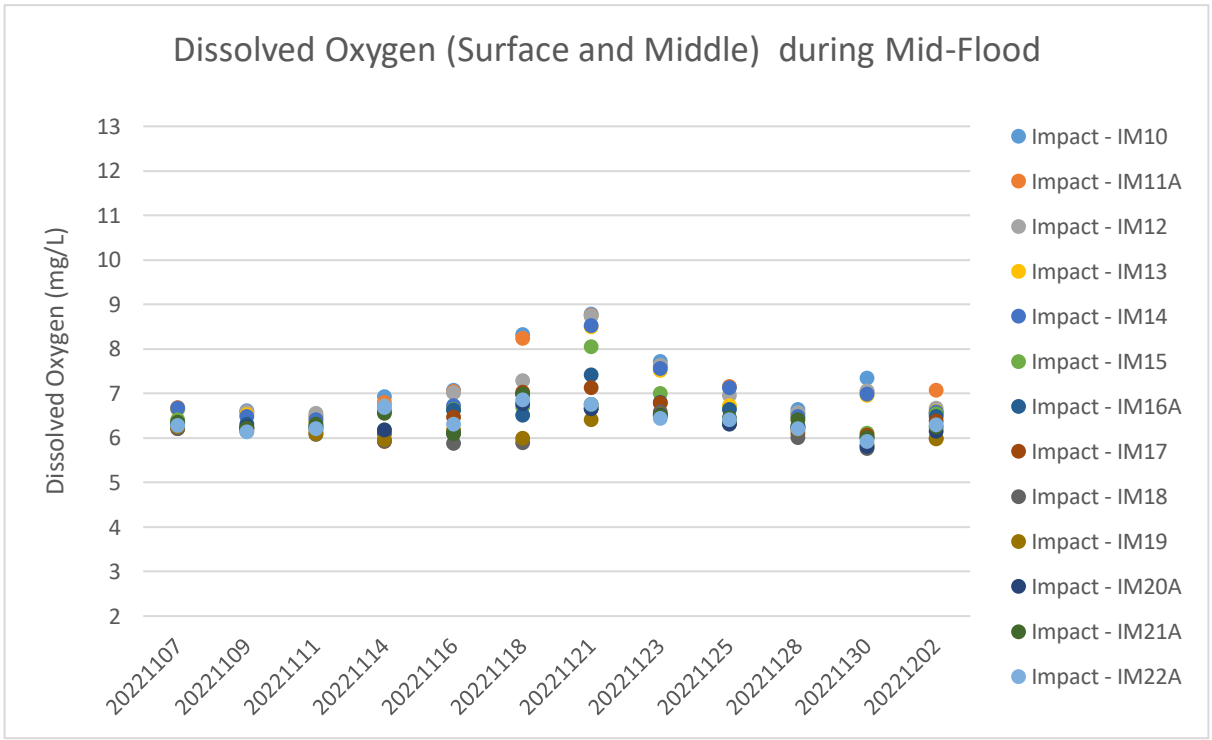

Figure F10h: Levels of Surface and Middle Dissolved Oxygen (mg/L) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-flood tides between 7 November and 2 December 2022

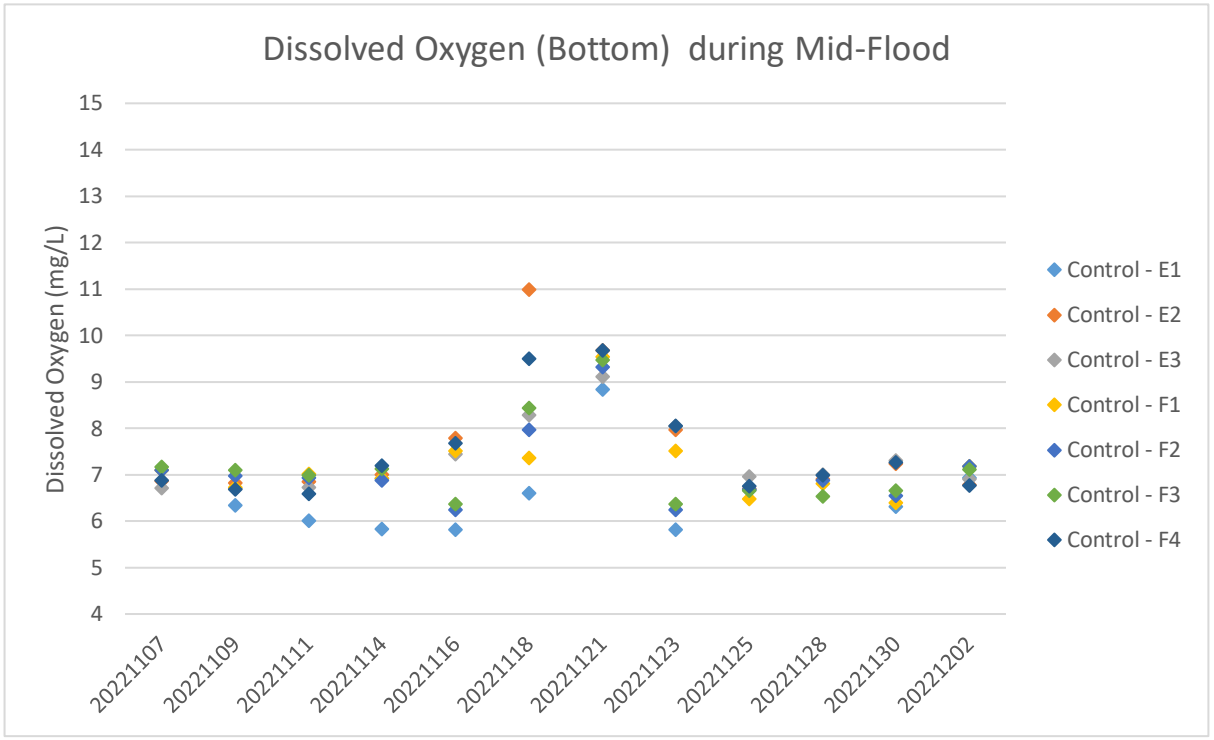

Figure F10i: Levels of Bottom Dissolved Oxygen (mg/L) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-flood tides between 7 November and 2 December 2022

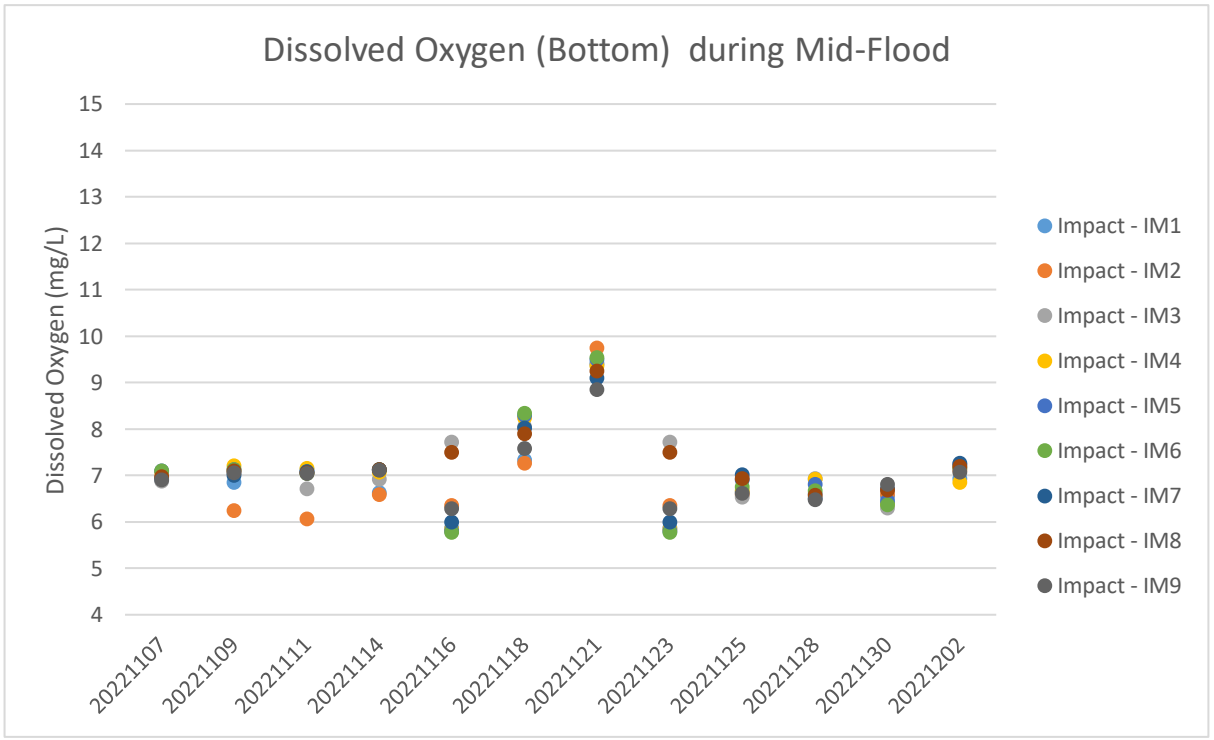

Figure F10j: Levels of Bottom Dissolved Oxygen (mg/L) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-flood tides between 7 November and 2 December 2022

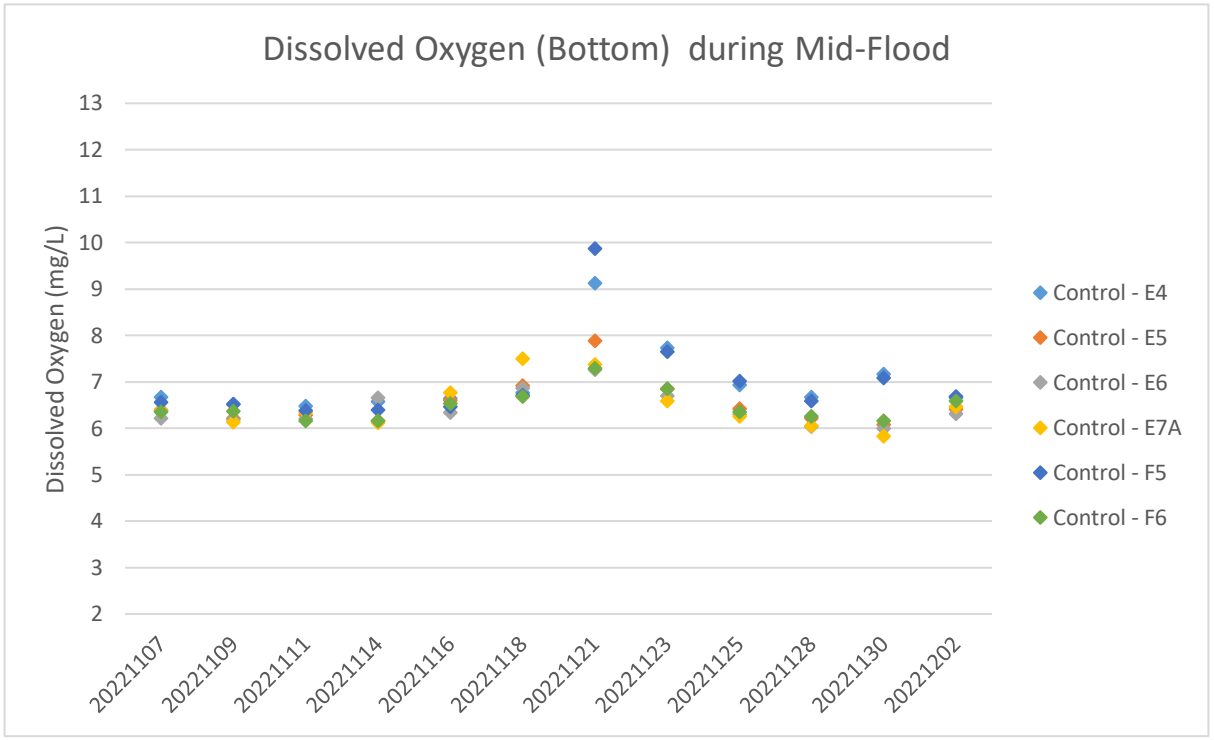

Figure F10k: Levels of Bottom Dissolved Oxygen (mg/L) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-flood tides between 7 November and 2 December 2022

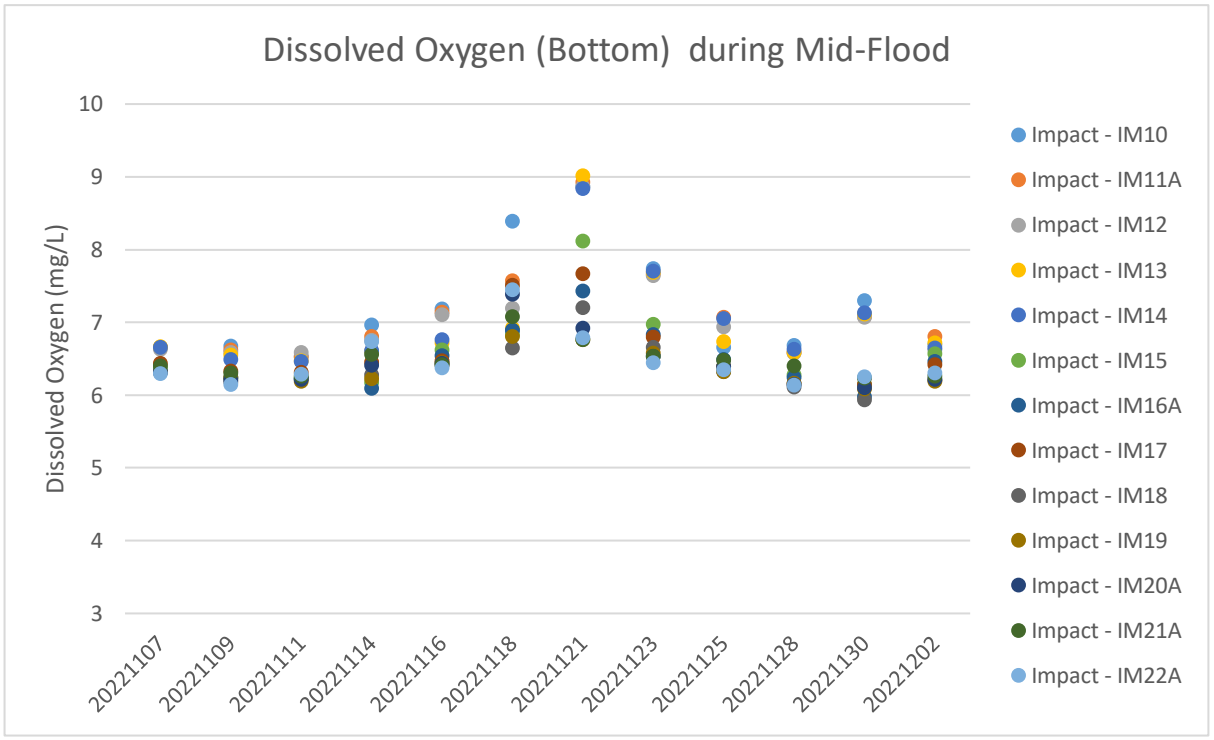

Figure F10l: Levels of Bottom Dissolved Oxygen (mg/L) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-flood tides between 7 November and 2 December 2022

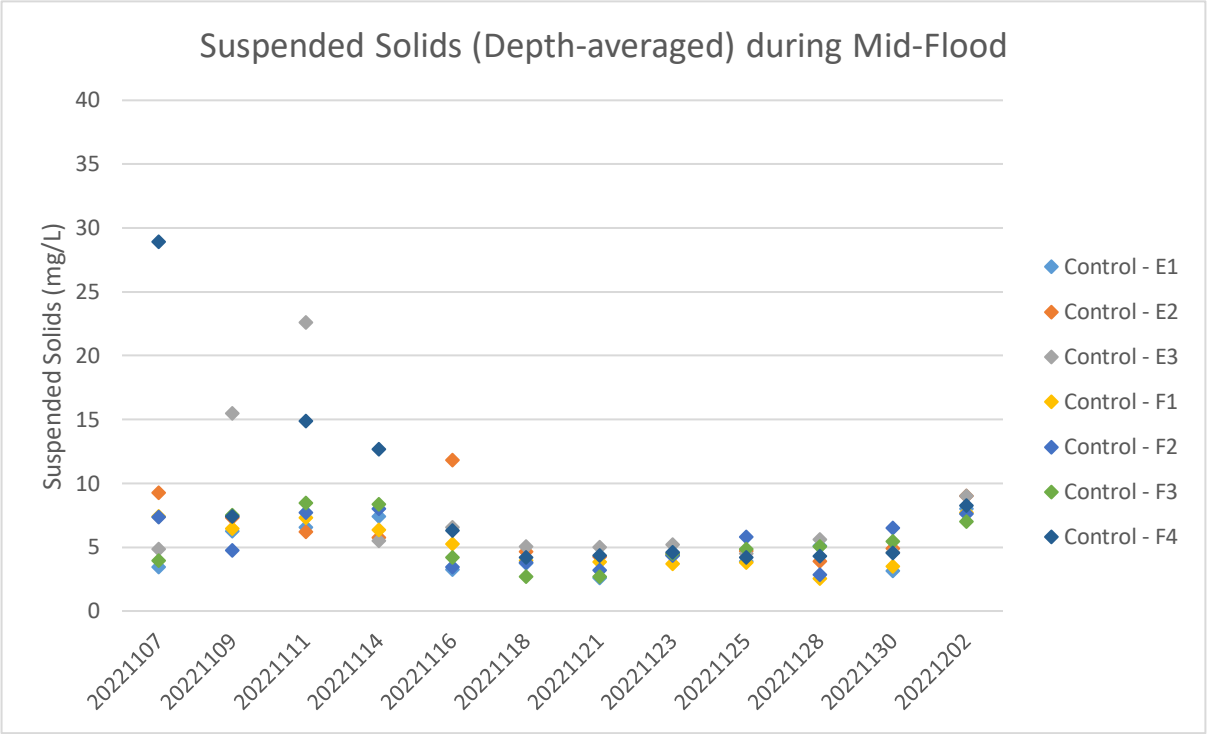

Figure F10m: Levels of Depth-averaged Suspended Solids (mg/L) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-flood tides between 7 November and 2 December 2022

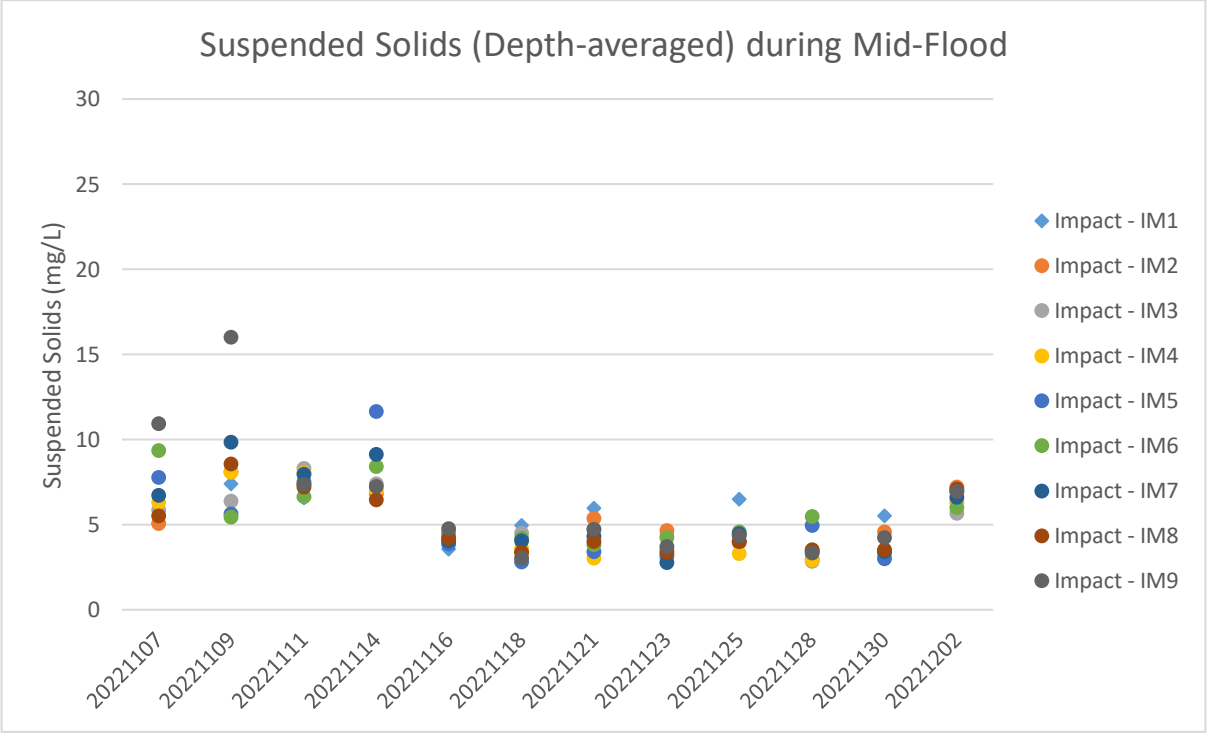

Figure F10n: Levels of Depth-averaged Suspended Solids (mg/L) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-flood tides between 7 November and 2 December 2022

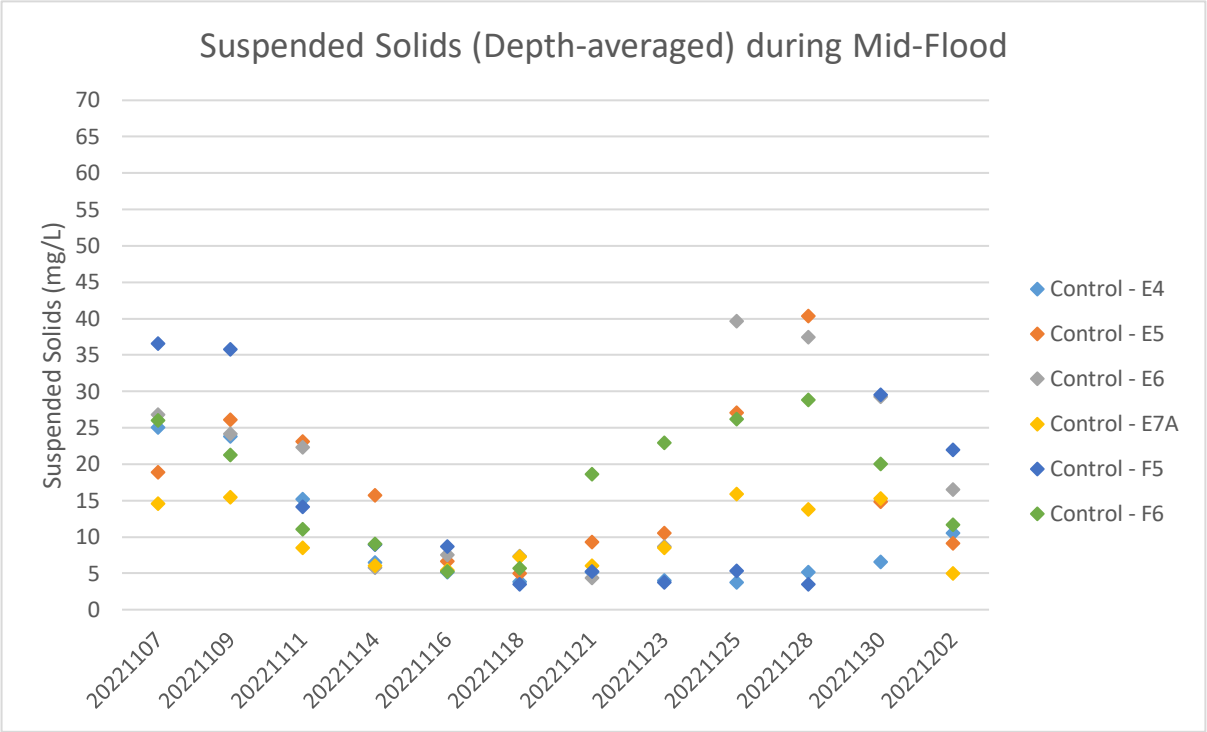

Figure F10o: Levels of Depth-averaged Suspended Solids (mg/L) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-flood tides between 7 November and 2 December 2022

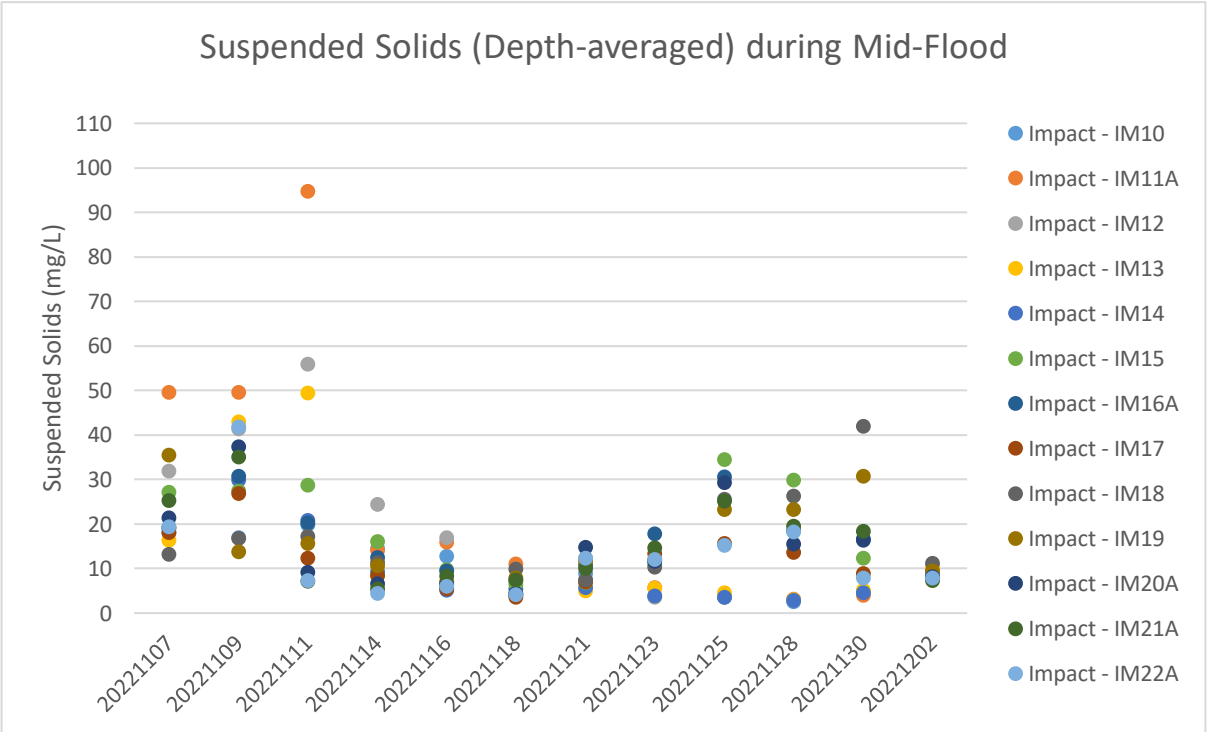

Figure F10p: Levels of Depth-averaged Suspended Solids (mg/L) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-flood tides between 7 November and 2 December 2022

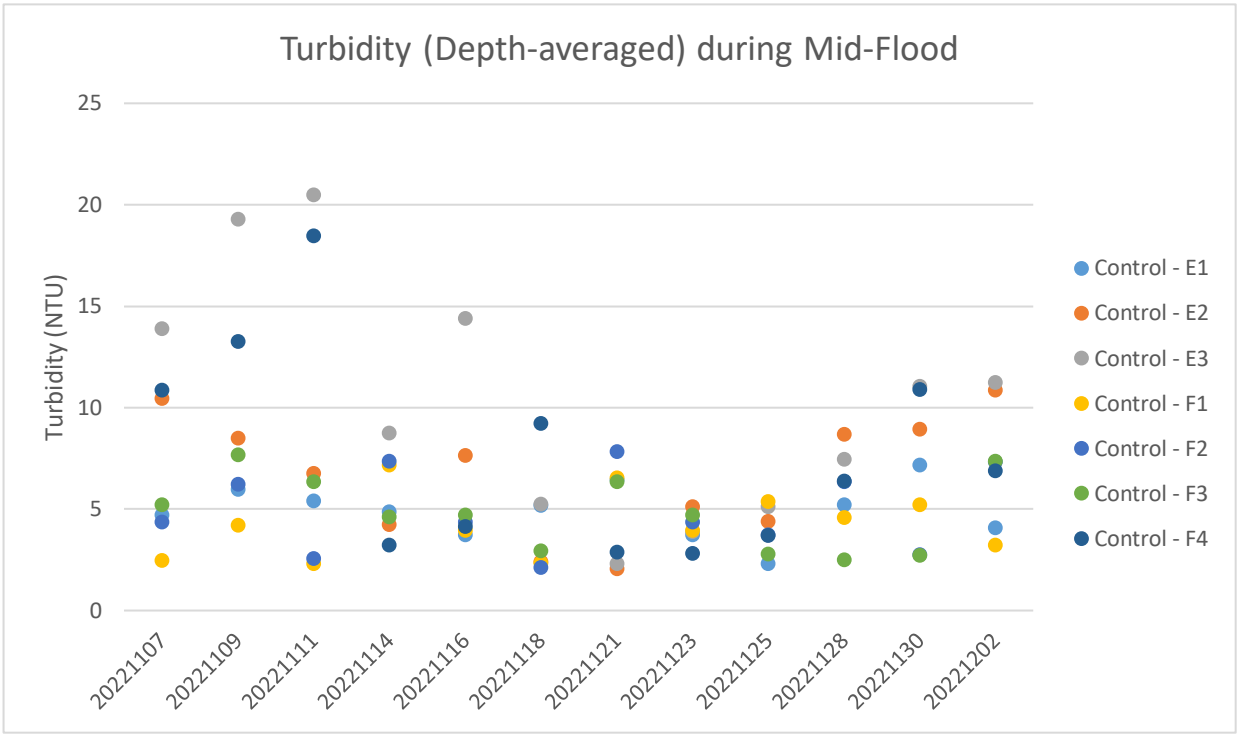

Figure F10q: Levels of Depth-averaged Turbidity (NTU) at control stations in the southern Hong Kong waters (E1-E3, F1-F4) during mid-flood tides between 7 November and 2 December 2022

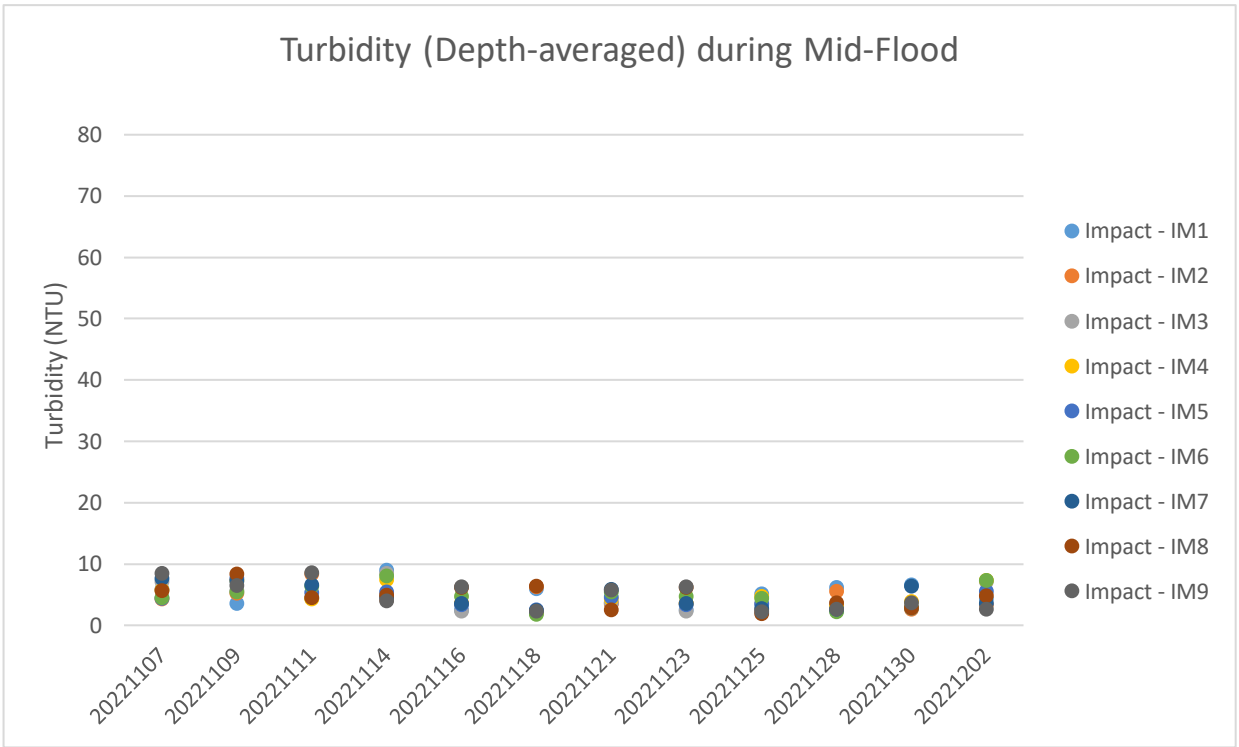

Figure F10r: Levels of Depth-averaged Turbidity (NTU) at impact stations in the southern Hong Kong waters (IM1-IM9) during mid-flood tides between 7 November and 2 December 2022

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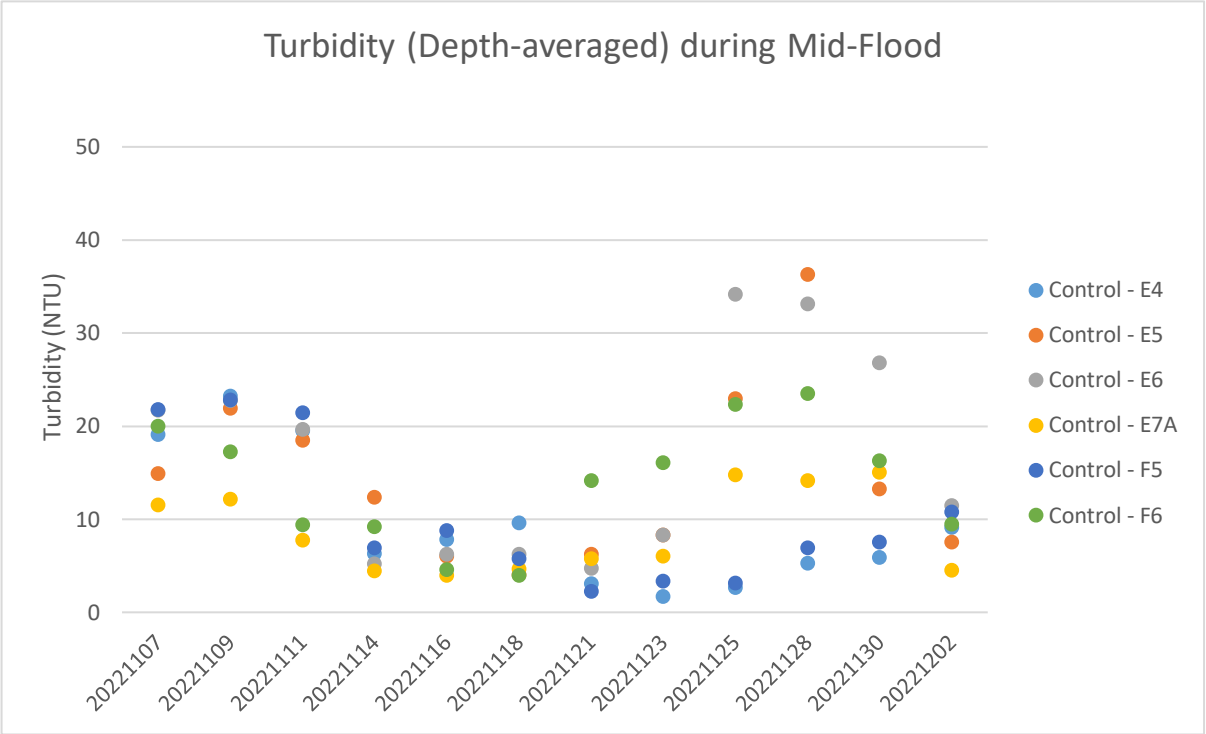

Figure F10s: Levels of Depth-averaged Turbidity (NTU) at control stations in the western Hong Kong waters (E4-E7A, F5-F6) during mid-flood tides between 7 November and 2 December 2022

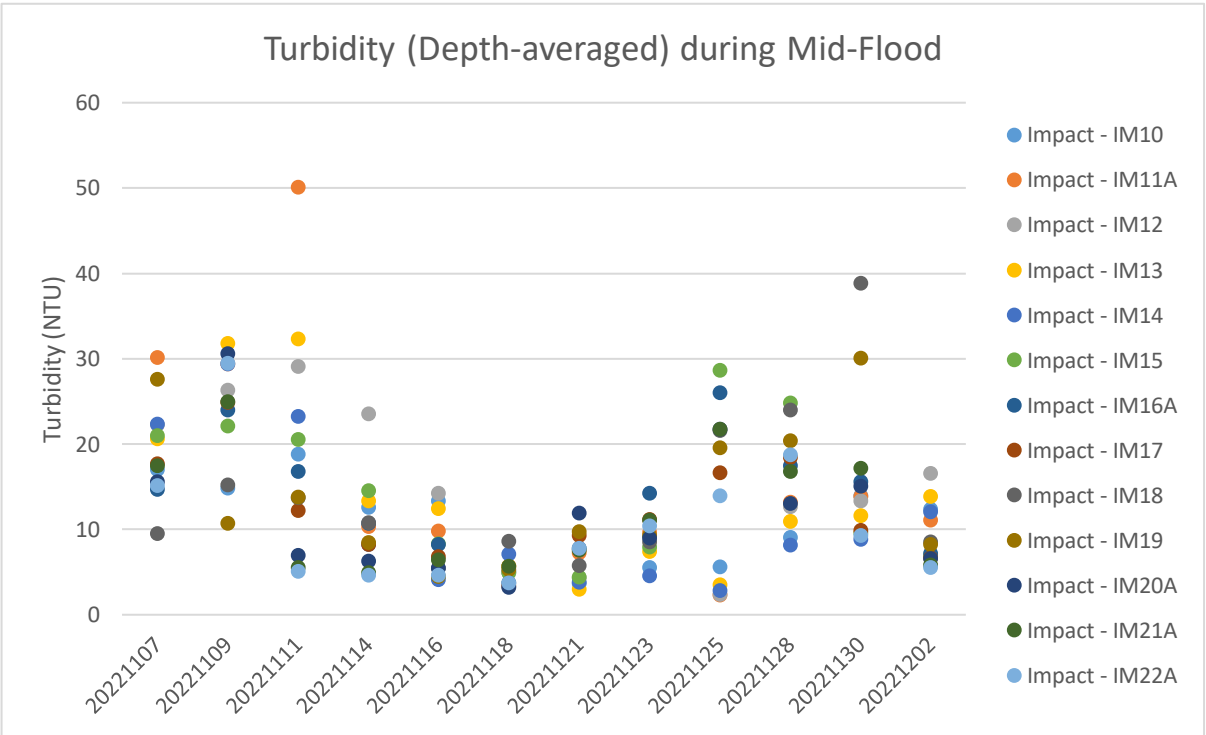

Figure F10t: Levels of Depth-averaged Turbidity (NTU) at impact stations in the western Hong Kong waters (IM10-IM22A) during mid-flood tides between 7 November and 2 December 2022