



水務署

Water Supplies Department



**Contract No. 13/WSD/17**

**Design, Build and Operate First Stage of Tseung Kwan O  
Desalination Plant**

**Quarterly EM&A Report No.13  
(Period from 1 March 2023 to 31 May 2023)**

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Date:	29 August 2023	29 August 2023



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Date: 25 August 2023

Attention: Mr Sam Hui/ Mr H L Lai

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Dear Sirs

Agreement No. CE 5/2019 (EP)  
Independent Environmental Checker for First Stage of  
Tseung Kwan O Desalination Plant– Investigation  
Verification of Quarterly EM&A Report No.13 (March – May 2023)

We refer to email of 22 August 2023 attaching Quarterly EM&A Report No.13 (March – May 2023) for the captioned project prepared by the ET.

We have no further comments and hereby verify the captioned report.

Should you have any queries regarding the above, please do not hesitate to contact the undersigned on 2618 2831.

Yours faithfully  
ANEWR CONSULTING LIMITED

Alex Chan  
Independent Environmental Checker

CYCA/lsmt

## REVISION HISTORY

<b>REV.</b>	<b>DESCRIPTION OF MODIFICATION</b>	<b>DATE</b>
1.	First Issue for Comments	22/08/2023
2.	Second Issue for Comments	29/08/2023

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## EXECUTIVE SUMMARY

### INTRODUCTION

- A1. The Project, Design, Build and Operate First Stage of Tseung Kwan O Desalination Plant (TKODP), is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is currently governed by a Further Environmental Permit (EP No. FEP – 01/503/2015/A) for the construction and operation of the Contract.
- A2. In accordance with the Environmental Monitoring and Audit (EM&A) Manual for the Contract, EM&A works for marine water quality, noise, waste management and ecology should be carried out by Environmental Team (ET), Acuity Sustainability Consulting Limited (ASCL), during the construction phase of the Contract.
- A3. This is the 13<sup>th</sup> Quarterly EM&A Report, prepared by ASCL, for the Contract summarizing the monitoring results and audit findings of the EM&A programme at and around Tseung Kwan O Area 137 (TKO 137) during the reporting period from 1 March 2023 to 31 May 2023.
- A4. The EM&A programme for this contract has covered environmental monitoring on construction noise level at selected NSRs and Contractor’s environmental performance auditing in the aspects of construction dust, construction noise, water quality, waste management, Landscape and Visual and Ecology.

### SUMMARY OF MAIN WORKS UNDERTAKEN & KEY MITIGATION MEASURES IMPLEMENTED

- A5. Key activities carried out in this reporting period for the Project included the followings:

Administration Building
<ul style="list-style-type: none"><li>• Installation of glass balustrade, metal cladding, building services, electrical switchboard, lift, cable laying</li><li>• carrying out interior finishes at 2/F, 3/F and 4/F</li><li>• Construction of staircase</li><li>• Construction of block wall in the pipe duct.</li></ul>
Chemical building
<ul style="list-style-type: none"><li>• Installation of handrail, permanent doors, building services, mechanical equipment, and cable laying</li><li>• Construction of staircase</li><li>• Underground utility construction work</li></ul>
Main Electrical & Central Chiller Plant Building
<ul style="list-style-type: none"><li>• Construction of fuel tank room</li><li>• Installation metal Doors, chillers, building services, electrical switchboard, cable laying</li></ul>
ActiDAFF
<ul style="list-style-type: none"><li>• Underground utility construction work</li><li>• Laying of roof floor screed and tiles</li></ul>

<ul style="list-style-type: none"> <li>• Construction of plinths for saturator tanks</li> <li>• Erection and dismantling of scaffolding, installation of mechanical equipment and piping, bubble test</li> <li>• Installation of underdrain</li> </ul>
<p>Product Water Storage Tank Building</p> <ul style="list-style-type: none"> <li>• Resin Injection Work &amp; Water Test for 1 Water Tanks</li> <li>• Installation of cat ladders in Water Tanks, and door</li> <li>• Installation of louvres, metal cladding, building services, cable laying, mechanical equipment, steel pipe</li> <li>• Underground utility construction</li> </ul>
<p>OSCG Building</p> <ul style="list-style-type: none"> <li>• Installation of Design for Manufacturing and Assembly Panel and metal door</li> <li>• Underground utility construction work</li> <li>• Installation of building services and mechanical equipment</li> </ul>
<p>Reverse Osmosis Building</p> <ul style="list-style-type: none"> <li>• Installation of Design for Manufacturing and Assembly Panels at East Sides</li> <li>• Installation of metal door, metal cladding, hand railings, Louvres &amp; Windows</li> <li>• Installation of building services, electrical switchboard, mechanical equipment, steel pipe, Glass Reinforced Plastics (GRP) pipe and cable laying</li> <li>• Underground utility construction work</li> </ul>
<p>Post Treatment Building</p> <ul style="list-style-type: none"> <li>• Installation of Louvres &amp; Windows, metal door and cat ladders</li> <li>• Installation of Design for Manufacturing and Assembly Panels</li> <li>• Installation of building services, mechanical equipment and GRP pipe</li> <li>• Underground utility construction work</li> </ul>
<p>Inspection corridor</p> <ul style="list-style-type: none"> <li>• Construction of bondek for segments 7</li> <li>• construction of staircase 8</li> </ul>
<p>CO<sub>2</sub> Tanks</p> <ul style="list-style-type: none"> <li>• Installation of pipes and building services</li> </ul> <p>Outfall Shaft</p> <ul style="list-style-type: none"> <li>• GRP Diffuser Pipe installation and rock material back fill</li> <li>• Dredging for diffuser pipe; Glass Reinforced Plastics Diffuser Pipe installation; rock material back fill</li> <li>• Shafts backfill rock and excavation and lateral support (ELS) removal</li> </ul> <p>Combined Shaft</p> <ul style="list-style-type: none"> <li>• Installation of building services, electrical equipment, switchboard, cable laying, mechanical equipment and pipes, stoplogs and band screens</li> <li>• Underground utility construction work</li> <li>• Staircases and internal finishing</li> <li>• Waterproofing works</li> </ul>

Pump room

- internal finishing and screeding

Other

- Excavation at slope toe and access erection, Soil anchor and grouting construction
- Foundation & structure construction at Elevated Walkway
- Watermain works at CLP 132 kV Substation
- Concrete Breaking, Structure Construction at Seawall
- Rock anchor installation; rock drilling, grouting

- A6. The major environmental impacts brought by the above construction works include:
- Construction dust and noise generation from marine construction works, excavation works, excavation works, construction works, rock cutting works and pipe piling driving works;
  - Waste generation from the construction activities
  - Impact on water quality from marine construction works and inland construction works
- A7. The key environmental mitigation measures implemented for the Project in this reporting period associated with the above construction works include:
- Dust suppression by regular wetting and water spraying for construction works;
  - Reduction of noise from equipment and machinery on-site and regularly inspection to machinery and plants/vehicles on-site to ensure proper functioning;
  - Sorting and storage of general refuse and construction waste; and
  - Deployment of temporary silt curtain in the area where marine construction works were conducted and deployment of water sedimentation tanks for treatment of wastewater at inland areas before discharge

**SUMMARY OF EXCEEDANCE & INVESTIGATION & FOLLOW-UP**

- A8. No noise monitoring was conducted during the reporting period since there are no project-related construction activities undertaken within a radius of 300m from the monitoring locations. No exceedance of the Action Level was recorded during the reporting period.
- A9. The EM&A works for water quality were conducted during the reporting period in accordance with the EM&A Manual.
- A10. Water quality monitoring was conducted as scheduled in the reporting period. One hundred and twenty-nine (129) action level exceedances and one hundred and six (106) limit level exceedances for suspended solids (SS) of impact water quality monitoring were recorded in the reporting period. All action and limit level exceedances were concluded non-project related.
- A11. In this reporting period, 146 times of landfill gas monitoring were recorded at Wan Po Road (Ch0+390 – Ch0+780). No action and limit level exceedance for methane, oxygen and carbon dioxide was recorded.

- A12. Weekly site inspections of the construction works were also carried out by ET to audit the mitigation measures implementation status. Thirteen (13) times of weekly Joint site inspections were carried out by ET and IEC.
- A13. A summary of the EM&A activities in this reporting period is listed in **Table I** and summary of the environmental exceedance of the reporting period is tabulated in **Table II**.

**Table I Summary Table for EM&A Activities in the Reporting Period**

EM&A Activities	Mar 2023	Apr 2023	May 2023
Noise Monitoring	N/A	N/A	N/A
Water Quality Monitoring	2, 5, 7, 9, 11, 14, 16, 18, 21, 23, 25, 28 and 30 March 2023	1, 4, 6, 8, 11, 13, 15, 18, 20, 22, 25, 27 and 29 April 2023	2, 4, 6, 9, 11, 13, 16, 18, 20, 23, 25, 27 and 30 May 2023
Landfill Gas monitoring	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30 and 31 March 2023	3, 4, 6, 11, 23, 13, 14, 15, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29 April 2023	2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30 and 31 May 2023
Environmental Site Inspection	7, 14, 22 and 31 March 2023	4, 11, 18 and 24 April 2023	2, 9, 16, 23 and 30 May 2023

**Table II Summary Table for Exceedance in the Reporting Period**

Environmental Monitoring	Parameter	No. of non-Project related exceedance		Total No. of non-Project related exceedance	No. of Project related exceedance		Total No. of Project related exceedance
		AL	LL		AL	LL	
Noise	L <sub>eq</sub> (30min)	N/A	N/A	N/A	N/A	N/A	N/A
Water	DO	0	0	0	0	0	0
	Turbidity	0	0	0	0	0	0
	SS	129	106	235	0	0	0
	pH	0	0	0	0	0	0
Landfill Gas	Salinity	0	0	0	0	0	0
	O <sub>2</sub>	0	0	0	0	0	0
	CH <sub>4</sub>	0	0	0	0	0	0
	CO <sub>2</sub>	0	0	0	0	0	0

**COMPLAINT HANDLING AND PROSECUTION**

- A14. No environmental complaint, notifications of summons or prosecution was received during the reporting period.

**REPORTING CHANGE**

- A15. There was no change to be reported that may affect the on-going EM&A programme.

## 1. BASIC PROJECT INFORMATION

### 1.1. BACKGROUND

The Acciona Agua, S.A. Trading, Jardine Engineering Corporation Limited and China State Construction Engineering (Hong Kong) Limited and as AJC Joint Venture (AJCJV) is contracted to carry out the Design, Build and Operate First Stage of Tseung Kwan O Desalination Plant (DPTKO) under Contract No. 13/WSD/17 (the Contract).

Acuity Sustainability Consulting Limited (ASCL) is commissioned by AJCJV to undertake the Environmental Team (ET) services as required and/or implied, both explicitly and implicitly, in the Environmental Permit (EP), Environmental Impact Assessment Report (EIA Report) (Register No. AEIAR-192/2015) and Environmental Monitoring and Audit Manual (EM&A Manual) for the Contract; and to carry out the Environmental Monitoring and Audit (EM&A) programme in fulfillment of the EIA Report’s EM&A requirements and Contract No. 13/WSD/17 Specification requirements.

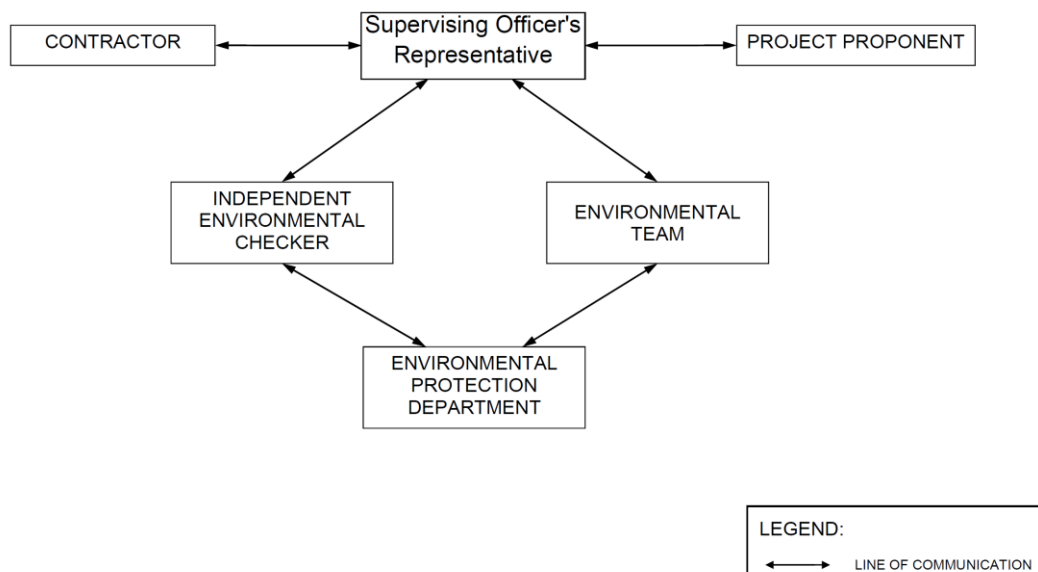
Pursuant to the Environmental Impact Assessment Ordinance (EIAO), the Director of Environmental Protection granted the Environmental Permit (No. EP-01/503/2015) and Variation of Environmental Permit (No. EP-01/503/2015/A) to Water Supplies Department (WSD); and granted the Further Environmental Permit (No. FEP-01/503/2015/A) to AJCJV for the Contract.

### 1.2. THE REPORTING SCOPE

This is the 13<sup>th</sup> Quarterly EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 March 2023 to 31 May 2023.

### 1.3. PROJECT ORGANIZATION

The Project Organization structure for Construction Phase is presented in **Figure 1.1**.



**Figure 1.1 Project Organization Chart**

Contact details of the key personnel are presented in **Table 1.1** below:

**Table 1.1 Contact Details of Key Personnel**

Party	Position	Name	Telephone no.
Project Proponent	SE/CM2	Milton Law	2634-3573
Supervising Officer (Binnies Hong Kong Limited)	Project Manager	Christina Ko	2608-7302
	Chief Resident Engineer	Roger Wu	6343-1002
The Jardine Engineering Corporation, Limited, China State Construction Engineering (Hong Kong) Limited and Acciona Agua, S.A. Trading	Project Manager	Stephen Yeung	2807-4665
	Environmental Monitoring Manager	Brian Kam	9456-9541
Acuity Sustainability Consulting Limited	Environmental Team Leader	Jacky Leung	2698-6833
ANewR Consulting Limited	Independent Environmental Checker (IEC)	Louis Kwan	2618-2831

#### 1.4. SUMMARY OF CONSTRUCTION WORKS

Details of the major construction activities undertaken in this reporting period are shown as below. The construction programme is presented in **Appendix A**.

<p>Administration Building</p> <ul style="list-style-type: none"> <li>• Installation of glass balustrade, metal cladding, building services, electrical switchboard, lift, cable laying</li> <li>• carrying out interior finishes at 2/F, 3/F, and 4/F</li> <li>• Construction of staircase</li> <li>• Construction of block wall in the pipe duct.</li> </ul>
<p>Chemical building</p> <ul style="list-style-type: none"> <li>• Installation of handrail, permanent doors, building services, mechanical equipment, and cable laying</li> <li>• Construction of staircase</li> <li>• Underground utility construction work</li> </ul>
<p>Main Electrical &amp; Central Chiller Plant Building</p> <ul style="list-style-type: none"> <li>• Construction of fuel tank room</li> <li>• Installation metal Doors, chillers, building services, electrical switchboard, cable laying</li> </ul>

<p>ActiDAFF</p> <ul style="list-style-type: none"> <li>• Underground utility construction work</li> <li>• Laying of roof floor screed and tiles</li> <li>• Construction of plinths for saturator tanks</li> <li>• Erection and dismantling of scaffolding, installation of mechanical equipment and piping, bubble test</li> <li>• Installation of underdrain</li> </ul>
<p>Product Water Storage Tank Building</p> <ul style="list-style-type: none"> <li>• Resin Injection Work &amp; Water Test for 1 Water Tanks</li> <li>• Installation of cat ladders in Water Tanks, and door</li> <li>• Installation of louvres, metal cladding, building services, cable laying, mechanical equipment, steel pipe</li> <li>• Underground utility construction</li> </ul>
<p>OSCG Building</p> <ul style="list-style-type: none"> <li>• Installation of Design for Manufacturing and Assembly Panel and metal door</li> <li>• Underground utility construction work</li> <li>• Installation of building services and mechanical equipment</li> </ul>
<p>Reverse Osmosis Building</p> <ul style="list-style-type: none"> <li>• Installation of Design for Manufacturing and Assembly Panels at East Sides</li> <li>• Installation of metal door, metal cladding, hand railings, Louvres &amp; Windows</li> <li>• Installation of building services, electrical switchboard, mechanical equipment, steel pipe, Glass Reinforced Plastics (GRP) pipe and cable laying</li> <li>• Underground utility construction work</li> </ul>
<p>Post Treatment Building</p> <ul style="list-style-type: none"> <li>• Installation of Louvres &amp; Windows, metal door and cat ladders</li> <li>• Installation of Design for Manufacturing and Assembly Panels</li> <li>• Installation of building services, mechanical equipment and GRP pipe</li> <li>• Underground utility construction work</li> </ul>
<p>Inspection corridor</p> <ul style="list-style-type: none"> <li>• Construction of bondek for segments 7</li> <li>• construction of staircase 8</li> </ul>
<p>CO<sub>2</sub> Tanks</p> <ul style="list-style-type: none"> <li>• Installation of pipes and building services</li> </ul> <p>Outfall Shaft</p> <ul style="list-style-type: none"> <li>• GRP Diffuser Pipe installation and rock material back fill</li> <li>• Dredging for diffuser pipe; Glass Reinforced Plastics Diffuser Pipe installation; rock material back fill</li> <li>• Shafts backfill rock and excavation and lateral support (ELS) removal</li> </ul> <p>Combined Shaft</p> <ul style="list-style-type: none"> <li>• Installation of building services, electrical equipment, switchboard, cable laying, mechanical equipment and pipes, stoplogs and band screens</li> </ul>



<ul style="list-style-type: none"> <li>Underground utility construction work</li> <li>Staircases and internal finishing</li> <li>Waterproofing works</li> </ul>
Pump room
<ul style="list-style-type: none"> <li>internal finishing and screeding</li> </ul>
Other
<ul style="list-style-type: none"> <li>Excavation at slope toe and access erection, Soil anchor and grouting construction</li> <li>Foundation &amp; structure construction at Elevated Walkway</li> <li>Watermain works at CLP 132 kV Substation</li> <li>Concrete Breaking, Structure Construction at Seawall</li> <li>Rock anchor installation; rock drilling, grouting</li> </ul>

### 1.5. SUMMARY OF ENVIRONMENTAL STATUS

A summary of the valid permits, licences, and /or notifications on environmental protection for this Project is presented in **Table 1.2**.

**Table 1.2 Summary of the Status of Valid Environmental Licence, Notification, Permit and Documentations**

Permit/ Licences	Valid Period		Status	Remark
	From	To		
<b>Environmental Permit</b>				
EP – 503/2015/A	Throughout the Contract		Valid	-
FEP – 01/503/2015/A	Throughout the Contract		Valid	-
<b>Notification of Construction Works under the Air Pollution Control (Construction Dust) Regulation (Form NA)</b>				
451539	Throughout the Contract		Valid	-
<b>Billing Account for Disposal of Construction Waste</b>				
7036276	Throughout the Contract		Valid	-
<b>Chemical Waste Producer Registration</b>				
5213-839-A2987-01	Throughout the Contract		Valid	-
<b>Wastewater Discharge Licence (Land and Marine works)</b>				
WT00035775-2020	23/08/2021	31/07/2025	Valid	-
<b>Marine Dumping Permits</b>				
EP/MD/23-053	07/12/2023	30/03/2023	Expired in the reporting period	-



Permit/ Licences	Valid Period		Status	Remark
	From	To		
EP/MD/23-122	31/03/2023	30/06/2023	Valid	
<b>Vessel CHITs for fill disposal</b>				
7039300	14/02/2023	08/05/2023	Expired in the reporting period	-
<b>Construction Noise Permit</b>				
GW-RE1338-22	22/12/2022	21/06/2023	Valid	-

The status for all environmental aspects is presented in **Table 1.3**.

**Table 1.3 Summary of Status for Key Environmental Aspects under the EM&A Manual**

Parameters	Status
<b>Water Quality</b>	
Baseline Monitoring under EM&A Manual	The baseline water quality monitoring was conducted between 12 May 2020 and 6 June 2020
Impact Monitoring	On-going
<b>Noise</b>	
Baseline Monitoring	The baseline noise monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4
Impact Monitoring	On-going
<b>Waste Management</b>	
Mitigation Measures in Waste Management Plan	On-going
<b>Landfill Gas</b>	
Regular Monitoring when Construction Works are within the 250m Consultation Zone	In this reporting period, 146 times of landfill gas monitoring were recorded at Wan Po Road (Ch0+390 – Ch0+780). No exceedance of action or limit level for methane, oxygen and carbon dioxide was observed
<b>Environmental Audit</b>	
Site Inspection covering Measures of Air Quality, Noise Impact, Water Quality, Waste, Ecological Quality, Fisheries, Landscape and Visual	On-going

Other than the EM&A work by ET, environmental briefings, trainings and regular environmental management meetings were conducted, in order to enhance environmental awareness and closely monitor the environmental performance of the contractors.

The EM&A programme has been implemented in accordance with the recommendations presented in the approved EIA Report and the EM&A Manual. A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix C**.

## 2. NOISE

### 2.1. MONITORING REQUIREMENTS

To ensure no adverse noise impact, construction noise monitoring is recommended to be carried out within 300m radius from the nearby noise sensitive receivers (NSRs), during construction phase. The NSRs selected as monitoring station are (i) NSR4 – Creative Secondary School, (ii) NSR24 – PLK Laws Foundation College, and (iii) NSR31 – School of Continuing and Professional Studies – CUHK respectively.

No impact construction noise monitoring was conducted in the reporting period due to the overly distant monitoring station from the works location, where they were farther than 1 km from the closet monitoring station NSR4 to the works location.

### 2.2. MONITORING PARAMETERS, FREQUENCY AND DURATION

Construction noise level would be measured in terms of the A-weighted equivalent continuous sound pressure level (LAeq). Leq<sub>30min</sub> was used as the monitoring parameter for the time period between 0700 and 1900 on normal weekdays. **Table 2.1** summarizes the monitoring parameters, frequency and duration of the impact noise monitoring.

**Table 2.1 Noise Monitoring Parameters, Time, Frequency and Duration**

Time	Duration	Interval	Parameters
Daytime: 0700-1900	Day time: 0700-1900 (during normal weekdays)	Continuously in Leq <sub>5min</sub> /Leq <sub>30min</sub> (average of 6 consecutive Leq <sub>5min</sub> )	Leq <sub>30min</sub> L <sub>10 30min</sub> & L <sub>90 30min</sub>

### 2.3. MONITORING LOCATIONS

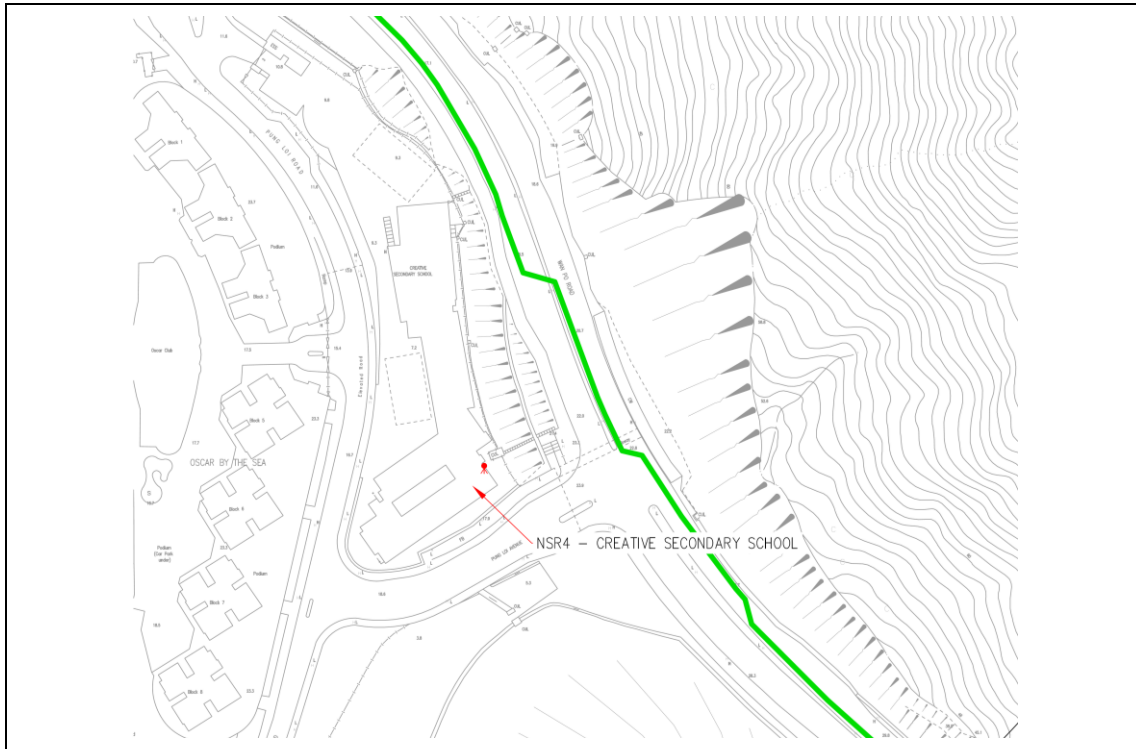
The monitoring locations should normally be made at a point 1m from the exterior of the NSRs building façade and be at a position 1.2m above the ground. A correction of +3dB(A) should be made to the free-field measurements.

According to the environmental findings detailed in the EIA report and Baseline Monitoring Report, the designated locations for the construction noise monitoring are listed in **Table 2.2** below.

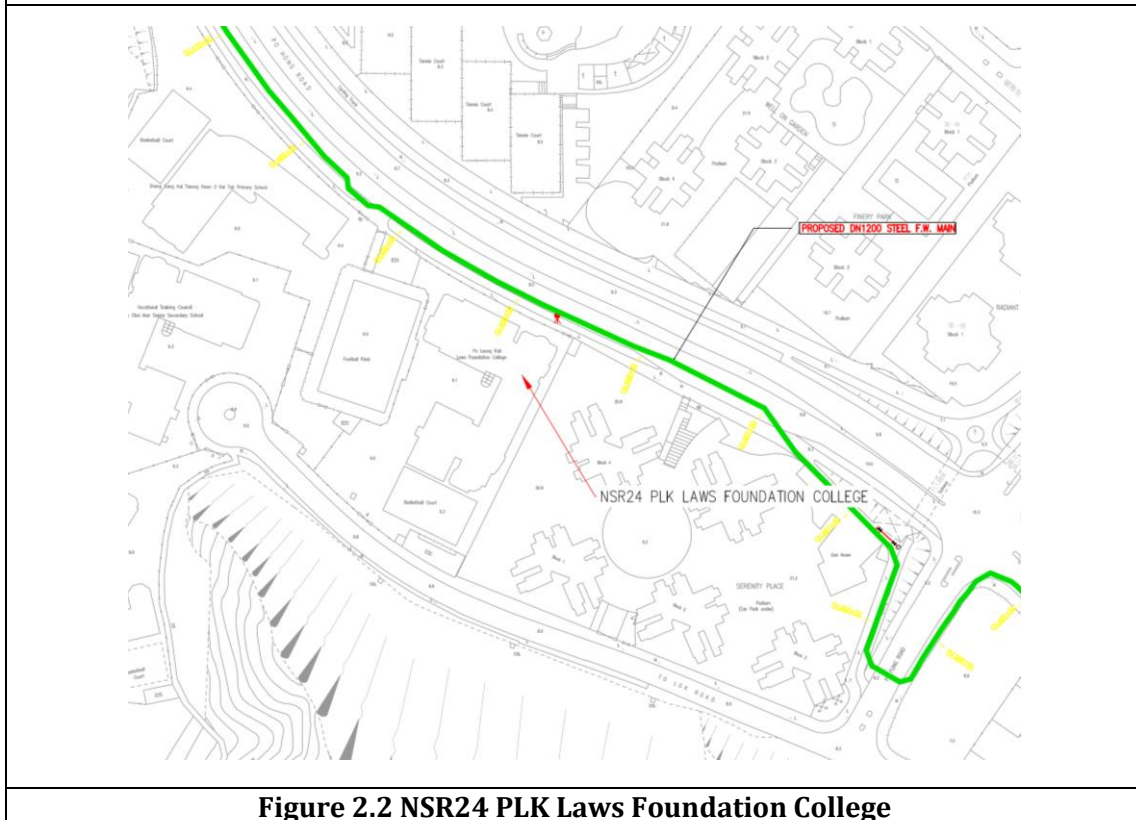
**Table 2.2 Noise Sensitive Receivers**

NSR ID	Noise Sensitive Receivers	Monitoring Location	Position
NSR 4	Creative Secondary School	Roof Floor	1 m from facade
NSR 24	PLK Laws Foundation College	Pedestrian Road on Ground Floor	Free-field
NSR 31	School of Continuing and Professional Studies - CUHK	Roof Floor	1 m from facade

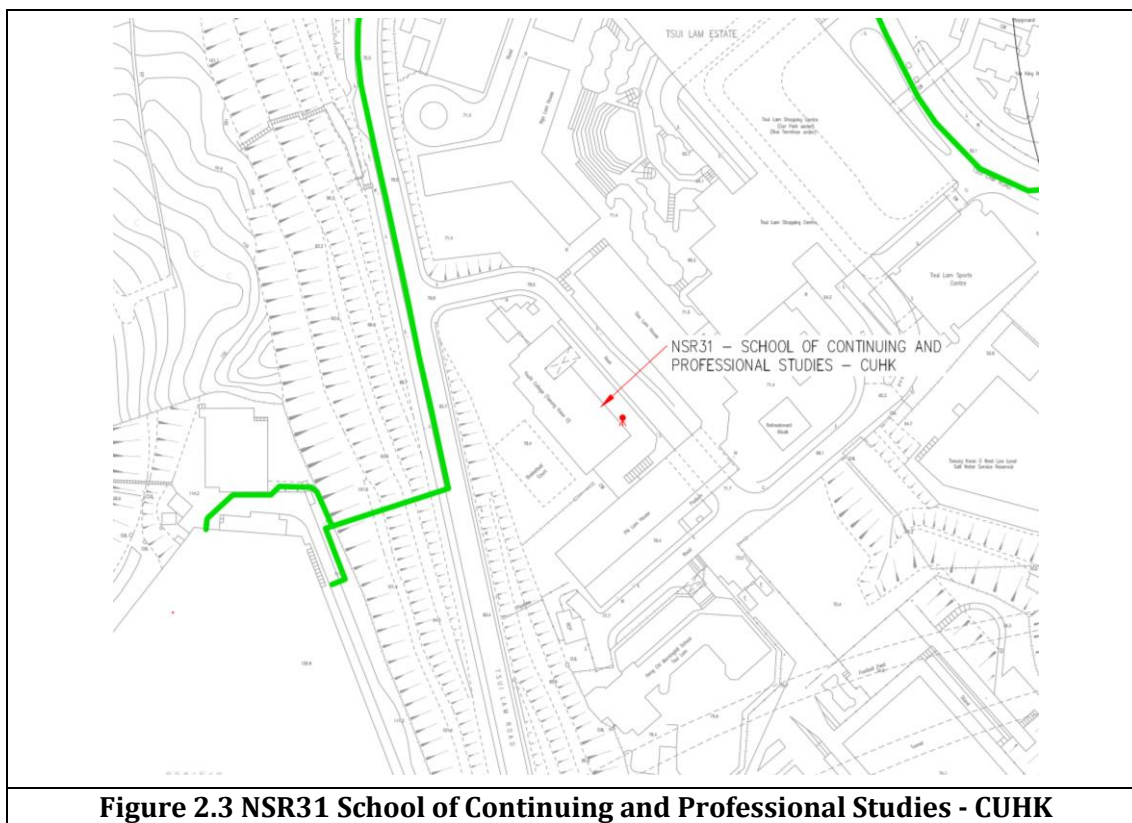
The monitoring locations should normally be made at a point 1m from the exterior of the NSRs building façade and be at a position 1.2m above the ground. A correction of +3dB(A) should be made to the free-field measurements. Three noise monitoring locations for impact monitoring at the nearby sensitive receivers are shown in **Figure 2.1-2.3**.



**Figure 2.1 NSR4 Creative Secondary School**



**Figure 2.2 NSR24 PLK Laws Foundation College**



**Figure 2.3 NSR31 School of Continuing and Professional Studies - CUHK**

#### 2.4. ACTION AND LIMIT LEVELS

The Action/Limit Levels are in line with the criteria of Practice Note for Professional Persons (ProPECC PN 2/93) “Noise from Construction Activities – Non-statutory Controls” and Technical Memorandum on Environmental Impact Assessment Process issued by HKSAR Environmental Protection Department [“EPD”] under the Environmental Impact Assessment Ordinance, Cap 499, S.16 are presented in **Table 2.3**.

**Table 2.3 Action and Limit Levels for Construction Noise Monitoring per EM&A Manual**

Time Period	Action Level	Limit Level (dB(A))
0700-1900 on normal weekdays	When one documented complaint is received from any one of the noise sensitive receivers	<ul style="list-style-type: none"> <li>• 70 dB(A) for school and</li> <li>• 65 dB(A) during examination period</li> </ul>

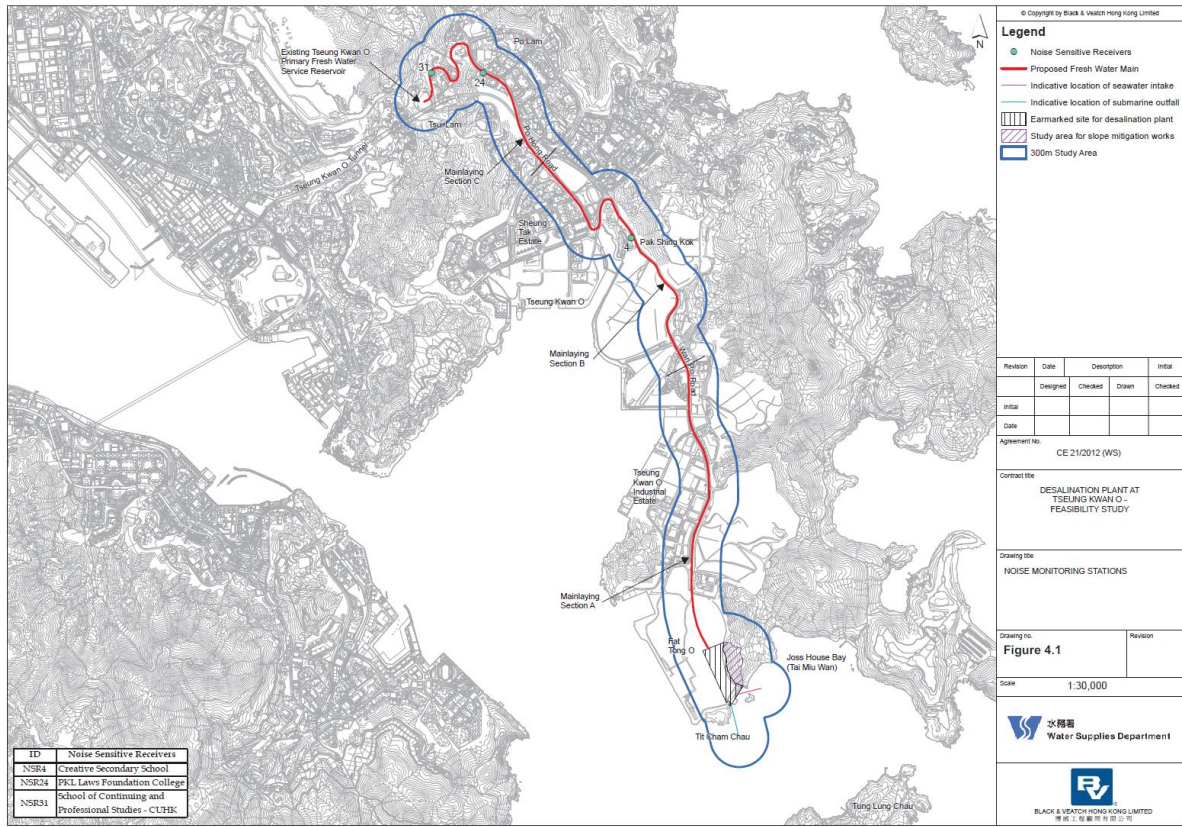
Notes: Limits specified in the GW-TM and IND-TM for construction and operation noise, respectively.

If exceedances were found during noise monitoring, the actions in accordance with the Event and Action Plan shall be carried out according to **Appendix E**.



## 2.5. MONITORING RESULTS AND OBSERVATIONS

Referring to EM&A manual Section 4.1.2, the impact noise monitoring should be carried out when there are project-related construction activities undertaken within a radius of 300m from the monitoring stations. No noise monitoring station was located within a radius of 300m of the Project site as shown in **Figure 2.4**, no impact monitoring for noise impact was conducted in the reporting period.



**Figure 2.4 Site Layout Plan with Noise Sensitive Receivers and Desalination Plant**

### 3. WATER QUALITY

In accordance with the recommendations of the EIA, water quality monitoring is required during dredging for the submarine pipelines and, during operation phase. In addition, baseline water quality monitoring was conducted prior to the commencement of marine construction activities.

The following Section provides details of the water quality monitoring to be undertaken by the Environmental Team (ET) to verify the distance of sediment and brine plume dispersion and to identify whether the potential exists for any indirect impacts to occur to ecological sensitive receivers. The water quality monitoring programme was carried out to allow any deteriorating water quality to be readily detected and timely action taken to rectify the situation.

Water quality monitoring for the Project can be divided into the following stages:

- Dredging activities during construction phase;
- Discharge of effluent from main disinfection during construction phase;
- Operation phase – first year upon commissioning; and,
- Continuous monitoring of effluent quality.

#### 3.1. WATER QUALITY PARAMETERS

The parameters that have been selected for measurement in situ and in the laboratory are those that were either determined in the EIA to be those with the most potential to be affected by the construction works or are a standard check on water quality conditions. Parameters measured in the impact monitoring are listed in **Table 3.1**

**Table 3.1 Parameters measured in the impact marine water quality monitoring**

Parameters	Unit	Abbreviation
<b>In-situ measurements</b>		
Dissolved oxygen	mg/L	DO
Temperature	°C	-
pH	-	-
Turbidity	NTU	-
Salinity	‰	-
<b>Laboratory measurements</b>		
Suspended Solids	mg/L	SS

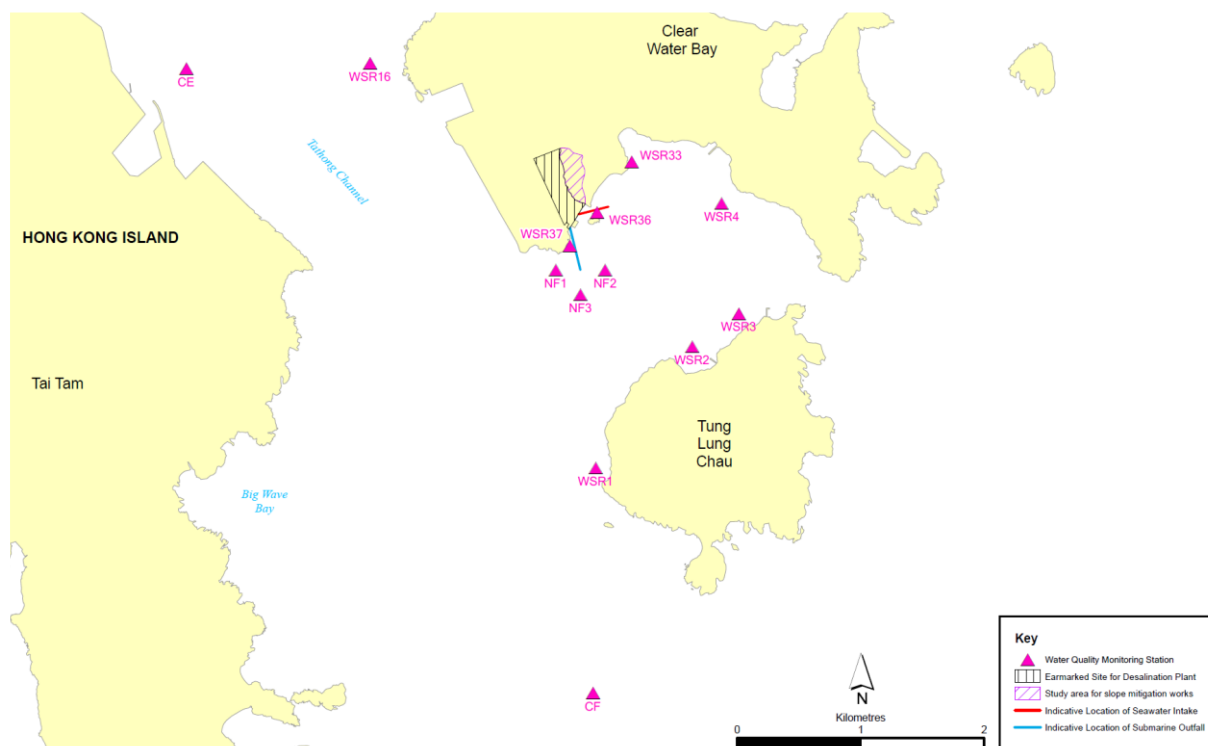
In addition to the water quality parameters, other relevant data were measured and recorded in Water Quality Monitoring Logs, including the location of the sampling stations, water depth, time, weather conditions, sea conditions, tidal stage, current direction and velocity, special phenomena and work activities undertaken around the monitoring and works area that may influence the monitoring results.

### 3.2. MONITORING LOCATIONS

The impact water quality monitoring locations are detailed in **Table 3.2** and shown in **Figure 3.1** below.

**Table 3.2 Location of Impact Water Quality Monitoring Station**

Station	Easting	Northing	Description
CE	843550	815243	Upstream control station at ebb tide
CF	846843	810193	Upstream control station at flood tide
WSR1	846864	812014	Ecological sensitive receiver at Tung Lung Chau
WSR2	847645	812993	Fisheries sensitive receiver at Tung Lung Chau
WSR3	848023	813262	Ecological sensitive receiver at Tung Lung Chau
WSR4	847886	814154	Ecological sensitive receiver at Tai Miu Wan
WSR16	845039	815287	Ecological sensitive receiver at Fat Tong Chau
WSR33	847159	814488	Ecological sensitive receiver at Tai Miu Wan
WSR36	846878	814081	Ecological sensitive receiver at Kwun Tsai
WSR37	846655	813810	Ecological sensitive receiver at Tit Cham Chau
NF1	846542	813614	Edge of mixing zone, ~ 200m west of outfall diffuser
NF2	846942	813614	Edge of mixing zone, ~ 200m east of outfall diffuser
NF3	846742	813414	Edge of mixing zone, ~ 200m south of outfall diffuser



**Figure 3.1 Impact Water Quality Monitoring Locations under EM&A Manual**

### 3.3. MONITORING EQUIPMENT, METHODOLOGY AND QA/QC PROCEDURES

The monitoring methodology, equipment used, and QA/QC procedures could be referred to Section 3.1.2 -3.1.4, 3.1.6-3.1.7 and 3.2 of the Monthly EM&A Report.

### 3.4. ACTION AND LIMIT LEVELS

The Action and Limit Levels have been set based on the derivation criteria specified in the EM&A Manual and based on the baseline water quality monitoring data and the derivation criteria, the Action/Limit Levels have been derived and are presented in **Table 3.3**.

**Table 3.3 Derived Action and Limit Levels for Water Quality**

Parameters	Action	Limit
<b>Construction Phase Impact Monitoring</b>		
DO in mg/L	<u>Surface and Middle</u> 7.30 mg L <sup>-1</sup> <u>Bottom</u> 7.31 mg L <sup>-1</sup> <u>Tung Lung Chau Fish Culture Zone</u> 5.1 mgL <sup>-1</sup> or level at control station (Whichever the lower)	<u>Surface and Middle</u> 4 mg L <sup>-1</sup> <u>Bottom</u> 2 mg L <sup>-1</sup> <u>Tung Lung Chau Fish Culture Zone</u> 5.0 mgL <sup>-1</sup> or level at control station (Whichever the lower)
SS in mg/L (Depth-averaged)	5.00 mg L <sup>-1</sup> or 20% exceedance of value at any impact station compared with corresponding data from control station	6.00 mg L <sup>-1</sup> or 30% exceedance of value at any impact station compared with corresponding data from control station
Turbidity in NTU (Depth-averaged)	2.41 NTU or 20% exceedance of value at any impact station compared with corresponding data from control station	2.84 NTU or 30% exceedance of value at any impact station compared with corresponding data from control station

Notes:

- i. "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
- ii. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- iii. For Turbidity, SS, iron and Salinity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.



### 3.5. MONITORING RESULTS AND OBSERVATIONS

General water quality monitoring at the ten monitoring stations (CE, CF, WSR1, WSR2, WSR3, WSR4, WSR16, WSR33, WSR36 and WSR37) were conducted as scheduled in the reporting month.

One hundred and twenty-nine (129) of the general water quality monitoring results of suspended solids (SS) obtained had exceeded the Action Level. One hundred and six (106) of the general water quality monitoring results of SS obtained during the reporting quarter had exceeded the Limit Level.

Investigation on the reason of exceedance has been carried out, where the exceedances of SS were concluded to be unrelated to the project. Details of the instigation could be referred to Monthly EM&A Report **Appendix O**.

**Table 3.4 Summary of Regular Impact Water Quality Monitoring Results (Mid-Flood)**

Location		Parameter																					
		Salinity (ppt)			Dissolved Oxygen (mg/L)						pH			Turbidity (NTU)			Suspended Solids (mg/L)			Temp. (°C)			
					Surface & Middle			Bottom															
Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May
CE	Avg.	32.8	32.7	32.7	8.7	8.9	8.9	8.7	8.9	8.9	8.2	8.2	8.3	2.5	2.6	2.5	3.5	2.9	2.7	21.2	22.9	25.7	
	Min.	30.7	31.4	30.9	8.2	8.2	8.4	8.2	8.2	8.4	8.1	8.1	8.2	1.9	2.2	2.2	2.5	2.5	2.5	19.7	20.8	21.5	
	Max.	34.2	33.8	33.5	9.5	9.5	9.7	9.4	9.6	9.7	8.4	8.4	8.4	3.0	3.0	2.9	22.0	5.0	5.0	22.6	25.1	27.5	
CF	Avg.	32.6	32.5	32.8	8.7	8.8	8.9	8.7	8.8	8.9	8.3	8.2	8.3	2.9	3.0	2.9	4.4	2.9	2.9	21.2	23.1	26.0	
	Min.	30.6	31.5	31.7	8.2	8.2	8.4	8.2	8.2	8.5	8.1	8.1	8.2	2.3	2.5	2.5	2.5	2.5	2.5	20.0	20.6	25.1	
	Max.	34.3	33.2	33.8	9.6	9.5	9.6	9.6	9.5	9.6	8.5	8.4	8.4	3.4	3.6	3.3	22.0	9.0	7.0	22.4	25.0	27.2	
WSR1	Avg.	32.6	32.5	32.6	8.8	9.0	8.7	8.8	9.0	8.7	8.2	8.2	8.3	2.0	2.1	2.0	4.4	3.1	2.6	21.2	23.0	25.9	
	Min.	31.2	31.8	31.4	8.1	8.3	8.3	8.1	8.3	8.2	8.2	8.1	8.2	1.7	1.6	1.6	2.5	2.5	2.5	19.8	21.3	24.9	
	Max.	33.8	33.8	33.7	9.5	9.8	9.2	9.5	9.7	9.2	8.4	8.4	8.4	2.4	2.4	2.4	22.0	6.0	5.0	22.6	25.4	27.0	
WSR2	Avg.	32.5	32.7	32.6	9.1	8.9	8.9	9.1	8.9	8.9	8.2	8.2	8.3	2.0	2.1	2.1	3.7	2.8	2.7	21.1	23.0	25.9	
	Min.	31.3	31.5	31.8	8.3	8.4	8.2	8.3	8.3	8.2	8.1	8.2	8.1	1.7	1.6	1.7	2.5	2.5	2.5	20.1	21.0	24.7	
	Max.	33.7	33.9	33.3	9.7	9.6	9.5	9.8	9.5	9.5	8.4	8.4	8.4	2.3	2.5	2.5	11.0	6.0	4.0	22.5	25.4	27.2	
WSR3	Avg.	32.6	32.7	32.8	8.8	8.8	9.1	8.8	8.8	9.1	8.2	8.3	8.3	2.1	2.1	2.1	3.5	2.7	2.8	21.2	23.1	26.0	
	Min.	30.7	31.5	31.8	8.3	8.2	8.7	8.3	8.2	8.6	8.1	8.1	8.1	1.7	1.7	1.7	2.5	2.5	2.5	20.1	20.5	24.6	
	Max.	34.1	33.6	33.7	9.5	9.3	9.4	9.5	9.3	9.5	8.4	8.4	8.4	2.4	2.4	2.5	14.0	6.0	6.0	22.5	25.5	27.8	
WSR4	Avg.	32.7	32.6	32.6	8.9	8.9	8.8	8.9	8.9	8.8	8.3	8.2	8.3	2.0	2.1	2.1	3.7	2.7	2.9	21.1	23.0	26.0	
	Min.	31.2	31.2	31.9	8.2	8.3	8.3	8.3	8.3	8.4	8.1	8.1	8.1	1.6	1.7	1.6	2.5	2.5	2.5	20.0	21.0	24.7	
	Max.	33.9	33.7	33.7	9.4	9.8	9.3	9.3	9.7	9.3	8.4	8.4	8.4	2.5	2.3	2.4	10.0	5.0	6.0	22.4	25.0	27.3	
WSR16	Avg.	32.7	32.5	32.7	8.9	8.8	8.9	8.9	8.7	8.9	8.3	8.3	8.2	2.1	2.1	2.1	4.3	3.3	2.7	21.0	23.0	25.9	
	Min.	30.9	31.6	30.9	8.1	8.2	8.2	8.1	8.2	8.3	8.1	8.1	8.1	1.8	1.7	1.8	2.5	2.5	2.5	20.0	21.2	24.6	
	Max.	34.2	33.6	33.7	9.5	9.5	9.4	9.5	9.4	9.5	8.4	8.4	8.4	2.4	2.5	2.6	22.0	19.0	4.0	22.0	24.7	27.4	
WSR33	Avg.	32.7	32.7	32.8	8.8	8.7	8.7	8.8	8.7	8.7	8.3	8.2	8.3	2.0	2.0	2.0	3.5	3.7	2.9	21.2	23.0	26.1	
	Min.	31.3	31.3	31.1	8.0	8.2	8.2	8.0	8.2	8.2	8.2	8.1	8.1	1.7	1.6	1.7	2.5	2.5	2.5	20.1	20.9	24.8	
	Max.	34.1	34.0	33.7	9.4	9.4	9.6	9.5	9.4	9.6	8.5	8.4	8.4	2.4	2.5	2.5	10.0	29.0	6.0	22.7	25.2	27.4	
WSR36	Avg.	32.6	32.5	32.6	9.1	8.8	8.9	9.1	8.8	8.9	8.2	8.2	8.2	2.0	2.1	2.1	3.0	2.9	2.7	21.1	23.0	26.1	
	Min.	30.3	31.3	31.4	8.5	8.2	8.3	8.5	8.3	8.3	8.1	8.1	8.1	1.7	1.7	1.7	2.5	2.5	2.5	20.0	21.0	24.7	
	Max.	34.2	33.3	33.7	9.7	9.5	9.4	9.8	9.4	9.4	8.4	8.4	8.4	2.4	2.5	2.4	8.0	9.0	7.0	22.2	25.2	27.4	
WSR37	Avg.	32.7	32.7	32.9	8.9	8.7	9.1	8.9	8.7	9.1	8.3	8.3	8.3	2.0	2.1	2.1	4.1	3.0	3.7	21.3	23.0	26.0	
	Min.	30.9	31.3	31.5	8.1	8.2	8.3	8.1	8.2	8.3	8.2	8.1	8.1	1.5	1.8	1.5	2.5	2.5	2.5	19.8	21.1	25.0	
	Max.	34.1	33.7	33.8	9.6	9.3	9.8	9.5	9.2	9.8	8.4	8.4	8.4	2.4	2.5	2.6	26.0	14.0	28.0	22.4	25.1	27.5	

**Table 3.5 Summary of Regular Impact Water Quality Monitoring Results (Mid-Ebb)**

Location		Parameter																				
		Salinity (ppt)			Dissolved Oxygen (mg/L)						pH			Turbidity (NTU)			Suspended Solids (mg/L)			Temp. (°C)		
					Surface & Middle			Bottom														
		Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May
CE	Avg.	32.7	32.5	32.7	8.9	8.8	8.8	8.9	8.8	8.7	8.2	8.2	8.3	2.8	2.9	2.9	3.0	2.9	2.7	21.2	22.9	25.9
	Min.	31.2	31.3	30.5	8.3	8.4	8.2	8.4	8.4	8.3	8.1	8.2	8.2	2.4	2.6	2.6	2.5	2.5	2.5	20.2	20.7	24.9
	Max.	34.3	33.5	33.4	9.5	9.7	9.4	9.5	9.6	9.3	8.4	8.4	8.4	3.3	3.7	3.2	8.0	8.0	4.0	22.2	24.8	27.4
CF	Avg.	32.6	32.7	32.5	9.0	8.7	9.1	9.0	8.7	9.0	8.3	8.3	8.2	2.4	2.5	2.5	3.1	2.9	3.4	21.1	22.9	26.0
	Min.	30.9	31.6	31.0	8.2	8.2	8.3	8.2	8.3	8.3	8.1	8.1	8.1	2.0	2.2	2.1	2.5	2.5	2.5	20.0	20.6	24.9
	Max.	34.2	33.5	33.7	9.5	9.4	9.8	9.4	9.4	9.6	8.4	8.4	8.4	2.9	3.0	3.0	9.0	7.0	26.0	22.0	24.8	27.5
WSR1	Avg.	32.7	32.5	32.9	8.9	8.8	8.9	8.9	8.8	8.9	8.2	8.3	8.3	2.1	2.1	2.1	3.5	3.4	3.7	21.1	23.0	25.8
	Min.	30.8	31.6	31.6	8.3	8.3	8.3	8.3	8.3	8.3	8.0	8.2	8.2	1.7	1.6	1.7	2.5	2.5	2.5	19.8	20.9	25.0
	Max.	33.8	33.6	33.7	9.5	9.8	9.6	9.6	9.9	9.5	8.4	8.4	8.5	2.5	2.5	2.5	9.0	8.0	27.0	22.3	25.3	27.1
WSR2	Avg.	32.6	32.4	32.6	8.9	8.8	8.8	8.8	8.8	8.8	8.2	8.3	8.3	2.1	2.1	2.1	3.6	3.2	3.7	21.1	23.0	25.8
	Min.	30.3	31.3	31.4	8.3	8.3	8.2	8.3	8.3	8.2	8.1	8.1	8.1	1.7	1.6	1.8	2.5	2.5	2.5	20.0	20.9	24.5
	Max.	33.8	33.5	33.4	9.4	9.6	9.3	9.4	9.6	9.3	8.3	8.4	8.5	2.4	2.4	2.4	15.0	7.0	29.0	22.2	24.9	27.2
WSR3	Avg.	32.6	32.8	32.4	8.7	8.9	8.8	8.7	8.9	8.8	8.3	8.2	8.2	2.1	2.1	2.1	3.1	3.1	4.5	21.3	23.0	26.0
	Min.	31.0	31.5	31.0	8.3	8.4	8.3	8.4	8.4	8.3	8.1	8.1	8.1	1.8	1.7	1.6	2.5	2.5	2.5	19.9	21.2	24.8
	Max.	34.0	33.7	33.0	9.3	9.4	9.5	9.3	9.4	9.5	8.4	8.4	8.5	2.5	2.5	2.4	9.0	7.0	60.0	22.5	25.2	27.5
WSR4	Avg.	32.7	32.8	32.4	9.0	8.9	8.9	9.0	8.9	8.9	8.2	8.2	8.3	2.0	2.1	2.1	3.2	3.2	3.7	21.1	23.0	26.0
	Min.	30.1	31.9	30.9	8.4	8.2	8.3	8.3	8.2	8.4	8.0	8.1	8.1	1.6	1.6	1.6	2.5	2.5	2.5	19.9	20.9	24.9
	Max.	34.5	33.9	33.3	9.5	9.5	9.3	9.5	9.5	9.4	8.4	8.4	8.4	2.5	2.5	2.4	7.0	9.0	24.0	22.2	25.3	27.1
WSR16	Avg.	32.7	32.6	32.4	8.9	8.7	8.9	8.8	8.7	8.9	8.2	8.2	8.2	2.1	2.1	2.1	3.8	3.0	4.7	21.0	23.1	25.8
	Min.	31.0	31.2	30.8	8.5	8.3	8.4	8.4	8.3	8.3	8.0	8.1	8.1	1.6	1.7	1.7	2.5	2.5	2.5	19.9	21.1	24.6
	Max.	34.2	33.6	33.4	9.4	9.8	9.4	9.4	9.8	9.4	8.4	8.4	8.4	2.4	2.5	2.4	20.0	8.0	45.0	21.9	25.4	27.5
WSR33	Avg.	32.6	32.5	32.4	8.8	9.0	8.9	8.8	9.0	8.9	8.3	8.2	8.3	2.1	2.1	2.1	3.6	3.2	3.9	21.1	23.0	26.1
	Min.	30.4	31.3	30.7	8.3	8.4	8.4	8.3	8.5	8.4	8.1	8.1	8.1	1.7	1.6	1.6	2.5	2.5	2.5	20.0	20.6	24.7
	Max.	34.0	33.5	33.5	9.2	9.8	9.4	9.2	9.7	9.3	8.4	8.4	8.4	2.5	2.4	2.4	9.0	8.0	26.0	22.5	24.8	27.5
WSR36	Avg.	32.5	32.3	32.6	8.7	8.8	8.9	8.7	8.8	8.9	8.3	8.2	8.3	2.1	2.1	2.1	3.9	3.4	3.4	21.1	23.0	25.9
	Min.	30.1	31.1	31.4	8.3	8.2	8.3	8.3	8.2	8.4	8.0	8.1	8.2	1.7	1.8	1.7	2.5	2.5	2.5	20.0	20.7	24.9
	Max.	33.7	33.3	33.7	9.4	9.6	9.5	9.4	9.5	9.5	8.4	8.4	8.4	2.5	2.4	2.5	12.0	9.0	8.0	22.4	25.1	27.3
WSR37	Avg.	32.5	32.5	32.5	8.8	8.8	8.8	8.8	8.8	8.8	8.3	8.3	8.3	2.1	2.1	2.1	3.7	3.2	3.5	21.1	23.0	26.0
	Min.	30.8	31.4	31.6	8.3	8.2	8.3	8.3	8.3	8.3	8.0	8.2	8.2	1.7	1.6	1.6	2.5	2.5	2.5	19.9	21.1	24.6
	Max.	34.2	33.4	33.3	9.7	9.4	9.4	9.7	9.4	9.4	8.4	8.4	8.4	2.6	2.4	2.4	12.0	8.0	9.0	22.5	25.1	27.6

#### 4. WASTE

The waste generated from this Project includes inert construction and demolition (C&D) materials, and non-inert C&D materials. Non-inert C&D materials are made up of general refuse, vegetative wastes, and recyclable wastes such as plastics and paper/cardboard packaging waste. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting period are summarized in **Table 4.1**. Details of cumulative waste management data are presented as a waste flow table in **Appendix G**.

**Table 4.1 Quantities of Waste Generated from the Project during reporting period**

Reporting Months	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics <sup>(1)</sup>	Chemical Waste	Others, e.g. general refuse
	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)	(in ,000kg)
March 2023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	205.410
April 2023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	255.720
May 2023	2088.990	0.000	0.000	0.000	2088.990	0.000	0.000	0.000	0.000	0.000	202.270

Notes: (1) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

## 5. LANDFILL GAS MONITORING

### 5.1. MONITORING REQUIREMENT

In accordance with Section 11 of the EM&A Manual, monitoring of landfill gas is required for construction works within the 250m Consultation Zone. Part of the desalination plant and the indicative area of natural slope mitigation works fall within the SENT Landfill Extension Consultation Zone; and part of the 1,200 mm diameter fresh water mains along Wan Po Road falls within the SENT Landfill and SENT Landfill Extension Consultation Zones, TKO Stage II/III Restored Landfill and TKO Stage I Restored Landfill Consultation Zones.

### 5.2. MONITORING LOCATION

Monitoring of oxygen, methane, carbon dioxide and barometric pressure was performed for excavations at 1m depth or more within the consultation Zone.

During construction of works within the consultation zones, excavations of 1m depth or more was monitored:

- At the ground surface before excavation commences;
- Immediately before any worker enters the excavation;
- At the beginning of each working day for the entire period the excavation remains open; and
- Periodically through the working day whilst workers are in the excavation.

For excavations between 300mm and 1m deep, measurements should be carried out:

- Directly after the excavation has been completed; and
- Periodically whilst the excavation remains open.

### 5.3. MONITORING PARAMETERS

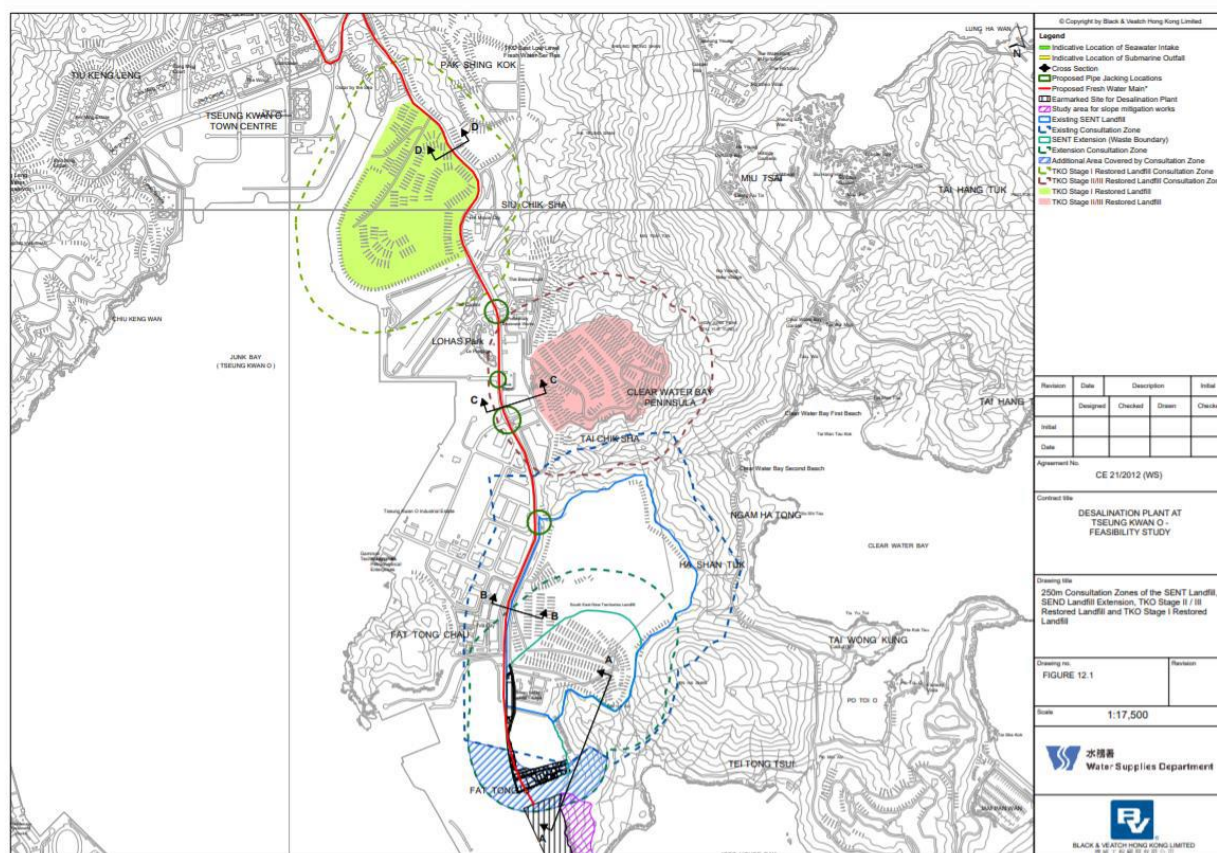
LFG monitoring was carried out to identify any migration between the landfill and the Project and to ensure the safety of the construction, operation and maintenance personnel working on-site, visitors and any other person within the Project area.

The following parameters were monitored:

- Methane.
- Oxygen.
- Carbon Dioxide.
- Barometric Pressure.

## 5.4. MONITORING LOCATION

The area required to be monitored for landfill gas in the reporting period is shown in **Figure 5.1**.



**Figure 5.1 Overview of the SENT Extension Consultation Zone and the Project Site Area**

## 5.5. ACTION AND LIMIT LEVEL

Action and Limit Level are provided in **Table 5.1**.

**Table 5.1 Action and Limit Level for Landfill Gas Monitoring**

Parameters	Action Level	Limit Level
Oxygen (O <sub>2</sub> )	<19% O <sub>2</sub>	<19% O <sub>2</sub>
Methane (CH <sub>4</sub> )	>10% LEL	>20% LEL
Carbon Dioxide (CO <sub>2</sub> )	>0.5% CO <sub>2</sub>	>1.5% CO <sub>2</sub>

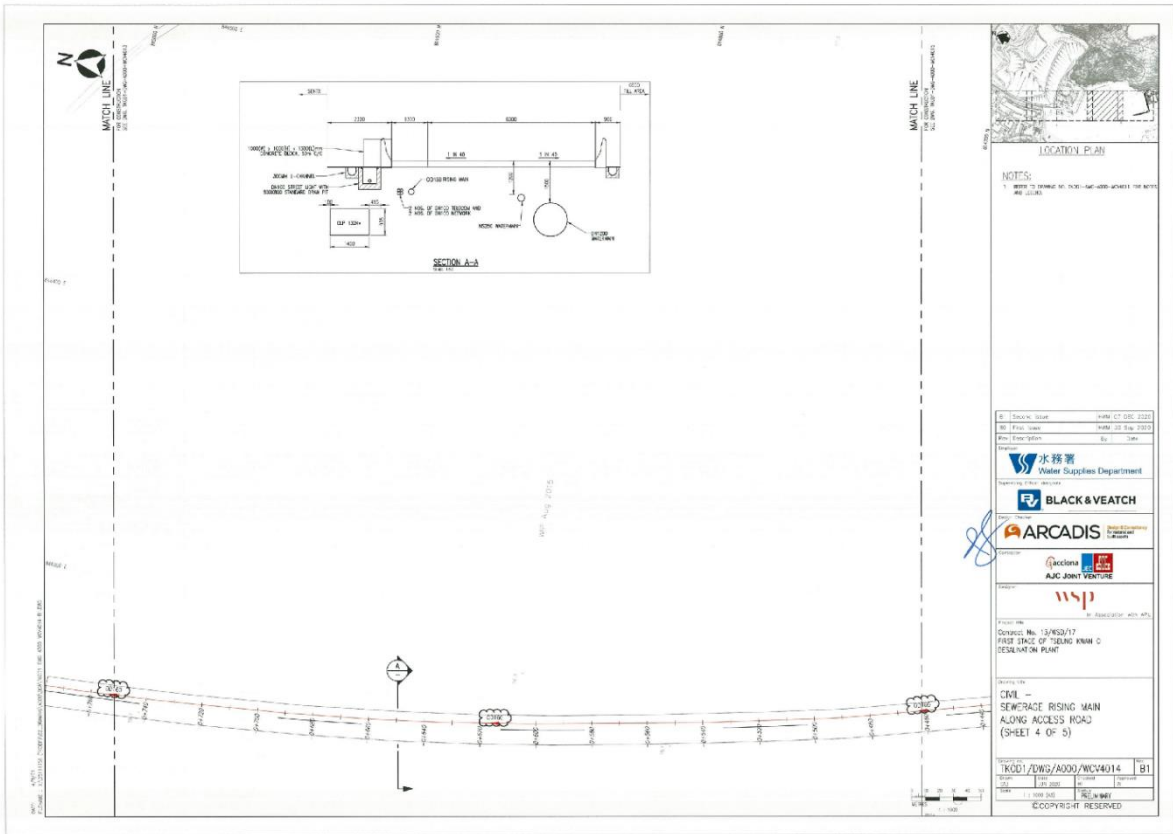
## 5.6. MONITORING EQUIPMENT

The monitoring equipment used in the reporting period could be referring to Section 5.10 – 5.11 of the Monthly EM&A Report.

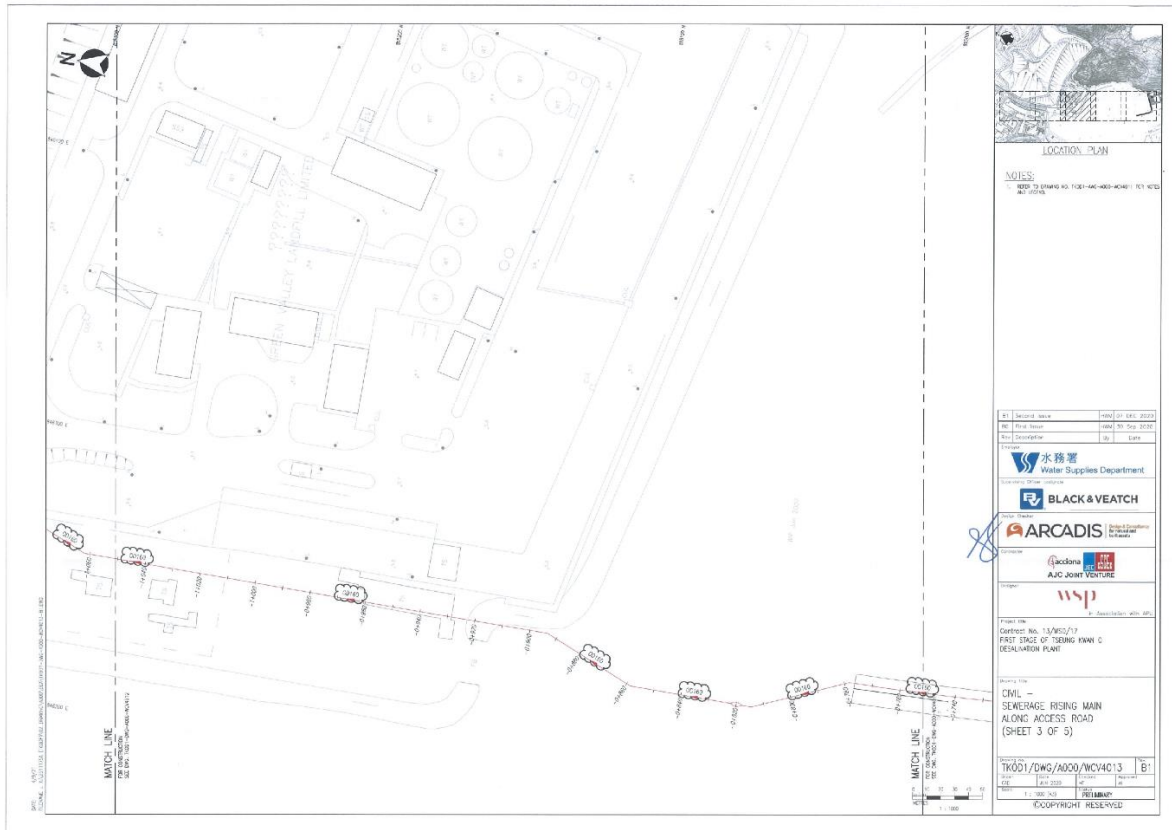
## 5.7. MONITORING RESULTS AND OBSERVATIONS

In this reporting period, 146 times of landfill gas monitoring were recorded at Wan Po Road (Ch0+390 – Ch0+780). No exceedance of action and limit levels for methane, oxygen and carbon dioxide was observed. Monitoring was conducted during excavations at 1m depth or more within the consultation zone and whenever workers entered the excavation on the day. The Location Map for Landfill Gas Monitoring at TKO Area 137 are shown in **Figure 5.2** and **5.3**.





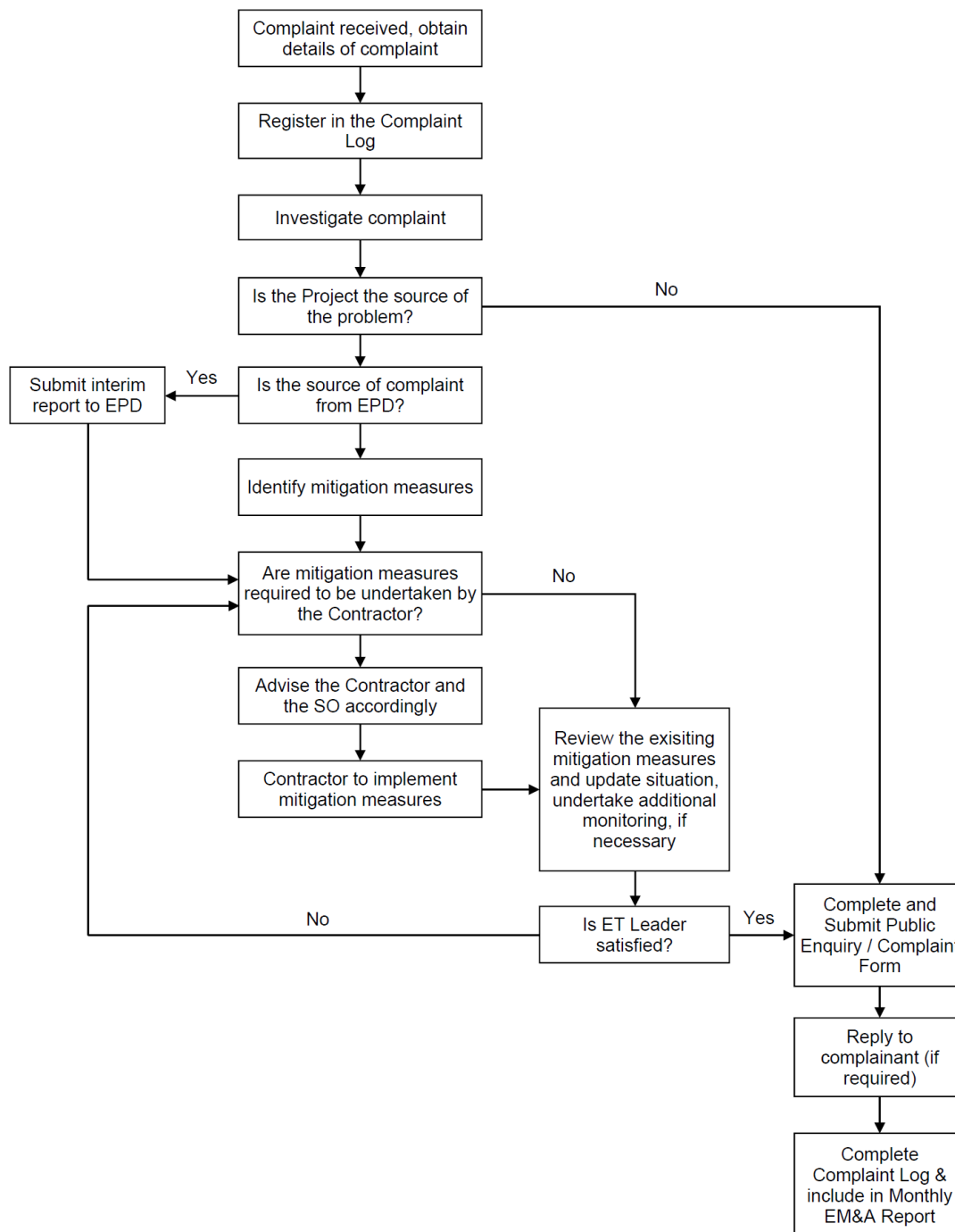
**Figure 5.2 Location Map for Landfill Gas Monitoring at TKO Area 137 (-0+440 - -0+760)**



**Figure 5.3 Location Map for Landfill Gas Monitoring at TKO Area 137 (-0+740 - -1+060)**

## 6. SUMMARY OF EXCEEDANCE, COMPLAINT, NOTIFICATION OF SUMMONS AND PROSECUTIONS

The Environmental Complaint Handling Procedure is shown in below **Figure 6.1**:



**Figure 6.1 Environmental Complaint Handling Procedures**



No noise monitoring was conducted during the reporting period since there are no Contract-related construction activities undertaken within a radius of 300m from the monitoring locations. No Action Level exceedance was recorded during the reporting period.

The EM&A works for water quality were conducted during the reporting period in accordance with the EM&A Manual.

During the reporting period, one hundred and twenty-nine (129) of the general water quality monitoring results of SS obtained had exceeded the Action Level. One hundred and six (106) of the general water quality monitoring results of SS obtained during the reporting quarter had exceeded the Limit Level.

After investigation, all exceedances were considered non-project related.

In this reporting period, 146 times of landfill gas monitoring were recorded at Wan Po Road (Ch0+390 – Ch0+780). No exceedance of action and limit levels for methane, oxygen and carbon dioxide was observed. Monitoring was conducted during excavations at 1m depth or more within the consultation zone and whenever workers entered the excavation on the day.

ET will keep closely monitoring the performance of Contractor, implementation of water quality mitigation measure and other contamination issue around the Project site, to ensure the EM&A requirement is properly implemented.

No environmental complaint, notification of summons and prosecution was received in the reporting period.

Statistics on complaints and regulatory compliance are summarized in **Appendix H**.

## 7. EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract.

Joint site inspections were also carried out by ET and IEC on 7, 14, 22 and 31 March 2023, 4, 11, 18 and 24 April 2023, and 2, 9, 16, 23 and 30 May 2023.

Minor deficiencies were observed during weekly site inspection. Key observations during the site inspections are summarized below:

- Chemical tanks found near the RO Building shall be properly stored or on a drip tray to prevent leakage. The broken chemical label shall be also replaced asap.
- Chemical containers found near the Chemical Building shall be properly stored or placed on a drip tray to prevent leakage.
- The chemical containers found near mechanic workshop, combined Shaft area shall be properly stored or stored on a drip tray.
- Oil drums found near the shall be provided a proper storage or drip tray to prevent oil leakage.
- Chemical containers found near the South end of the site near the slope shall be provided with a proper storage or drip tray to prevent leakage.

The Contractor has rectified the observations identified during environmental site inspections in the reporting period.

According to the EIA Study Report, Environmental Permit, contract documents and EM&A Manual, the mitigation measures detailed in the documents should be implemented as much as practical during the reporting period. An updated Implementation Status of Environmental Mitigation Measures (EMIS) is provided in **Appendix C**.

## 8. CONCLUSIONS AND RECOMMENDATIONS

This is the 13<sup>th</sup> Quarterly EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 March 2023 to 31 May 2023, in accordance with the EM&A Manual and the requirement under FEP-01/503/2015/A.

No noise monitoring was conducted in the reporting period due to the over distant monitoring station from the works location.

During the reporting period, one hundred and twenty-nine (129) of the general water quality monitoring results of SS obtained had exceeded the Action Level. One hundred and six (106) of the general water quality monitoring results of SS obtained during the reporting quarter had exceeded the Limit Level.

After investigation, all exceedances were considered non-project related.

In this reporting period, 146 times of landfill gas monitoring were recorded at Wan Po Road (Ch0+390 – Ch0+780). No exceedance of action and limit levels for methane, oxygen and carbon dioxide was observed. Monitoring was conducted during excavations at 1m depth or more within the consultation zone and whenever workers entered the excavation on the day.

Weekly environmental site inspection was conducted during the reporting period. Minor deficiency was observed during site inspection and was rectified. The environmental performance of the project was therefore considered satisfactory.

According to the environmental site inspections performed in the reporting period, the Contractor is reminded to pay attention on maintaining proper materials storage.

No environmental complaint, notification of summons or prosecution was received since commencement of the Contract.

The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

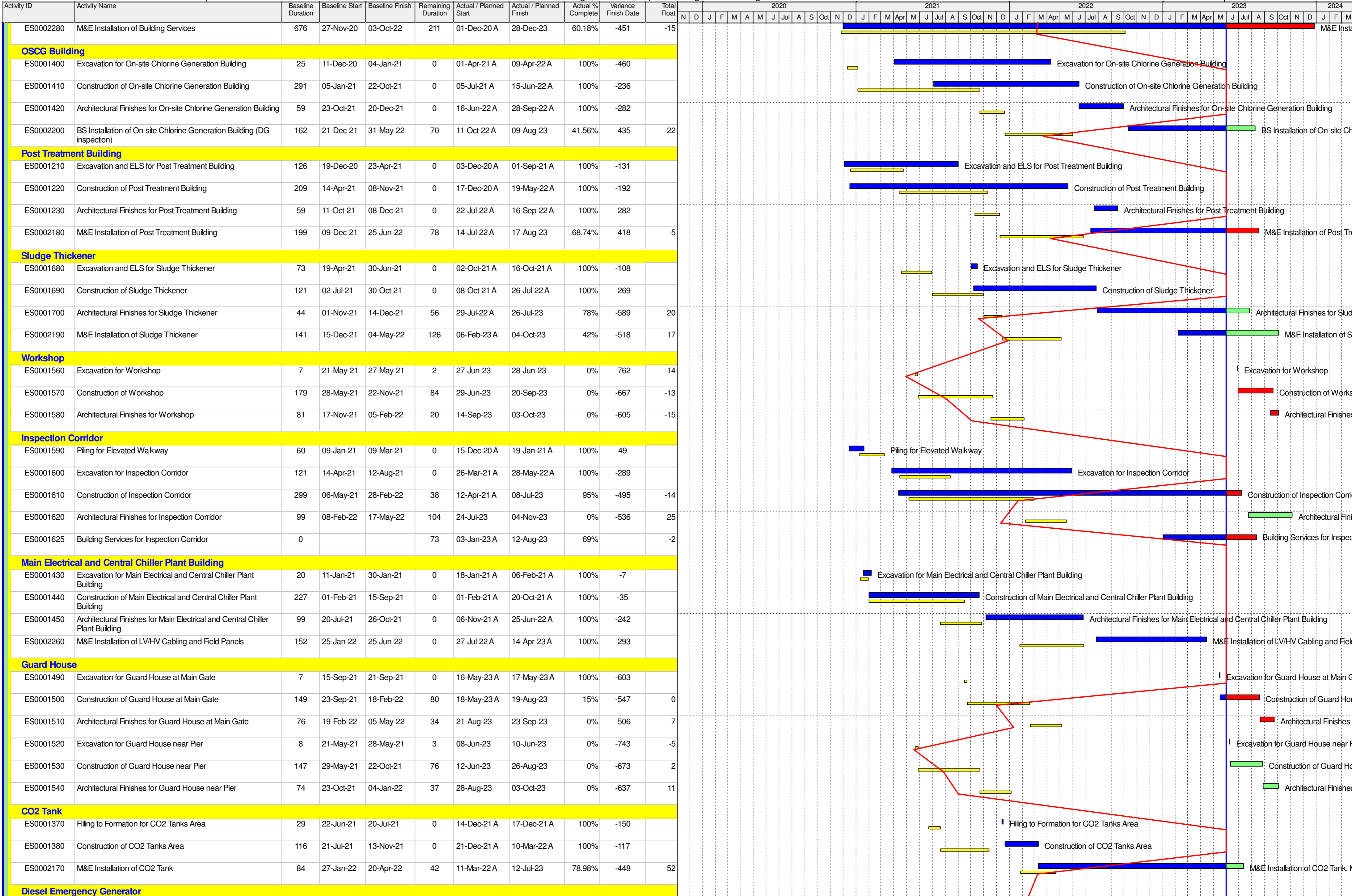
# Appendix A

## Master Programme









Summary Bar	Actual Work	Target Milestone
Actual Level of Effort	Early Bar	Milestone
Target Bar	Critical Bar	





Activity ID	Activity Name	Baseline Duration	Baseline Start	Baseline Finish	Remaining Duration	Actual / Planned Start	Actual / Planned Finish	Actual % Complete	Variance Finish Date	Total Float	Gantt Chart																																																					
											2020												2021												2022												2023												2024					
												N	D	J	F	M	A	M	J	Jul	A	S	Oct	N	D	J	F	M	Apr	M	J	Jul	A	S	Oct	N	D	J	F	M	Apr	M	J	Jul	A	S	Oct	N	D	J	F	M	Apr	M	J	Jul	A	S	Oct	N	D	J	F	M
ES0002250	M&E Diesel Emergency Generator	57	25-Feb-22	22-Apr-22	80	16-Jan-23 A	19-Aug-23	60%	-484	51																																																						
<b>Switch Room and Transformer Installation</b>																																																																
ES0002300	M&E Installation of HV/LV Switchroom and Transformer	242	16-Nov-21	15-Jul-22	0	24-Jul-22 A	20-Apr-23 A	100%	-279																																																							
<b>Miscellaneous</b>																																																																
ES0001630	Remaining Architectural Finishes for All Buildings	322	11-Jan-22	28-Nov-22	192	09-Dec-22 A	09-Dec-23	46%	-376	4																																																						
ES0001640	External Process and Non-Process Pipe	655	18-Dec-20	03-Oct-22	105	27-May-21 A	13-Sep-23	92%	-345	-6																																																						
ES0001650	Drainage and Cable Duct	518	04-Jun-21	03-Nov-22	24	25-Apr-22 A	24-Jun-23	95%	-233	48																																																						
ES0001660	Slope Mitigation and Maintenance Access	684	23-Nov-20	07-Oct-22	189	28-Sep-21 A	06-Dec-23	20%	-425	1																																																						
ES0001670	Landscaping Works	469	28-Oct-21	08-Feb-23	195	01-Mar-23 A	12-Dec-23	6%	-307	1																																																						
ES0002290	M&E PV Panels	215	23-Nov-21	25-Jun-22	168	05-Jan-23 A	15-Nov-23	6%	-508	28																																																						
ES0002310	M&E Chiller & Irrigation System Installation	298	27-Oct-21	20-Aug-22	73	12-Apr-22 A	12-Aug-23	55.83%	-357	-2																																																						
ES0002350	M&E Installation of Surge Vessel	70	24-Feb-22	04-May-22	64	13-Jul-23	14-Sep-23	0%	-498	22																																																						
ES0002390	M&E Installation of Thickened Sludge Holding Tank	42	09-Dec-21	19-Jan-22	47	27-Mar-23 A	17-Jul-23	5.4%	-544	96																																																						
<b>Statutory Submission &amp; Inspection</b>																																																																
ES0002330	Statutory Submission & Inspection	1148	11-Jan-20	03-Mar-23	209	03-Dec-19 A	26-Dec-23	84.37%	-298	-13																																																						
<b>Testing and Commissioning</b>																																																																
ES0002400	M&E Precommissioning	229	12-Jun-22	26-Jan-23	133	22-Apr-23 A	11-Oct-23	3.77%	-258	20																																																						
ES0002410	M&E Commissioning	213	04-Jul-22	01-Feb-23	179	02-Jun-23	27-Nov-23	0%	-299	-18																																																						
ES0002420	M&E Performance Test	40	02-Feb-23	13-Mar-23	66	27-Oct-23	31-Dec-23	0%	-293	-18																																																						



## Appendix B

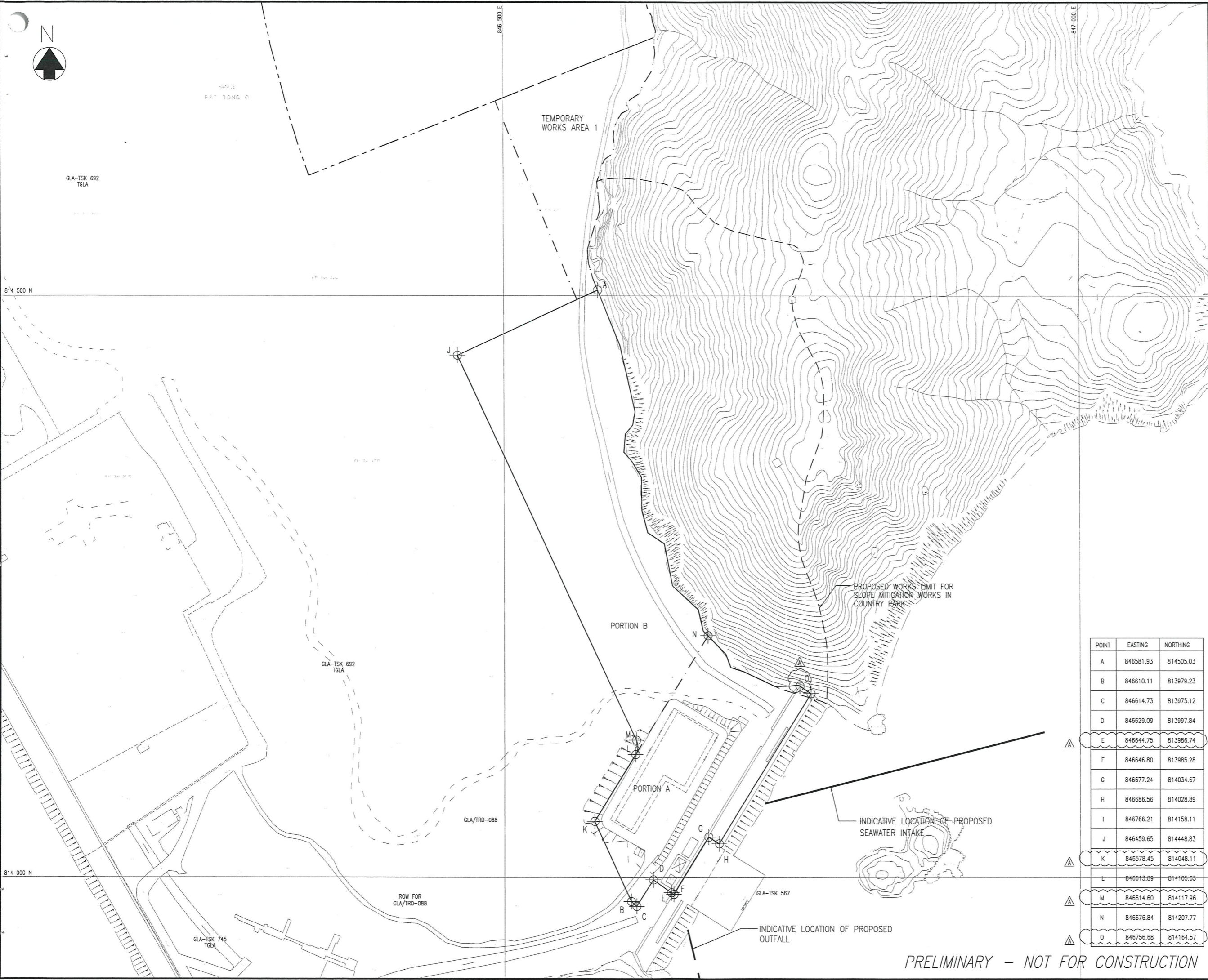
# Overview of Desalination Plant in Tseung Kwan O

LEGEND:

- BOUNDARY OF SENT LANDFILL EXTENSION
- BOUNDARY OF WORKS AREA FOR TKO DESALINATION PLANT
- SITE PHASING
- ALLOCATED LAND BOUNDARIES

NOTE:

TEMPORARY WORKS AREA 1 WILL BE HANDED OVER AT +6 MPD WITH A TOLERANCE OF ±500mm.



B	10/03	UPDATE NOTES	YLC
A	07/18	UPDATE COORDINATES	YLC
Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial	YLC	CKH	SZ
Date	02/18	02/18	02/18

Approved  
*Christina Go*

Agreement No. CE 8/2015 (WS)

Contract No. 13/WSD/17

Contract Title  
DESIGN, BUILD AND OPERATE FIRST STAGE OF TSEUNG KWAN O DESALINATION PLANT

Drawing Title  
SITE HANDOVER WORKS AREAS

Drawing No.	Revision
190495/K/TEND/10/0003	B

Scale A1 1 : 1500  
A3 1 : 3000



POINT	EASTING	NORTHING
A	846581.93	814505.03
B	846610.11	813979.23
C	846614.73	813975.12
D	846629.09	813997.84
E	846644.75	813986.74
F	846646.80	813985.28
G	846677.24	814034.67
H	846686.56	814028.89
I	846766.21	814158.11
J	846459.65	814448.83
K	846578.45	814048.11
L	846613.89	814105.63
M	846614.60	814117.96
N	846676.84	814207.77
O	846756.68	814164.57

PRELIMINARY - NOT FOR CONSTRUCTION



BUILDINGS IN FIRST STAGE

CODE	NAME OF BUILDING	TOTAL G.F.A. (m <sup>2</sup> )	SITE COVERAGE (m <sup>2</sup> )
B	COMBINE SHAFT	759,876	759,876
C	ACTIDAFF	1027,547	545,346
G	REVERSE OSMOSIS BUILDING AND ELECTRICAL BUILDING	451,455	536,935
H	CO2 TANKS AREA	-	-
J	PRODUCT WATER STORAGE TANK, PUMP STATION AND ELECTRICAL BUILDING	1974,610	2933,980
K	SLUDGE TREATMENT BUILDING, TANK AND PUMP ROOM	2531,044	1228,361
M	ADMINISTRATION BUILDING & ELECTRICAL BUILDING C	2450,713	1114,062
N	MAIN ELECTRICAL AND CENTRAL CHILLER PLANT BUILDING	-	499,893
R1	ELECTROCHLORINATION BUILDING & ELECTRICAL BUILDING A	657,992	825,776
S	132 KV SUBSTATION	-	943,560
T	IRRIGATION WATER TANK AND PUMP ROOM	-	156,148
R2	CHEMICAL BUILDING	813,056	813,056
V	VISITOR GALLERY	1330,410	1330,410
X1	GUARD HOUSE AND FS CONTROL ROOM	39,585	39,585
X2	GUARD HOUSE	22,035	22,035
Y	R + D OUTDOOR	-	-
Z	WASTE WATER TREATMENT PLANT	48,000	48,000
TOTAL =		25175,323	21490,023

LEGEND / ABBREVIATION

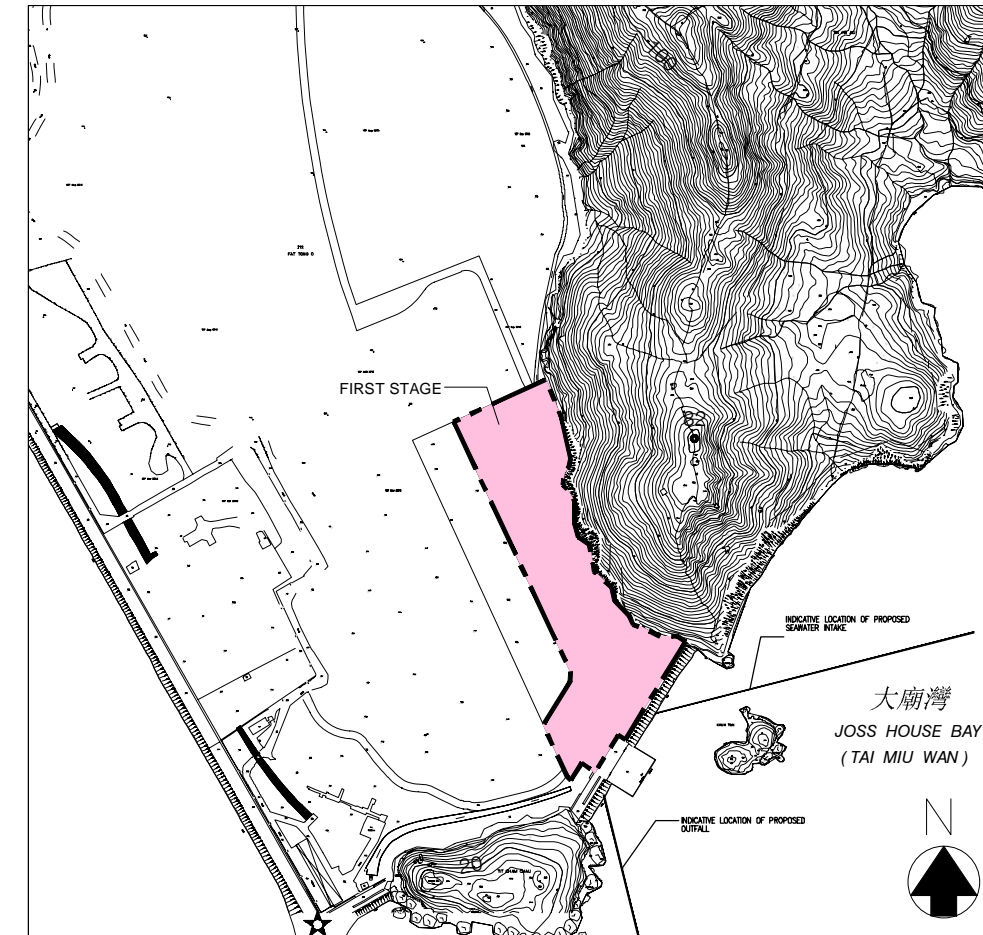
- H.L. WINDOW HIGH LEVEL WINDOW
- M.L. METAL LOUVRES
- C.L. CAT LADDER
- A.U.T. ACCESSIBLE UNISEX TOILET
- ⊕ PROPOSED FINISH FLOOR LEVEL IN METER ABOVE P.D.
- ⊖ STRUCTURAL FLOOR LEVEL IN METER ABOVE P.D.
- M.V.I.A.L. MECHANICAL VENTILATION & ARTIFICIAL LIGHTING
- F.E. 4.5kg CO<sub>2</sub> FIRE EXTINGUISHER
- H.R. HOSE REEL
- ⊙ FIREMANS LIFT
- ⊙ LIFT FOR THE BARRIER FREE ACCESS
- P.D. PIPE DUCT

PLOT RATIO & SITE COVERAGE CALCULATION:

SITE AREA OF THE FIRST STAGE	=	56108 m <sup>2</sup>
TOTAL G.F.A.	=	25092.141 m <sup>2</sup>
TOTAL SITE COVERAGE	=	21414.841 m <sup>2</sup>
PLOT RATIO	=	25092.141 / 56108
	=	0.447 < PERMITTED
SITE COVERAGE	=	21414.841 / 56108 x 100
	=	38.167%

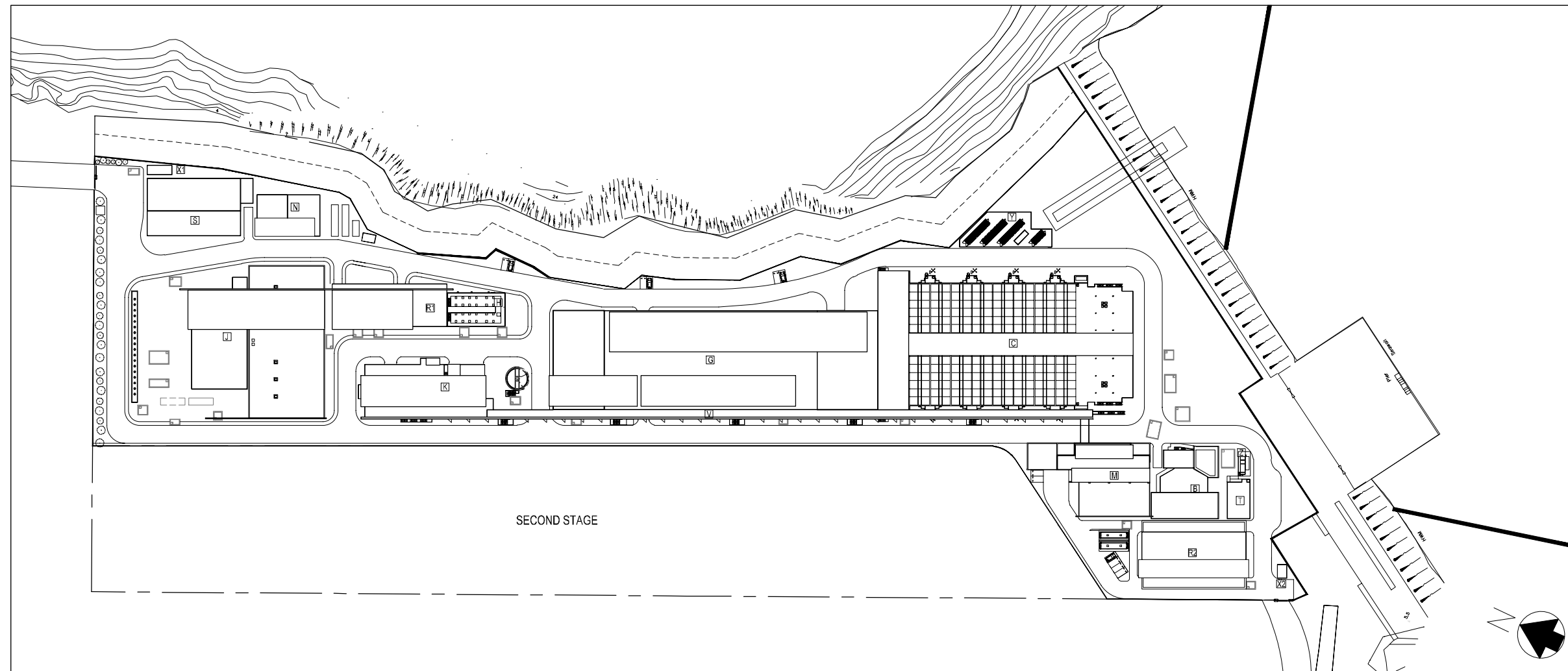
SITE LOCATION PLAN

1 : 5000



FIRST STAGE OF TSEUNG KWAN O DESALINATION PLANT

1 : 1000



0	TENDER SUBMISSION	CAD	JAN 19
Rev	Description	By	Date
Employer			
Employer's Consultant			
Tenderer			
Designer			
Project title			
CONTRACT NO. 13/WSD/17			
DESIGN, BUILD AND OPERATE FIRST STAGE OF TSEUNG KWAN O DESALINATION PLANT			
Drawing title			
ARCHITECTURAL – PLOT RATIO AND SITE COVERAGE CALCULATION, LEGEND ABBREVIATION			
Drawing no.		Rev.	
TKO/AJC/W/A000/AR/001		0	
Drawn	Date	Checked	Approved
OKAL	JAN 19	S.C.	T.C.
Scale	N.T.S.	Status	-

## Appendix C

# Summary of Implementation Status of Environmental Mitigation

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
				D	C	O		
<b>Air Quality</b>								
S4.8.1	Impervious dust screen or sheeting will be provided to enclose scaffolding from the ground floor level of building for construction of superstructure of the new buildings.	Land site/ During Construction	Contractor(s)		✓		Implemented	Air Pollution Control (Construction Dust)
S4.8.1	Impervious sheet will be provided for skip hoist for material transport.	Land site/ During Construction	Contractor(s)		✓		NA	-
S4.8.1	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 site/ During Construction	Contractor(s)		✓		Implemented	-
S4.8.1	All dusty materials should be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation.	Land site/ During Construction	Contractor(s)		✓		Implemented	-
S4.8.1	Dropping heights for excavated materials should be controlled to a practical height to minimize the fugitive dust arising from unloading.	Land site/ During Construction	Contractor(s)		✓		Implemented	-
S4.8.1	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 site/ During Construction	Contractor(s)		✓		Implemented	-
S4.8.1	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 site/ During Construction	Contractor(s)		✓		Implemented	-
S4.8.1	Road sections between vehicle-wash areas and vehicular entrance will be paved.	Land site/ During Construction	Contractor(s)		✓		Implemented	-
S4.8.1	Hoarding of not less than 2.4m high from ground level will be provided along the length of the Project Site boundary.	Land site/ During construction	Contractor(s)	✓	✓		N/A	-
S4.8.1	Haul roads will be kept clear of dusty materials and will be sprayed with water so as to maintain the entire road surface wet at all times.	Land site/ During construction	Contractor(s)		✓		Implemented after reminder	-
S4.8.1	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 site/ During construction	Contractor(s)		✓		Implemented after reminder	-

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
				D	C	O		
S4.8.1	Stockpiles of more than 20 bags of cement, dry pulverized fuel ash and dusty construction materials will be covered entirely by impervious sheeting sheltered on top and 3-sides.	Land site/ During construction	Contractor(s)		✓		N/A	-
S4.8.1	All exposed areas will be kept wet always to minimize dust emission.	Land site/ During construction	Contractor(s)		✓		Implemented after reminder	-
S4.8.1	Ultra-low-Sulphur diesel (ULSD) will be used for all construction plant on-site, as defined as diesel fuel containing not more than 0.005% Sulphur by weight) as stipulated in Environment, Transport and Works Bureau Technical Circular (ETWB-TC(W)) No 19/2005 on Environmental Management on Construction Sites.	Land site/ During construction/ During Operation	Contractor(s)		✓	✓	Implemented	Environment, Transport and Works Bureau Technical Circular (ETWB-TC(W)) No 19/2005 on Environmental Management on Construction Sites
S4.8.1	The engine of the construction equipment during idling will be switched off.	Land site/ During construction	Contractor(s)		✓		Implemented	-
S4.8.1	Concrete batching plant will be required on site. control measures recommended in the Guidance Note on a Best Practicable Means for Cement Works (Concrete Batching Plant) (BPM 3/2 (93)) will be implemented. The control measures recommended in the Guidance Note on a Best Practicable Means for Cement Works (Concrete Batching Plant) (BPM 3/2 (93)) will be implemented.	Land site/ During construction	Contractor(s)		✓		N/A	-
S4.8.1	Regular maintenance of construction equipment deployed on-site will be conducted to prevent black smoke emission.	Land site/ During construction	Contractor(s)		✓		Implemented	-
S4.10	To ensure proper implementation of the recommended dust mitigation measures and good construction site practices during the construction phase, environmental site audits on weekly basis is recommended throughout the construction period.	Land site/ During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		Implemented	-
<b>Noise</b>								
S5.7	Only well-maintained plant will be operated on-site, and plant will be serviced regularly during the construction phase.	All area/ During construction	Contractor(s)		✓		Implemented	A Practical Guide for the Reduction of Noise from Construction Works A Practical Guide for the Reduction of Noise from Construction Works



EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
				D	C	O		
S5.7	Silencers or mufflers on construction equipment will be utilized and will be properly maintained during the construction phase.	Noise control/ During construction	Contractor(s)		✓		N/A	-
S5.7	Mobile plant, if any, will be sited as far away from NSRs as possible.	Noise control/ During construction	Contractor(s)		✓		N/A	-
S5.7	Machines and plant (such as trucks) that may be in intermittent use will be shut down between work periods or will be throttled down to a minimum.	Noise control/ During construction	Contractor(s)		✓		Implemented	-
S5.7	Plants known to emit noise strongly in one direction will, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.	Noise control/ During construction	Contractor(s)		✓		N/A	-
S5.7	Material stockpiles and other structures will be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	Noise control/ During construction	Contractor(s)		✓		N/A	-
S5.7	Use of Quiet Powered Mechanical Equipment (QPME).	Noise control/ During construction	Contractor(s)		✓		Implemented	-
S5.7	Movable noise barriers of 3m in height with skid footing should be used and located within a few meters of stationary plant and mobile plant such that the line of sight to the NSR is blocked by the barriers. The length of the barrier should be at least five times greater than its height. The noise barrier material should have a superficial surface density of at least 7 kg m <sup>-2</sup> and have no or gappeningss.	Noise control/ During construction	Contractor(s)		✓		N/A	-
S5.7	The noise insulating sheet should be deployed such that there would be no opening or gaps on the joints.	Noise control/ During construction	Contractor(s)		✓		N/A	-
S5.7	Construction activities (e.g., excavation/shoring, reinstatement (asphalt), and pipe jacking) will be planned and carried out in sequence, such that items of PME proposed for these activities will not be operated simultaneously.	Noise control/ During construction	Contractor(s)	✓	✓		Implemented	-
S5.7	PMEs will not be used at the works areas near educational institutions with residual impact (i.e., the "influence area" within a radius of 40m) during school hours in order to reduce impact to the educational institutions.	Noise control / During construction	Contractor(s)		✓		N/A	-

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
				D	C	O		
S5.7	Noise enclosures or acoustic sheds would be used to cover stationary PME such as generators. Portable/Movable noise enclosure made of material with superficial surface density of at least 7 kg m <sup>-2</sup> may be used for screening the noise from operation of the saw/groover, concrete.	Noise control/ Pre-construction/ During construction	Contractor(s)	✓	✓		N/A	-
5.9	Sawcutting pavement, breaking up of pavement, excavation /shoring, pipe laying, backfilling, reinstatement (concrete) and pipe jacking shall be scheduled outside the examination period.	Noise control/ Pre-construction/ During construction	Contractor(s)	✓	✓		N/A	-
S5.9	In view the duration of noise exceedance at Creative Secondary School, PLK Laws Foundation College, TKO Kei Tak Primary School and School of Continuing and Professional Studies-CUHK is limited to 8 weeks, the construction work in the influence areas near the four schools shall be scheduled during long school holidays (eg summer holiday, Easter holiday or Christmas holiday, etc) as far as practicable. Scheduling the construction work for the four schools.	Noise control/ Pre-construction/ During construction	Contractor(s)	✓	✓		N/A	-
S5.10	A noise monitoring programme shall be implemented for the construction phase.	Designated monitoring stations as defined in EM&A Manual/During construction phase	Environmental Team		✓		N/A	-
S5.10	The effectiveness of on-site control measures could also be evaluated through the regular site audits.	All facilities/ During construction	Contractor(s)/ ET & IEC		✓		Implemented	-
<b>Water Quality</b>								
S6.9	Dredged marine sediment will be disposed of in a gazette marine disposal area in accordance with marine dumping permit conditions of the Dumping at Sea Ordinance (DASO).	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	Dumping at Sea Ordinance (DASO)
S6.9	Disposal vessels will be fitted with tight bottom seals in order to prevent leakage of material during transport.	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	-
S6.9	Barges will be filled to a level, which ensures that material does not spill over during transport to the disposal site and that adequate freeboard is maintained to ensure that the decks are not washed by wave action.	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	-
S6.9	After dredging, any excess materials will be cleaned from decks and exposed fittings before the vessel is moved from the dredging area.	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	-

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
				D	C	O		
S6.9	All vessels should be well maintained and inspected before use to limit any potential discharges to the marine environment.	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	-
S6.9	All vessels must have a clean ballast system.	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	-
S6.9	No discharge of sewage/grey wastewater should be allowed. Wastewater from potentially contaminated area on working vessels should be minimized and collected. These kinds of wastewater should be brought back to port and discharged at appropriate collection and treatment system.	Marine Dredging/ During construction	Contractor(s)		✓		Implemented	
S6.9	No soil waste is allowed to be disposed overboard.	Marine Dredging/ During construction	Contractor(s)		✓		N/A	
S6.9	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 site & drainage/ During construction	Contractor(s)		✓		Implemented	ProPECC PN 1/94 TM Standard under the WPCO
S6.9	Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms.	Land site & drainage/ During construction	Contractor(s)		✓		Implemented	-
S6.9	Appropriate surface drainage will be designed and provided where necessary.	Land site & drainage/ During construction	Contractor(s)		✓		Implemented	-
S6.9	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 site & drainage/ During construction	Contractor(s)	✓	✓		Implemented	ProPECC PN 1/94
S6.9	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 site & drainage/ During construction	Contractor(s)		✓		N/A	-

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
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S6.9	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 site & drainage/ During construction	Contractor(s)		✓		Implemented	-
S6.9	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 site & drainage/ During construction	Contractor(s)		✓		N/A	-
S6.9	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.	Land site & drainage/ During construction	Contractor(s)		✓		Implemented	-
S6.9 and S6.12	The sterilization water should be dechlorinated with total residual chlorine (TRC) level below 1 mg/L before discharge to public sewer. In situ testing of TRC should also be conducted for the discharge of chlorinated water for pipeline disinfection to ensure sufficient dechlorination before discharge to public sewer.	Sterilization of water mains prior to commissioning	Contractor(s)		✓	✓	N/A	Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems Inland and Coastal Waters
S6.9	The cleaning and flushing water should also be treated and desilted to the relevant discharge requirement stipulated in TM-DSS before discharging.	Sterilization of water mains prior to commissioning	Contractor(s)		✓	✓	Implemented	
S6.9	Site drainage should be well maintained, and good construction practices should be observed to ensure that oil, fuels, solvents and other chemicals are managed, stored and handled properly and do not enter the nearby water streams.	Land site & drainage/ During construction/ During operation	Contractor(s)		✓	✓	Implemented after reminder	-
S6.12	Regular site inspections will be carried out in order to confirm that regulatory requirements are being met and that contractors are implementing the standard site practice and mitigation measures as proposed to reduce potential impacts to water quality.	During construction	Contractor(s)/ ET & IEC		✓		Implemented	-
<b>Waste Management</b>								
S8.5	Nomination of approved personnel to be responsible for standard site practices, arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site.	Contract mobilization/ During construction	Contractor(s)		✓		Implemented	-

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
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S8.5	Training of site personnel in proper waste management and chemical handling procedures. Training will be provided to workers on the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling at the beginning of the construction works.	Contract mobilization/ During construction	Contractor(s)		✓		Implemented	-
S8.5	Provision of sufficient waste disposal points and regular collection for disposal.	All area/ During construction/ During operation	Contractor(s)		✓	✓	Implemented	DEVB TC(W) No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness.
S8.5	Appropriate measures to reduce windblown litter and dust transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	All area/ During construction	Contractor(s)		✓		Implemented	
S8.5	A waste management plan (WMP) as stated in the "ETWB TC(W) No. 19/2005, Environmental Management on Construction Sites" 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 area/ During construction	Contractor(s)		✓		Implemented	ETWB TC(W) No. 19/2005, Environmental Management on Construction Sites
S8.5	Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre at Tsing Yi.	All area/ During construction	Contractor(s)		✓		Implemented	Chapters 2 & 3 Code of Practice on the Packaging, Labelling & Storage of Chemical Wastes published under the Waste Disposal Ordinance (Cap 354),
S8.5	Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	Land site/ During construction	Contractor(s)		✓		Implemented	Waste Disposal Ordinance (Cap 354)
S8.5	A recording system for the amount of waste generated/ recycled and disposal sites. The trip- ticket system will be included as one of the contractual requirements and implemented by the contractor(s).	Land site/ During construction	Contractor(s)		✓		Implemented	DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction &
S8.5	Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of material and their proper disposal.	Land site/ During construction/ During operation	Contractor(s)		✓		Implemented	WBTC 32/92, The Use of Tropical Hard Wood on Construction Site

EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
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S8.5	Encourage collection of aluminium cans and wastepaper by individual collectors during construction with separate labelled bins provided to segregate these wastes from other general refuse by the workforce.	Land site/ During construction	Contractor(s)		✓		Implemented	ETWB TCW No. 33/2002, Management of Construction and
S8.5	Any unused chemicals and those with remaining functional capacity will be recycled as far as possible.	Land site/ During construction	Contractor(s)		✓		N/A	-
S8.5	Use of reusable non-timber formwork to reduce the amount of C&D materials.	All areas/ During construction	Contractor(s)		✓		Implemented	WBTC 32/92, The Use of Tropical Hard Wood on Construction Site
S8.5	Prior to disposal of construction waste, 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 of to landfill.	All areas/ During construction	Contractor(s)		✓		Implemented	DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials
S8.5	Proper storage and site practices to reduce the potential for damage or contamination of construction materials.	All areas/ During construction	Contractor(s)		✓		Implemented	-
S8.5	Plan and stock construction materials carefully to reduce amount of waste generated and avoid unnecessary generation of waste.	All areas/ During construction	Contractor(s)		✓		Implemented	-
S8.5	A Sediment Quality Report (SQR) for sampling and chemical testing of the sediment will be prepared and submitted to the EPD for approval. The approved detailed sampling and chemical testing will be carried out prior to the commencement of the dredging activities to confirm the sediment disposal method.	Marine works/ During construction	Contractor(s)		✓		N/A	ETWB TC(W) No. 34/2002 and Dumping at Sea Ordinance (DASO)
S8.5	The management of dredged/ excavated sediment management requirement from ETWB TC(W) No. 34/2002 will be incorporated in the Specification of the Contract Documents.	Marine works/ During construction	WSD/ Contractor(s)		✓		Implemented	ETWB TC(W) No. 34/2002 and Dumping at Sea Ordinance (DASO)
S8.5	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.	Contract mobilization/ During construction	Contractor(s)		✓		Implemented	Cap 354N Waste Disposal (Charges for Disposal of Construction Waste) Regulation
S8.5	A trip-ticket system will be established in accordance with DEVB TC(W) No. 6/2010 to monitor the reuse of surplus excavated materials off-site and disposal of construction waste and general refuse at transfer facilities/ landfills, and to control fly-tipping.	Contract mobilization/ During construction	Contractor(s)		✓		Implemented	DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials



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S8.5	The project proponent will also conduct regular inspection of the waste management measures implemented on site as described in the Waste Management Plan.	All area/ During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		Implemented	ETWB TC(W) No. 19/2005, Environmental Management on Construction Sites
S8.5	A recording system (similar to summary table as shown in Annex 5 and Annex 6 of Appendix G of ETWB TC(W) No. 19/2005) for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established during the construction phase.	All area/ During construction	Contractor(s)		✓		Implemented	Annex 5 and Annex 6 of Appendix G of ETWB TC(W) No. 19/2005
S8.5	Inert C&D materials (public fill) will be reused within the Project as far as practicable.	All area/ During construction	Contractor(s)		✓		Implemented	-
S8.5	Public fill and construction waste shall be segregated and stored in different containers or skips to facilitate reuse or recycling of materials and their proper disposal.	All area/ During construction	Contractor(s)		✓		Implemented	-
S8.5	Specific areas of the work site will be designated for such segregation and storage if immediate use is not practicable.	All area/ During construction	Contractor(s)		✓		Implemented	-
S8.5	To reduce the potential dust and water quality impacts of site formation works, C&D materials will be wetted as quickly as possible to the extent practice after filling.	All area/ During construction	Contractor(s)		✓		Implemented	Air Pollution Control (Construction Dust) Regulation (Cap 311R); WPCO (Cap 358)
S8.5	Open stockpiles of excavated/ fill materials or construction wastes on-site should be covered with tarpaulin or similar fabric.	Land site/ During Construction, particularly dry season	Contractor(s)		✓		Implemented	Air Pollution Control (Construction Dust) Regulation (Cap 311R)
S8.5	Chemical waste container shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Handling and Storage of Chemical Wastes
S8.5	Chemical waste container shall have a capacity of less than 450 L unless the specifications have been approved by the EPD.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	
S8.5	A label in English and Chinese shall be displayed on the chemical container in accordance with instructions prescribed in Schedule 2 of the Regulations.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	

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S8.5	Storage areas for chemical waste shall be enclosed on at least 3 sides.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	
S8.5	Storage areas for chemical waste shall 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.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	
S8.5	Storage areas for chemical waste shall have adequate ventilation.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	
S8.5	Storage areas for chemical waste shall be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary).	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	
S8.5	Storage areas for chemical waste shall be arranged so that incompatible materials are appropriately separated.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	
S8.5	General refuse will be stored in enclosed bins or compaction units separately from construction and chemical wastes.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented after reminder	
S8.5	Adequate number of waste containers will be provided to avoid over-spillage of waste.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	DEVB TC(W) No. 8/2010 Enhanced Specification for Site Cleanliness and Tidiness.
S8.5	A reputable waste collector will be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimise odour, pest and litter impacts.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented after reminder	-
S8.5	Recycling bins will be provided at strategic locations within the Site to facilitate recovery of recyclable materials (including aluminum can, waste paper, glass bottles and plastic bottles) from the Site. Materials recovered will be sold for recycling.	All area/ During construction/ During operation	Contractor(s)/ WSD		✓	✓	Implemented	-
S8.5	To avoid any odour and litter impact, accurate number of portable toilets will be provided for workers on-site.	All area/ During construction	Contractor(s)		✓		Implemented	-
S8.5	The burning of refuse on construction sites is prohibited by law.	All area/ During construction	Contractor(s)		✓		Implemented	Air Pollution Control Ordinance (Cap 311)

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S8.7	To facilitate monitoring and control over the contractors' performance on waste management, a waste inspection and audit programme will be implemented throughout the construction phase.	All facilities/ During construction	ET/ IEC		✓		Implemented	-
<b>Ecology</b>								
S9.7	For slope mitigation works within the Clear Water Bay Country Park, to avoid tree felling and damages to trees, the exact locations of the flexible barrier foundation plates, soil nails and rock dowels can be adjusted during detailed design, and a setback distance from existing trees is recommended to be maintained as far as practical. A detailed specification describing the exact locations of the flexible barrier foundation plates, soil nails and rock dowels will be prepared to illustrate how the setback distance from existing trees would be implemented for tree avoidance.	Slope mitigation works area/ During detailed design/ During construction	Contractor(s)	✓	✓		Implemented	-
S9.7	Pruning of tree canopies along the alignment of the flexible barriers shall be limited to a minimum.	Slope mitigation works area/ During construction	Contractor(s)		✓		Implemented	-
S9.7	The alignment of flexible barriers shall be optimized to preserve all species of conservation interest and minimize the impact to the existing vegetation as far as practicable. All individuals of Marsdenia lachnostoma within the slope mitigation areas shall be retained in- situ, by positioning the alignment of flexible barrier at a minimum 1.5m in a radius away from these individuals.	Slope mitigation works area/ During detailed design/ During construction	Contractor(s)	✓	✓		Implemented	-
S9.7 and 9.10	At the detailed design stage prior to the commencement of the slope mitigation works, a vegetation survey shall be carried out at the slope mitigation areas within the Clear Water Bay Country Park to assess the condition and identify the location of each individual of Marsdenia lachnostoma and other flora species of conservation interest that may be directly affected by the construction works.	Slope mitigation works area/ During detailed design/ During construction	Contractor(s)	✓			Implemented	-
S9.7	Temporary fencing will be installed to fence off the concerned species either in groups of individually within the works area and in the close proximity to prevent from being damaged and disturbed during construction. A sign identifying the site shall be attached to the fence and flagging tape shall be attached to the individuals to visualize their locations.	Slope mitigation works area/ During construction	Contractor(s)		✓		Implemented	-

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S9.7 and S9.10	A specification for fencing and demarcating individuals of Marsdenai lachnostoma (or other flora species of conservation interest, if found) adjacent to the proposed alignment of the flexible barriers will be prepared to protect the species.	Slope mitigation works area/ During construction	Contractor(s)		✓		Implemented	-
S9.7	Induction training shall also be provided to all site personnel in order to brief them on this flora of conservation interest including the locations and their importance.	Slope mitigation works area/ During construction	Contractor(s)		✓		Implemented	-
S9.7	The resident site supervisory staff will closely monitor the conditions of concerned individuals during construction of flexible barriers in the close proximity.	Slope mitigation works area/ During construction	Contractor(s)		✓		Implemented	-
S9.7	Erect fences along the boundary of the works area before the commencement of works to prevent vehicle movements and encroachment of personnel onto adjacent areas.	All area/ During construction	Contractor(s)		✓		Implemented	-
S9.7	Regularly check the work site boundaries to ensure that they are not breached and that damage does not occur to surrounding areas.	All area/ During construction	Contractor(s)/ ET		✓		Implemented after reminder	-
S9.7	Avoid any damage and disturbance, particularly those caused by filling and illegal dumping, to the surrounding habitats through proper management of waste disposal.	All area/ During construction	Contractor(s)		✓		Implemented	-
S9.7	Reinstate temporarily affected areas, particularly the habitats of plantation and shrubland-grassland immediately after completion of construction works, through on-site tree/shrub planting. The tree/shrub species will be chosen with reference to those in the surrounding area.	All area/ During construction	Contractor(s)		✓		To be Implemented	-
S9.7	Affected habitats within the Clear Water Bay Country Bay shall be reinstated by hydro-seeding and planting of climbers and native shrub seedlings where practical upon completion of the slope mitigation works.	All area/ During construction	Contractor(s)		✓		To be Implemented	-
<b>Landscape &amp; Visual</b>								
S11.10 & 11.11	The construction area and area allowed for temporary structures, such as the contractor's office, will be minimized to a practical minimum. (MM1)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented	-
S11.10 & 11.11	At the detailed design stage, the design team will seek to minimize the landscape footprint of the Project and above ground facilities, while satisfying all other requirements. (MM2)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented	-

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S11.10 & 11.11	Design principles will be adopted to take into account the surrounding area, particularly Clear Water Bay Country Park behind and the nearby waterfront, with due consideration given to: - green roofs where practical (i.e. without equipment on the roof); - roadside planting; - aesthetic treatment of all structures; - vertical greening; - screen planting along application site; and - landscape enhancement with amenity planting where practical including planting along the edge (site boundary) fence with native shrubs where feasible, to reduce their visual impact and blend them into the surrounding landscape. (MM3)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented	--
S11.10 & 11.11	All trees within the Project Site or the potential slope mitigation works area will be carefully protected during construction according to DEVB TCW No. 10/2013 - Tree Preservation (MM4)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented after reminder	ETWB TCW No. 3/2006 - Tree Preservation.
S11.10 & 11.11	No tree within the Country Park will be felled. Trees within the Site unavoidably affected by the works will be transplanted where necessary and practical. For trees that need to be felled, compensatory planting will be provided to the satisfaction of relevant Government departments. A compensatory tree planting proposal including locations of tree compensation will be submitted to seek relevant government department's approval, in accordance with DEVB TC(W) No. 10/2013. (MM5)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented	DEVB TC(W) No. 10/2013
S11.10 & 11.11	Any slope mitigation works necessary to address natural terrain hazards, will be minimized to minimize any potential environmental impact to the Country Park e.g. soil nailing and rock stabilization will aim to avoid existing trees e.g. should any restoration of vegetation be necessary, the best planting matrix with native species will be established, with the aim of resembling the existing vegetation. (MM6)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	N/A	-

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S11.10 & 11.11	Dredging works for the installation of intake structures and outfall diffusers should be minimized to avoid or reduce any potential environmental impacts to as low as reasonably practicable (ALARP). The intake and outfall structures (e.g. intake openings and diffuser heads) will be prefabricated and transferred to site for installation. (MM7)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented	-
S11.10 & 11.11	All night-time lighting will be reduced to a practical minimum both in terms of number of level and will be hooded and directional. (MM8) units and lux level and will be hooded and directional. (MM8)	All area/ Detailed design/ During construction/ During operation	WSD/ Contractor(s)	✓	✓	✓	Implemented	-
<b>Landfill Gas Hazard</b>								
S12.7	During all works, safety procedures should be implemented to minimise the risks of fires and explosions, asphyxiation of workers and toxicity effects resulting from contact with contaminated soil and groundwater.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	During trenching and excavation as well as creation of confined spaces at near to or below ground level, precautions should be clearly laid down and rigidly Gas detection equipment and appropriate breathing apparatus should be available and used when entering confined spaces or trenches deeper than 1 meter.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	The Contractor should make the workers are aware of potential hazards of working in confined spaces (any chamber, manhole or culvert which is large enough to permit access to personnel). Such work in confined spaces is controlled by the Factories and Industrial Undertakings (Confined Spaces) Regulations of the Factories and Industrial Undertakings Ordinance. Following the Safety Guide to Working in Confined Spaces ensures compliance with the above regulations.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	Safety officers, specifically trained with regard to landfill gas and leachate related hazards and the appropriate actions to take in adverse circumstances, should be present on the site throughout the works, in particular, when works are undertaken below grade.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	All personnel who work on site and all visitors to the site should be made aware of the possibility of ignition of gas in the vicinity of the works, the possible presence of contaminated water and the need to avoid physical contact with it.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-



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S12.7	Monitoring for landfill gas should be undertaken in all excavations, manholes, chambers (particularly during pipe jacking) and any confined spaces through the use of an intrinsically safe portable instrument, appropriately calibrated and capable of measuring the concentrations of methane, carbon dioxide and oxygen.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	Monitoring frequency and areas to be monitored should be specified prior to commencement of groundwork, either by the Safety Officer, or by an appropriately qualified person. All measurements should be recorded and documented.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	Proceed drilling with adequate care and precautions against the potential hazards which may be encountered.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	Prior to the commencement of the site works, the drilling contractor should devise a 'method-of- working' statement covering all normal and emergency procedures (including but not limited to number of operatives, experience and special skills of operatives, normal method of operations, emergency procedures, supervisors responsibilities, storage and use of safety equipment, safety procedures and signs, barriers and guarding). The site supervisor and all operatives must be familiar with this statement.	All area/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	Where below ground service entries are necessary to the Incoming Switchgear Room, 132 kV Substation and Chlorine Store (I) and (II), the entry point should be sealed to prevent gas entry. In addition, any below grade cable trenches entering the Incoming Switchgear Room and 132 kV Substation can become the pathway for landfill gas and hence gridded metal covers should be used.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	N/A	-
S12.7	It is recommended regular landfill gas monitoring should be carried out at the Incoming Switchgear Room, 132 kV Substation and Chlorine Store (I) and (II). The monitoring frequency will be monthly for the first year of operation. If the monitoring results show no sign of landfill gas migration, reduce the monitoring frequency to once every six months.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	N/A	-

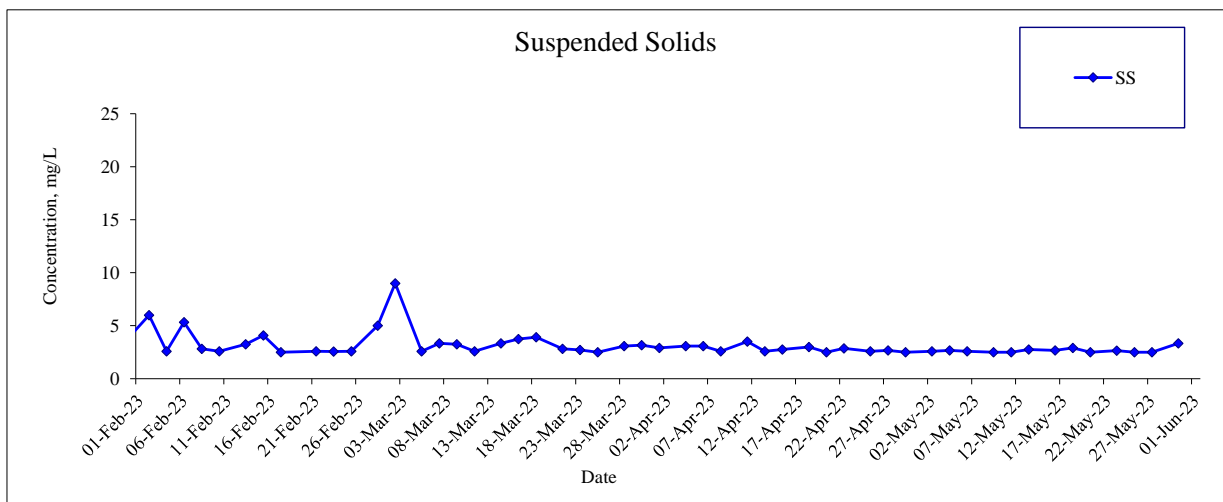
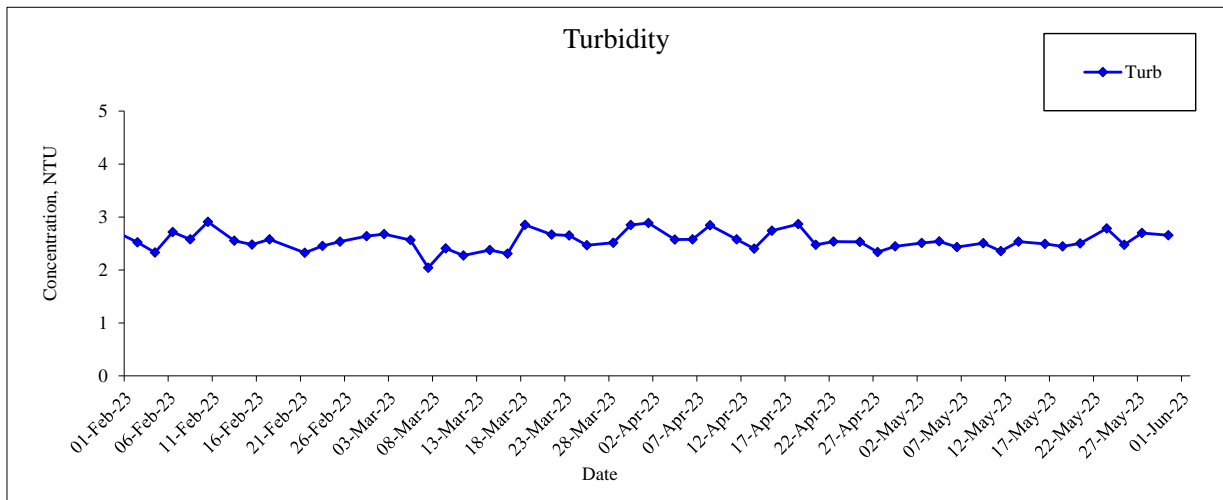
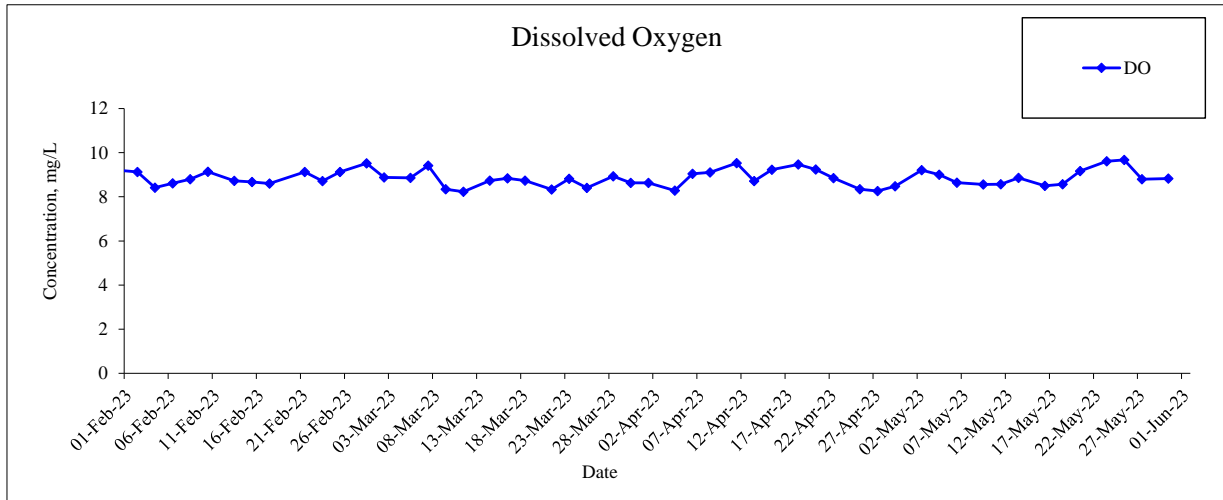
EIA Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Implementation Agent	Implementation Stage			Implementation status	Relevant Legislation & Guidelines
				D	C	O		
S12.7	The manholes and utility pits within the Project Site and along the freshwater mains. Each manhole/ utility pit should be monitored with two measurements (at mid depth and base). Each measurement should be monitored for a minimum of 10 minutes. A steady reading and peak reading should be recorded at each manhole/ utility pit and for each measurement. The need for venting the manhole/ utility pit and further monitoring will be reviewed after the initial monitoring.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-
S12.7	All construction, operation and maintenance personnel working on-site as well as visitors should be made aware of the hazards of landfill gas and its possible presence on-site. This should be achieved through a combination of posting warning signs in prominent places and also by access to detailed information on landfill gas hazards and the designs and procedural means by which these hazards are being minimized on-site.	All area/ Detailed design/ During construction/ During operation	Contractor(s)	✓	✓	✓	Implemented	-

Note: D – Design stage C – Construction O – Operation

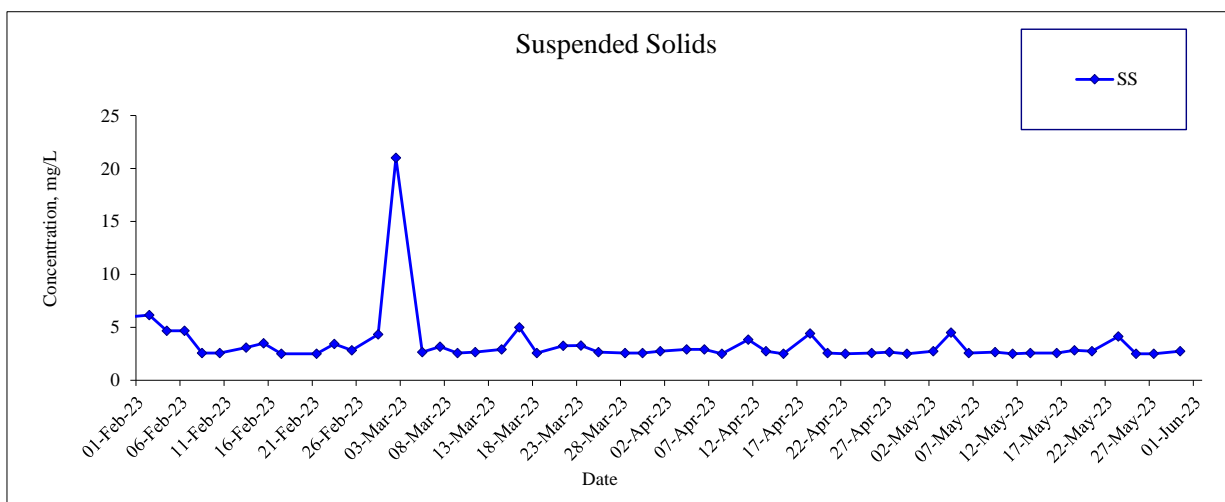
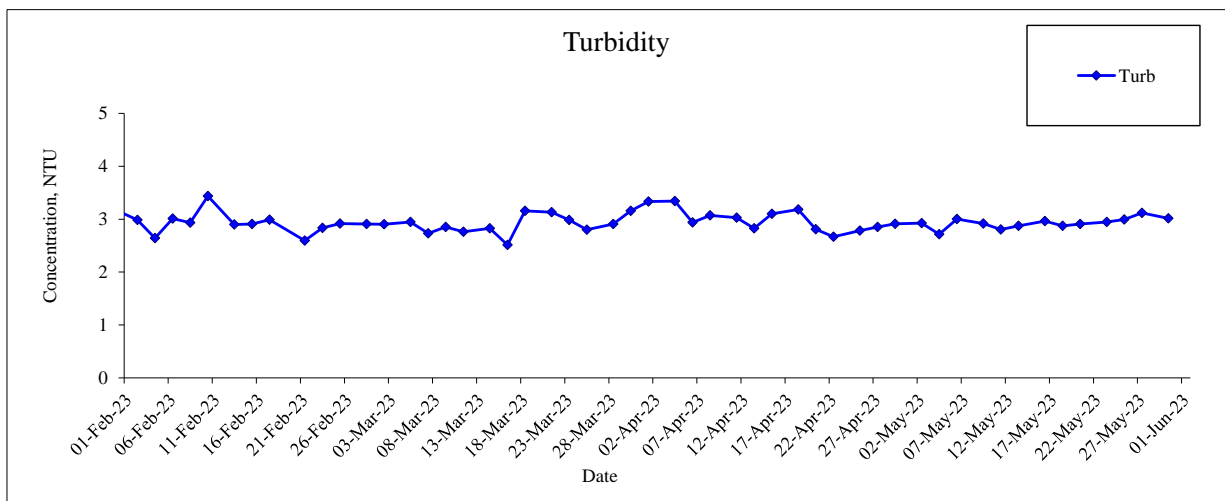
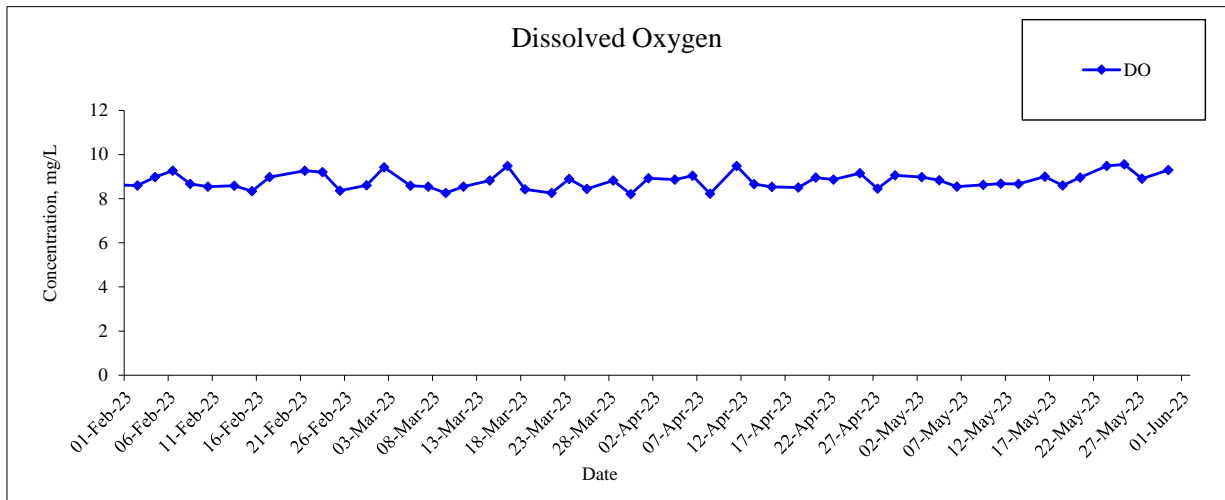
## Appendix D

# Water Quality Monitoring Graphical Presentation

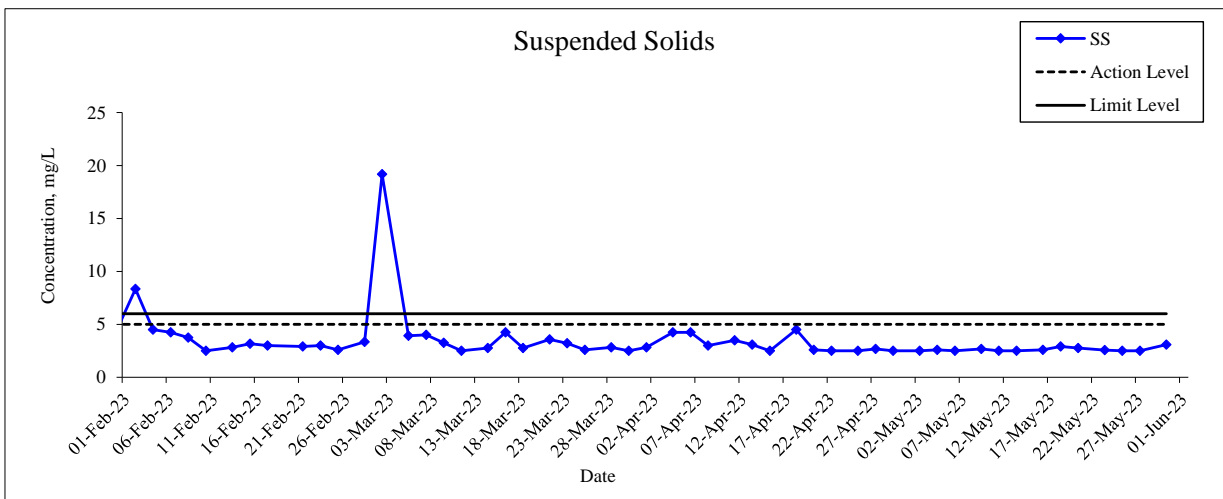
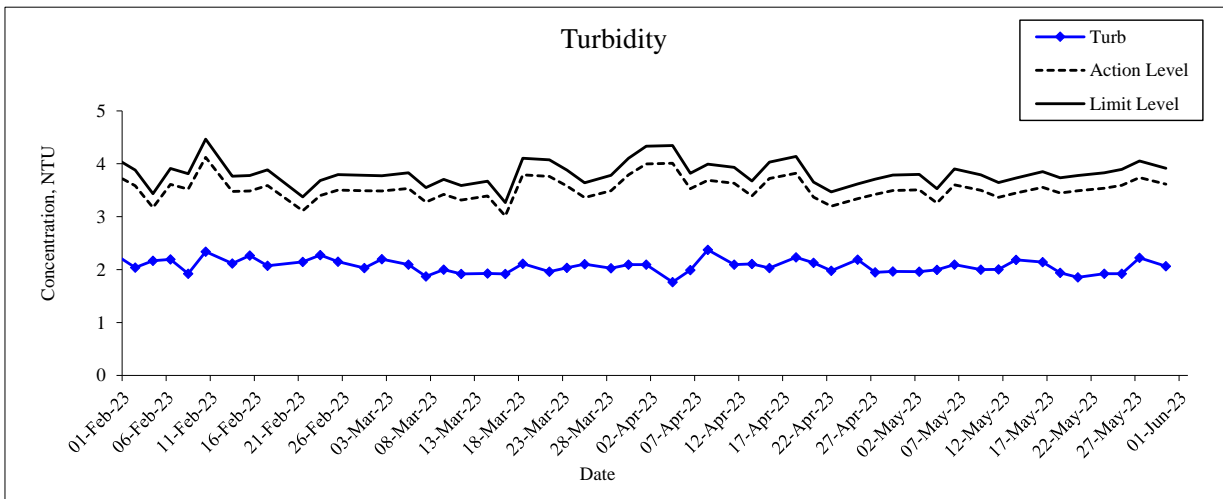
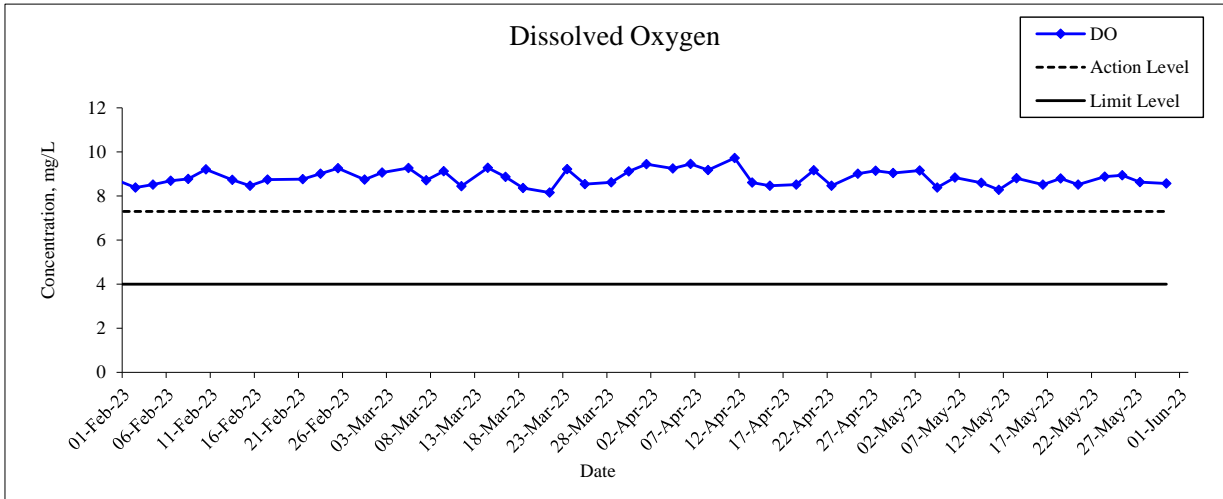
## Middle Flood Tide Monitoring Location: CE



### Monitoring Location: CF

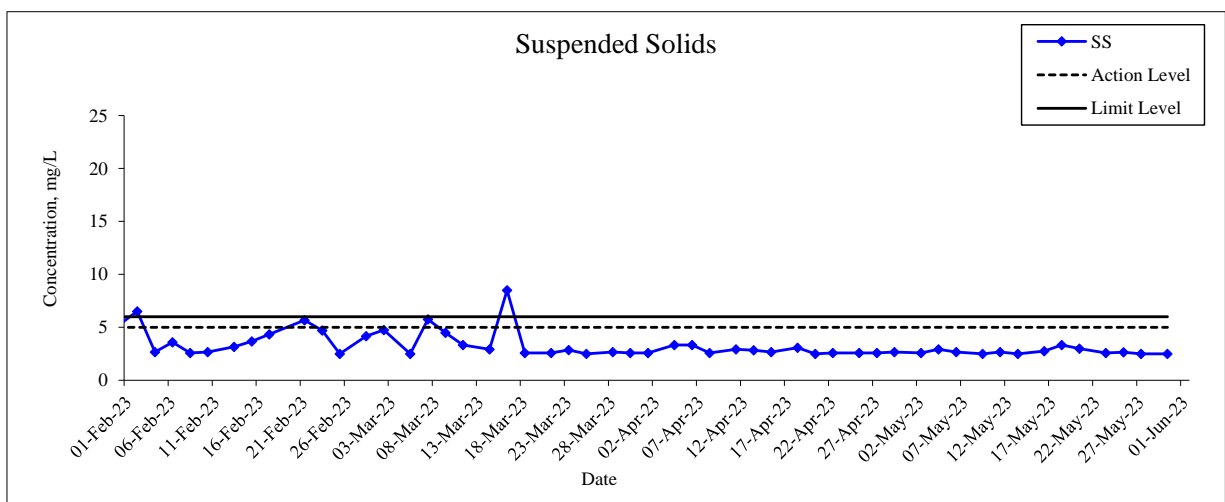
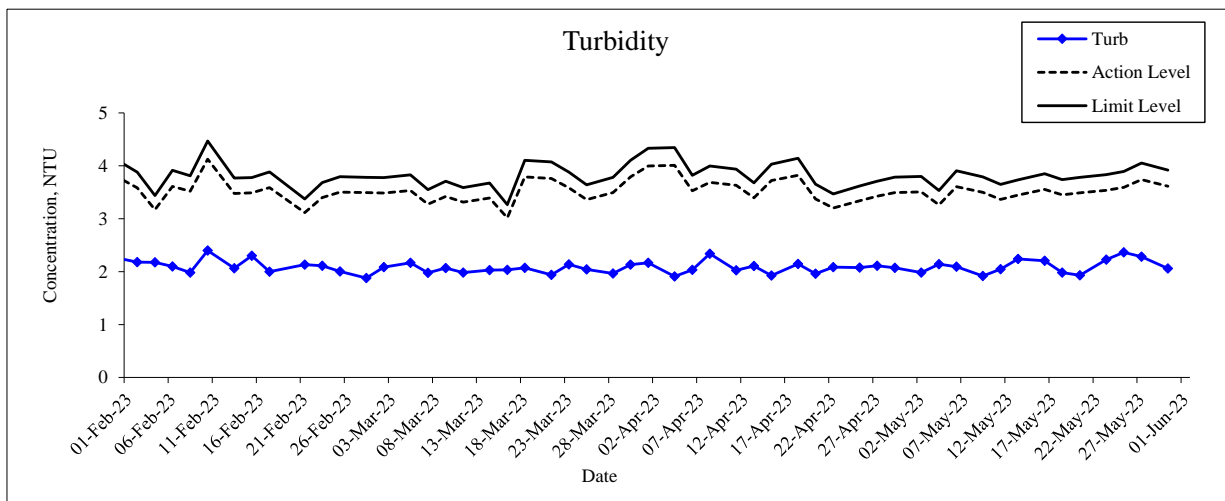
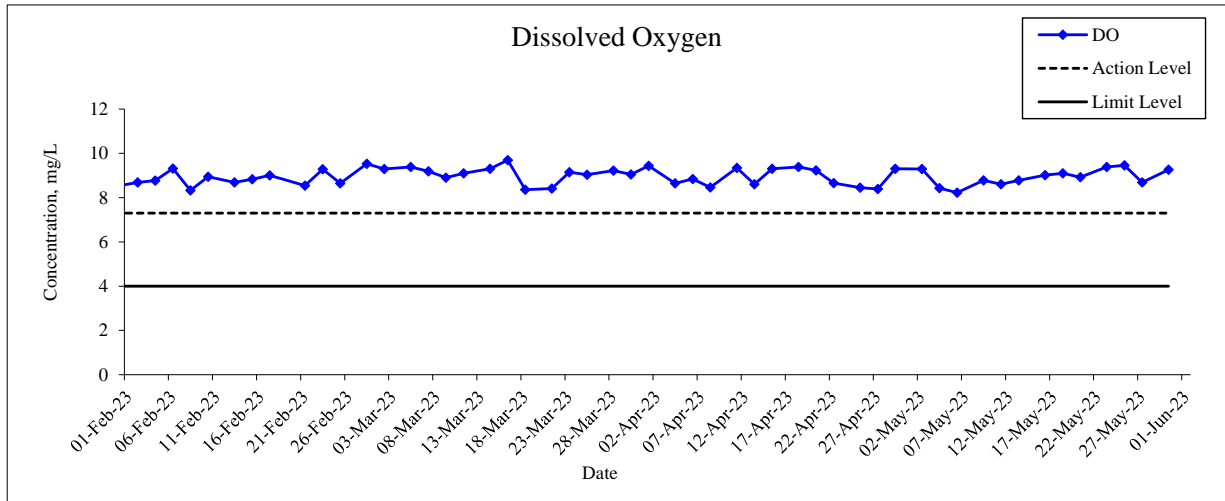


### Monitoring Location: WSR1

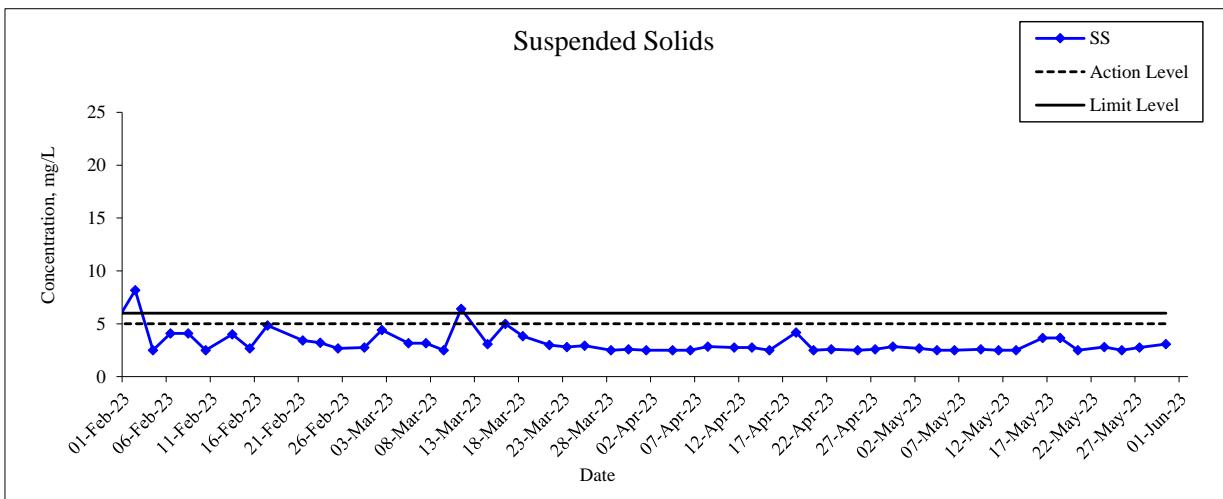
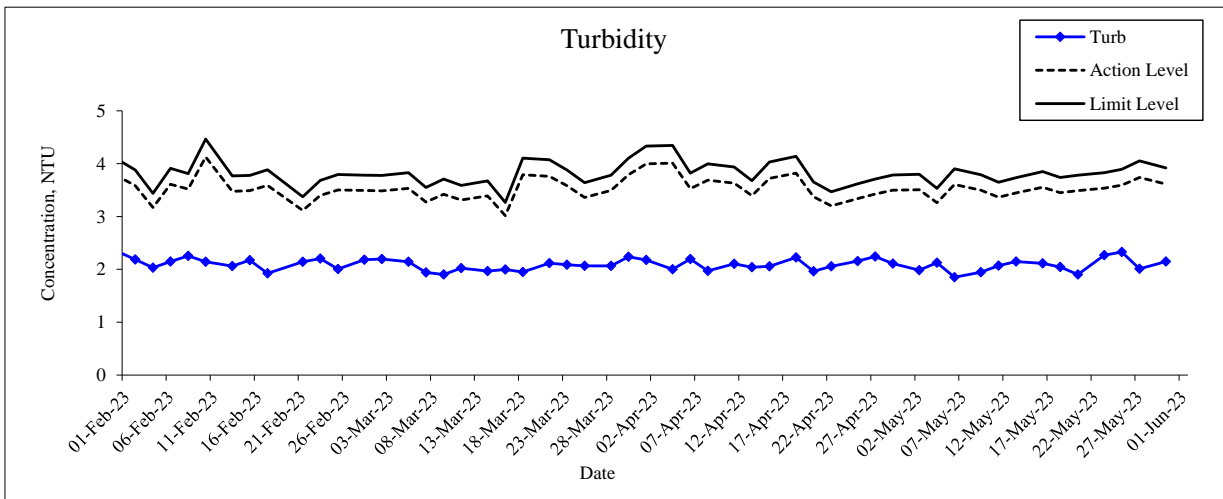
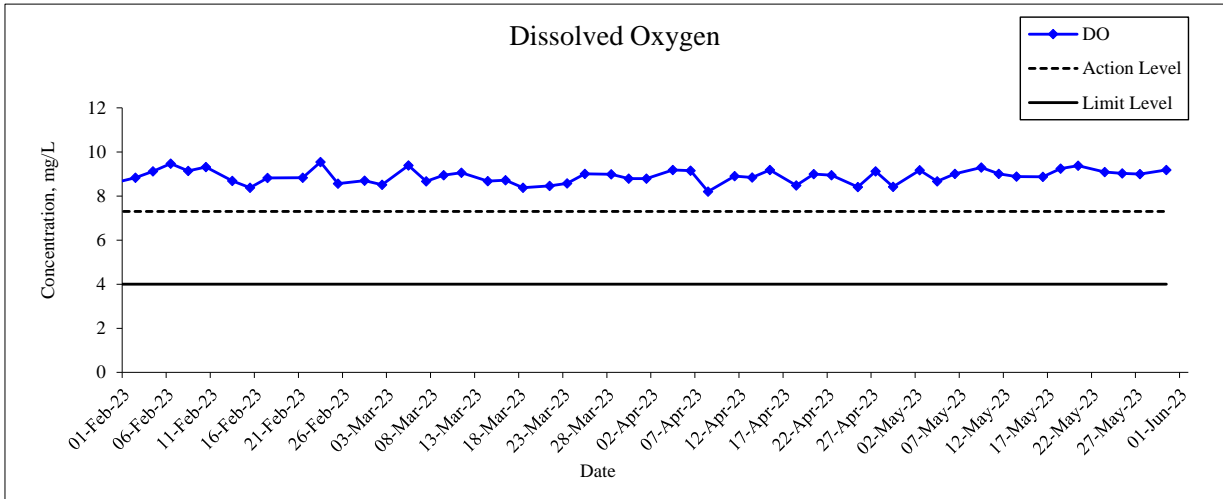




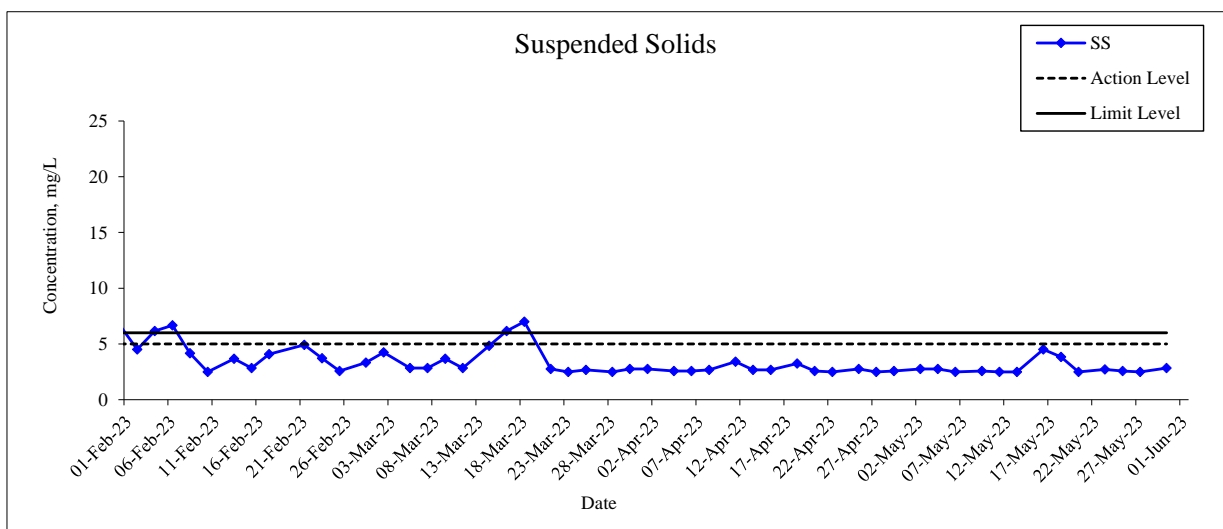
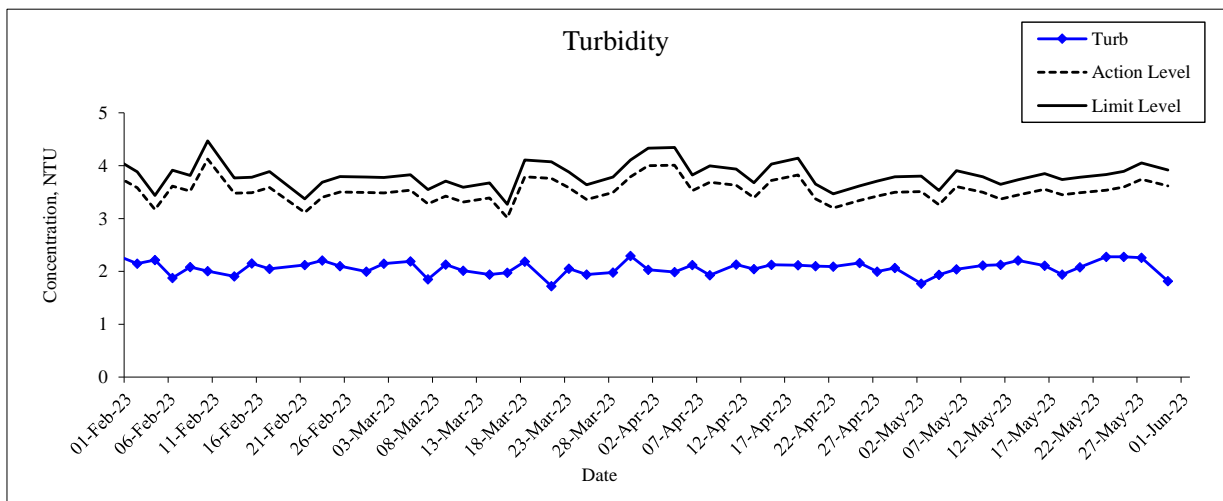
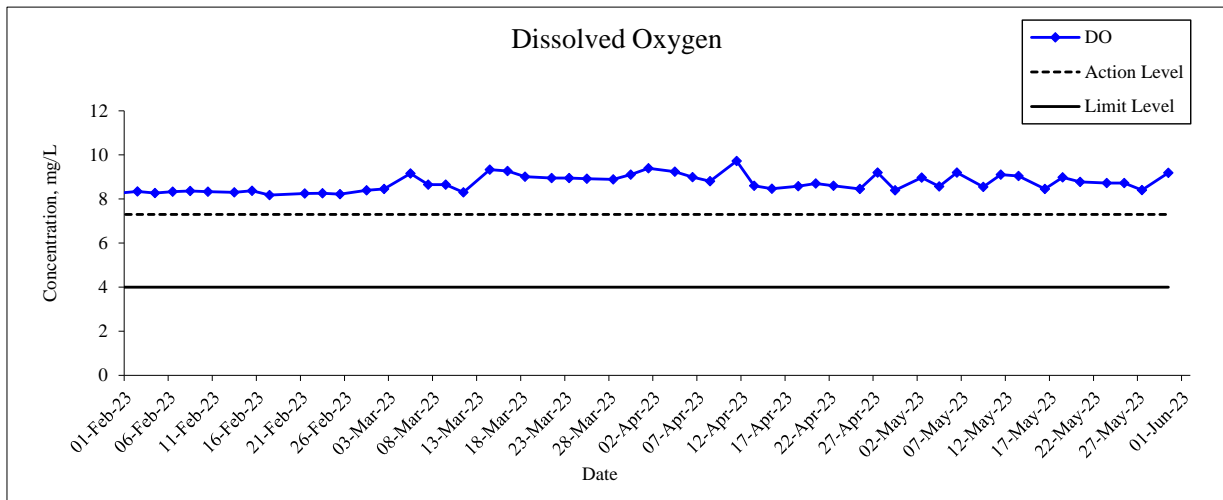
### Monitoring Location: WSR2



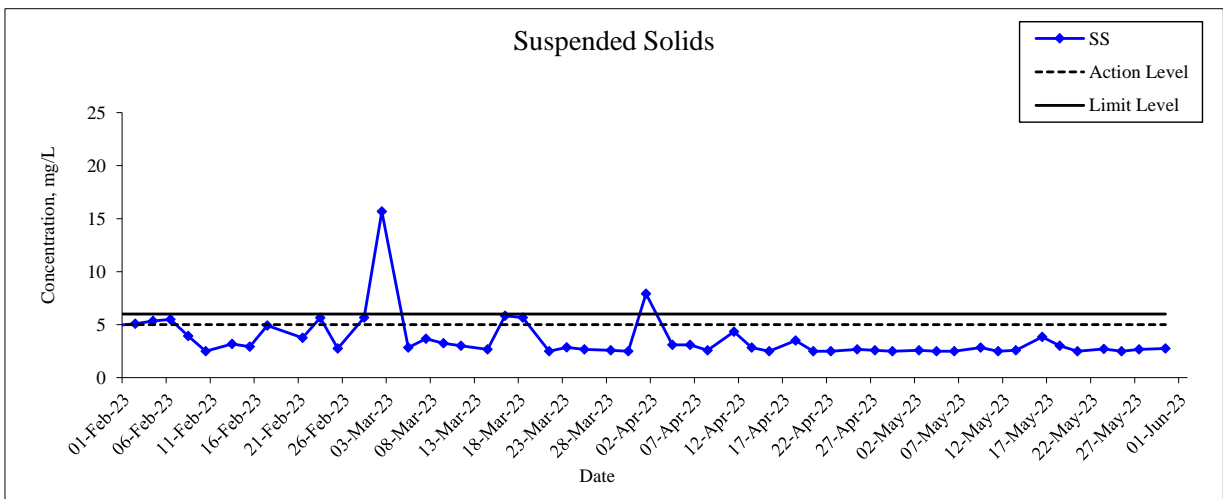
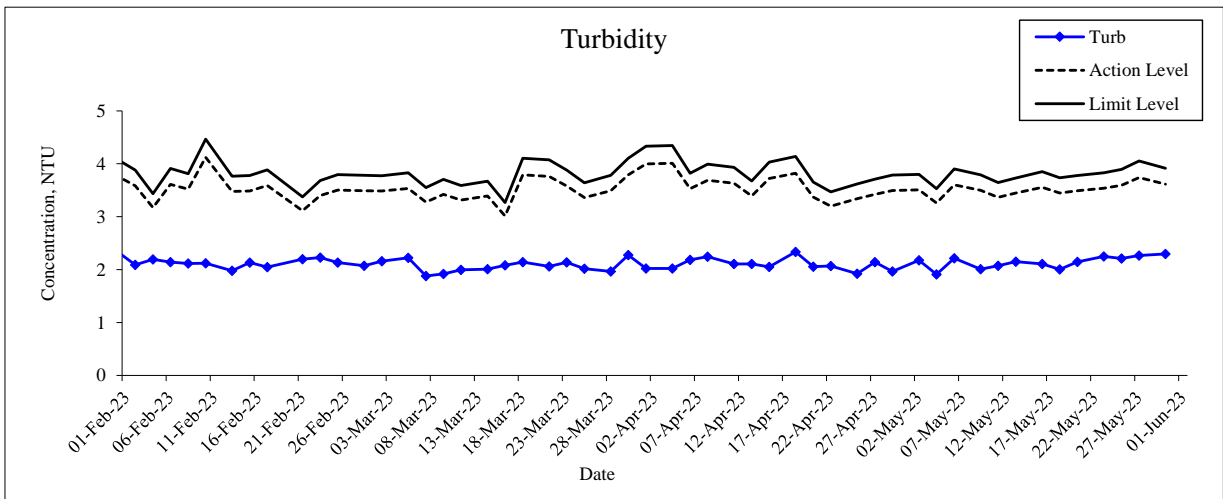
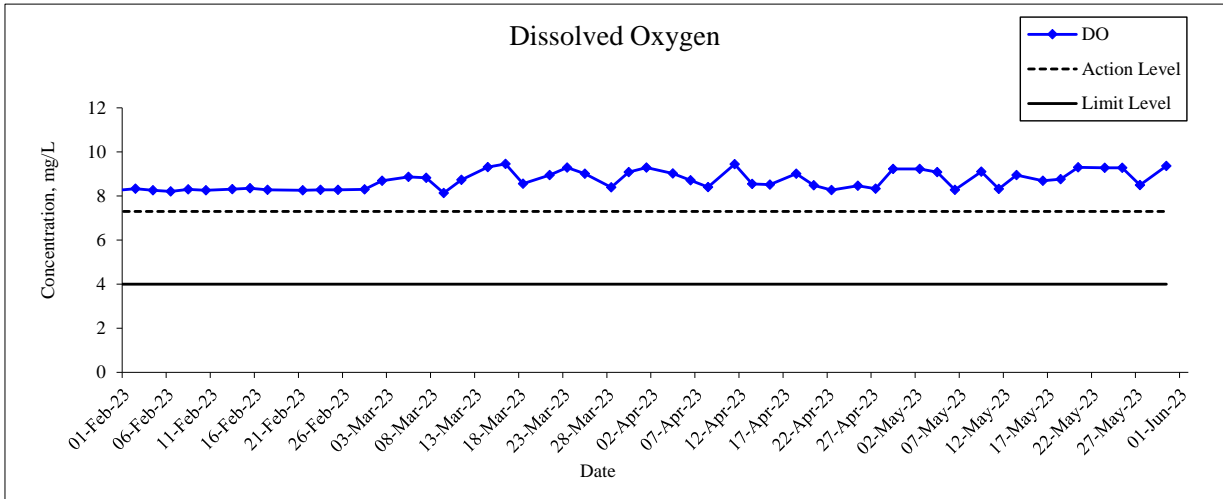
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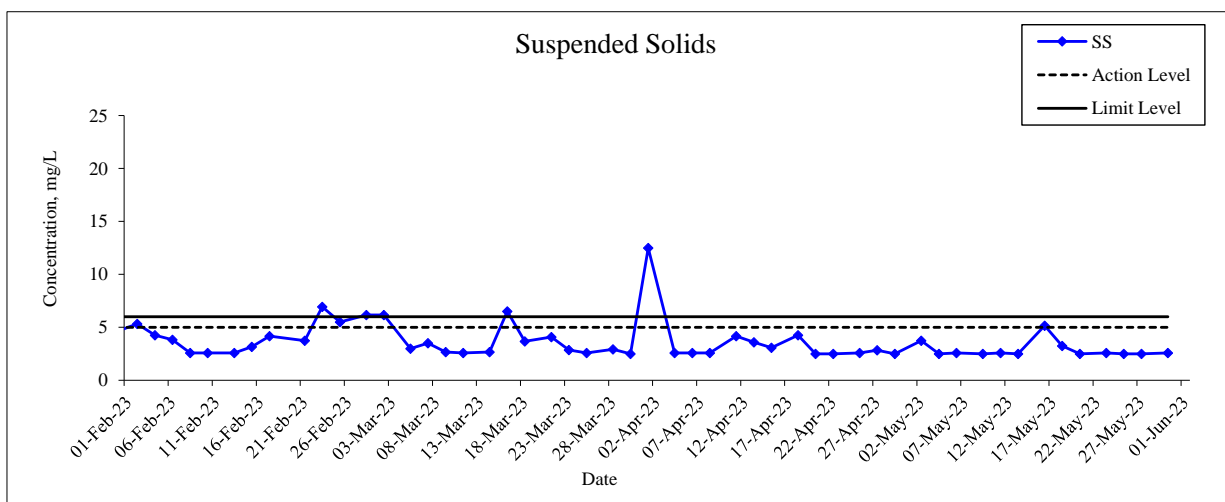
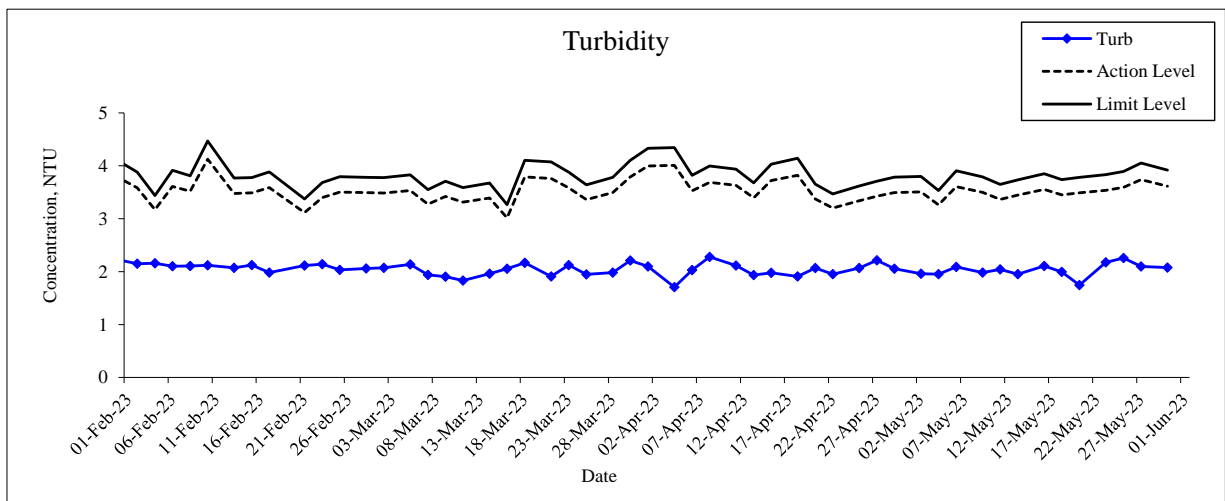
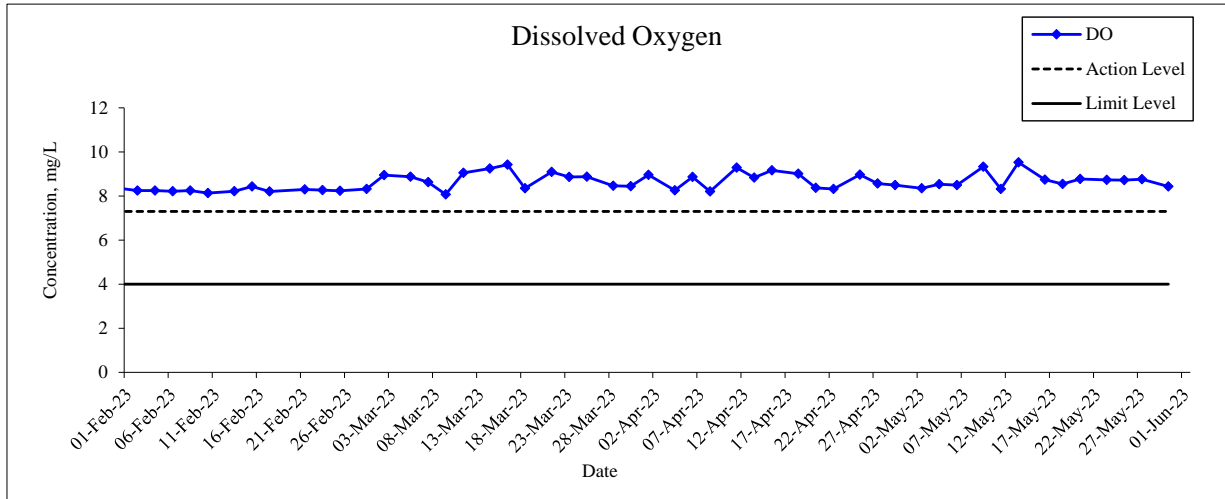
### Monitoring Location: WSR4



### Monitoring Location: WSR16

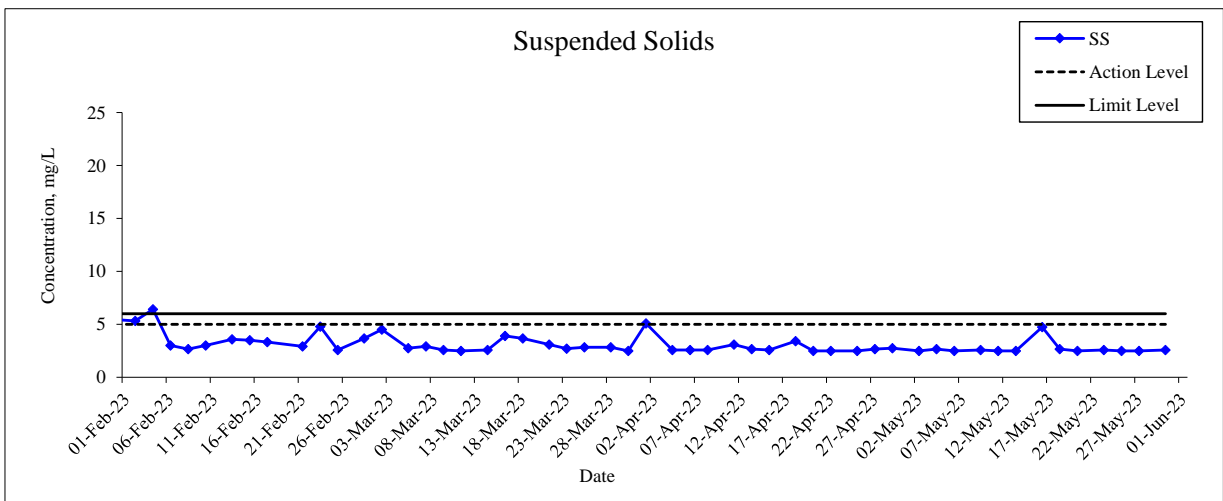
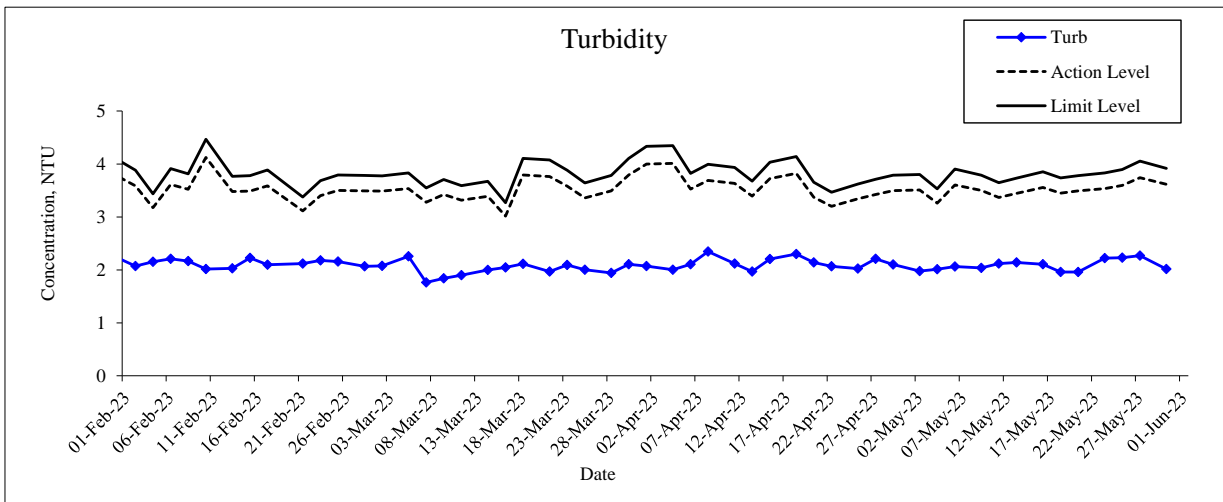
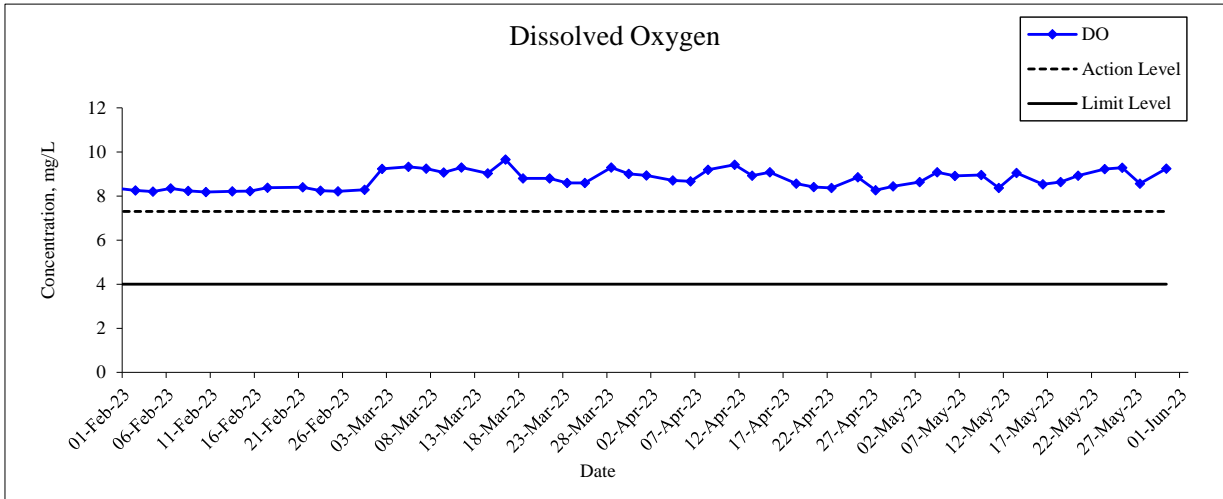


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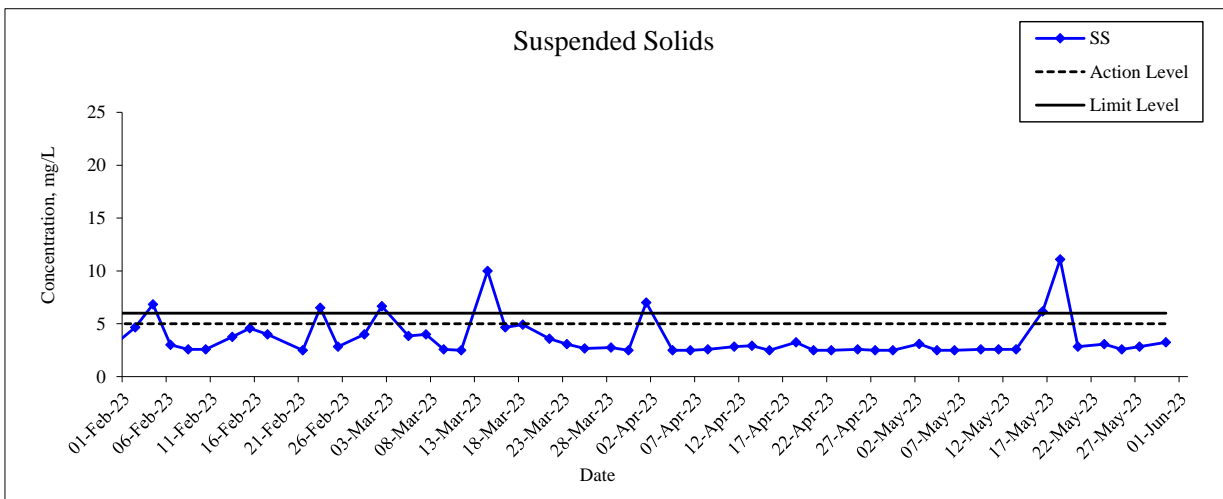
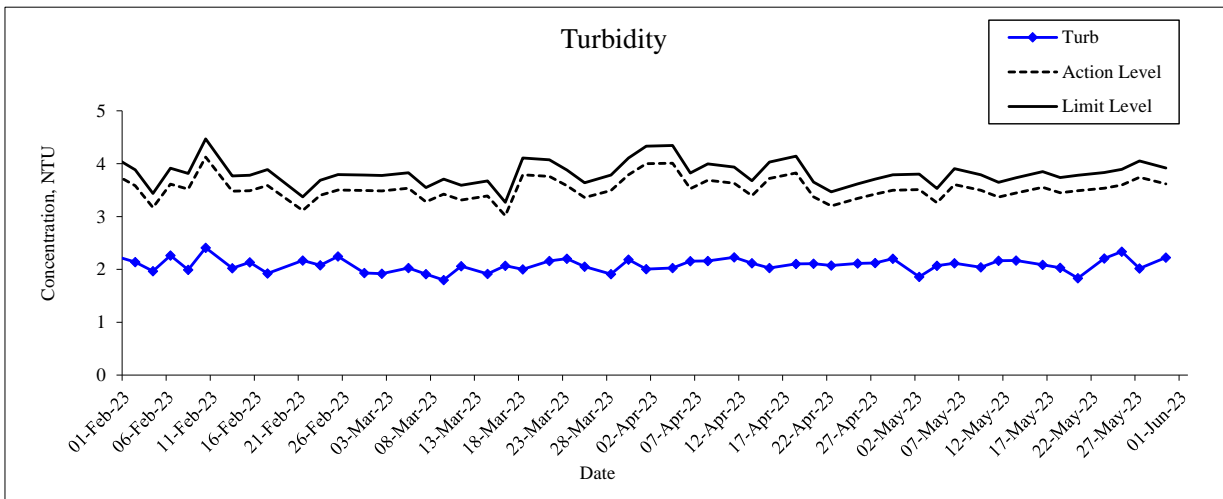
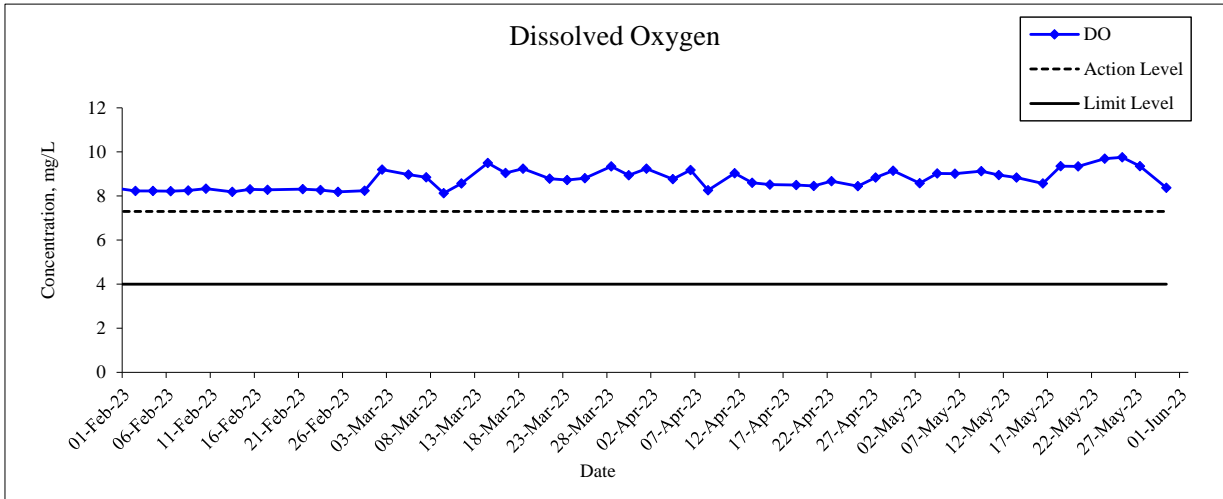




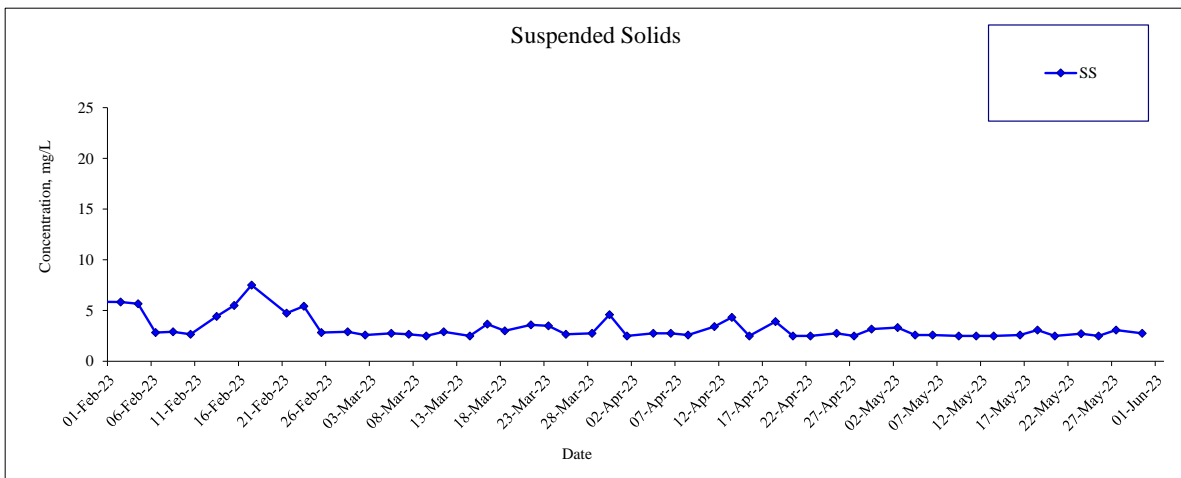
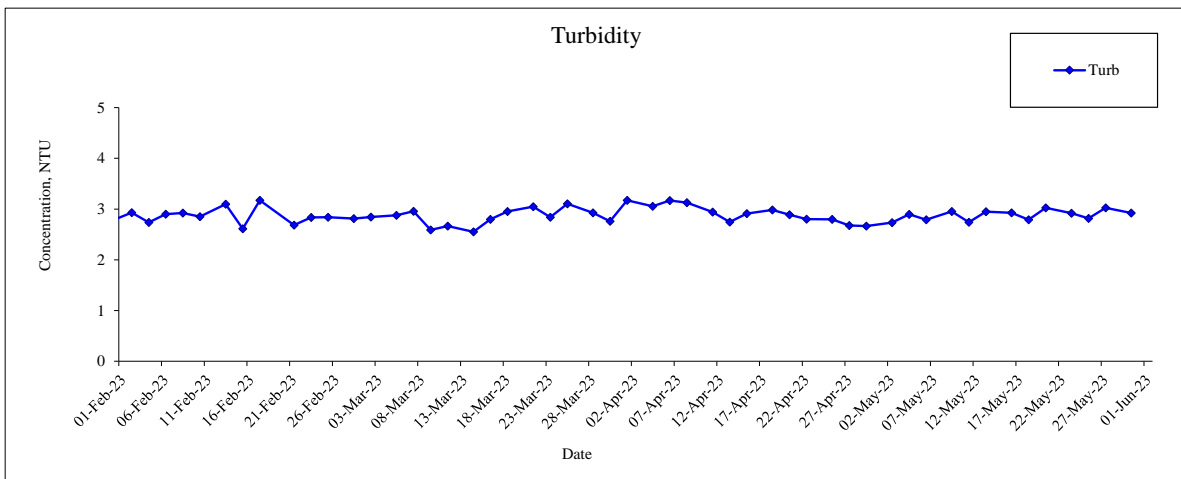
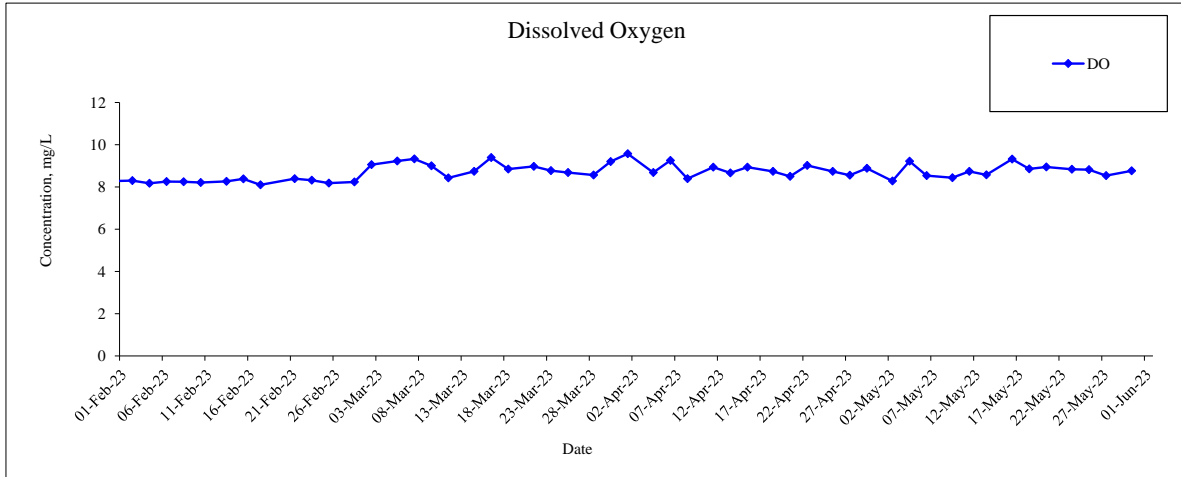
### Monitoring Location: WSR36



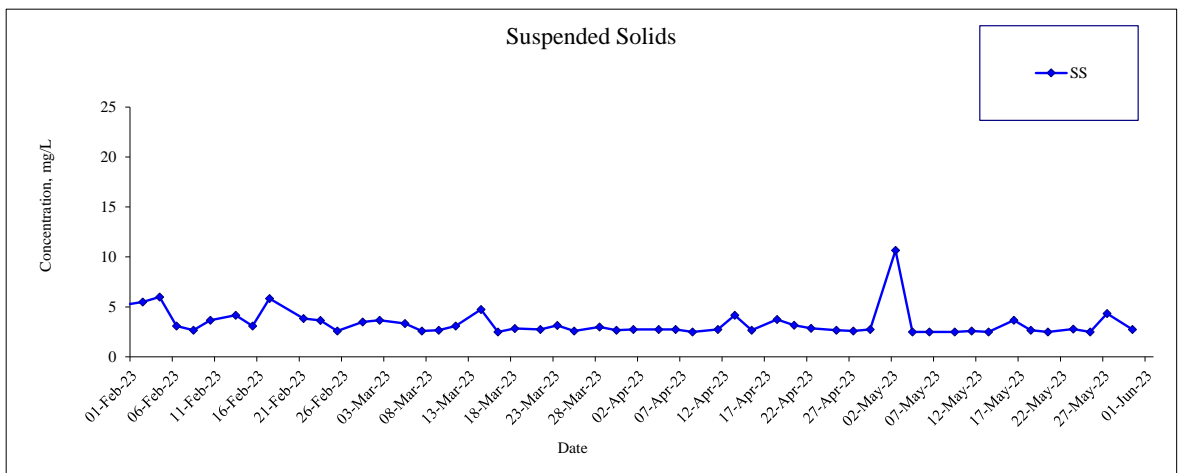
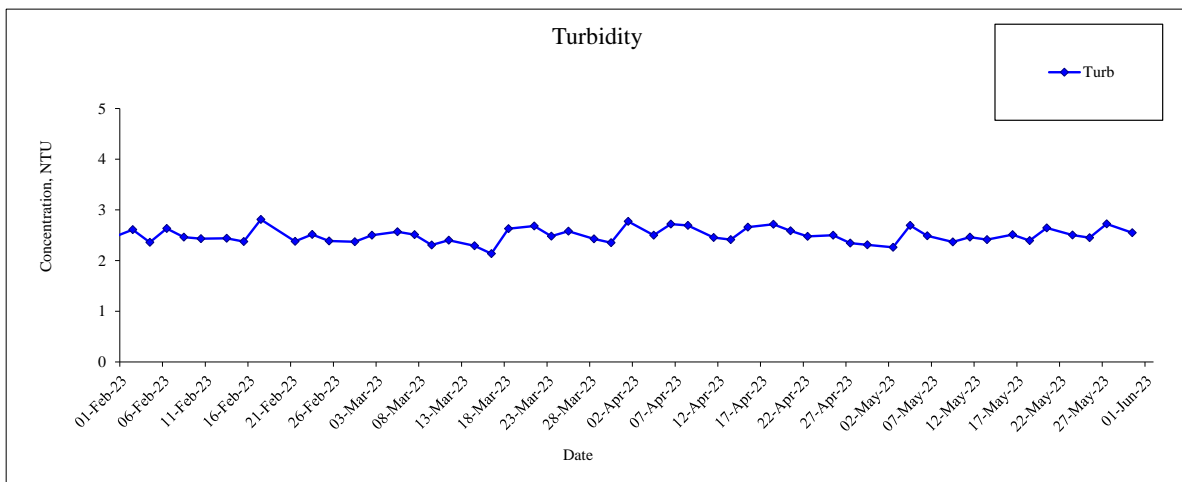
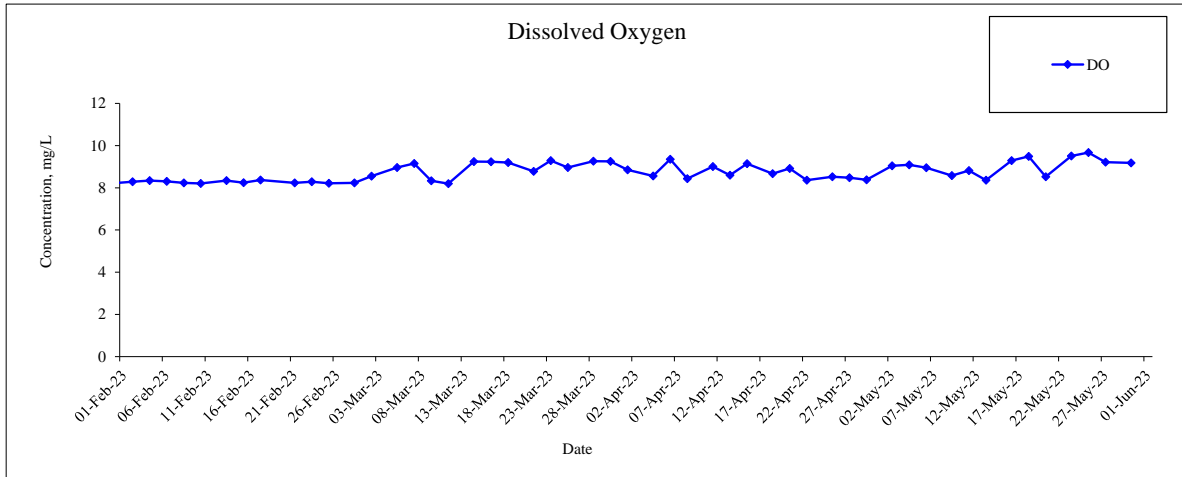
Monitoring Location: WSR37



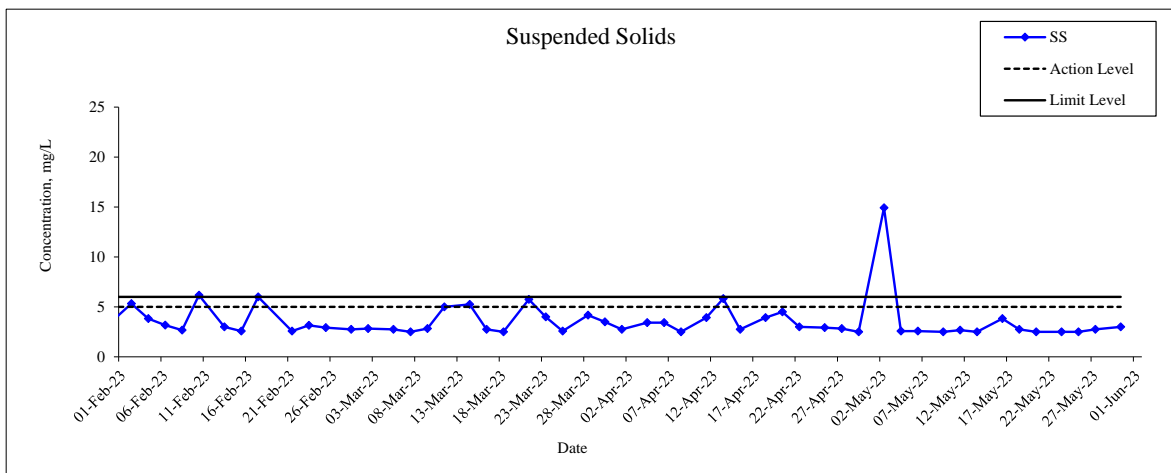
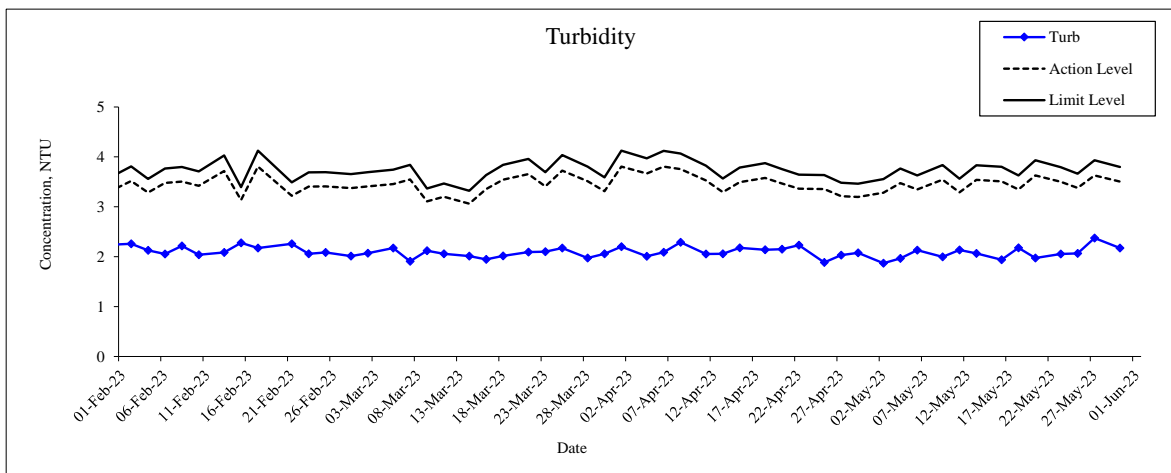
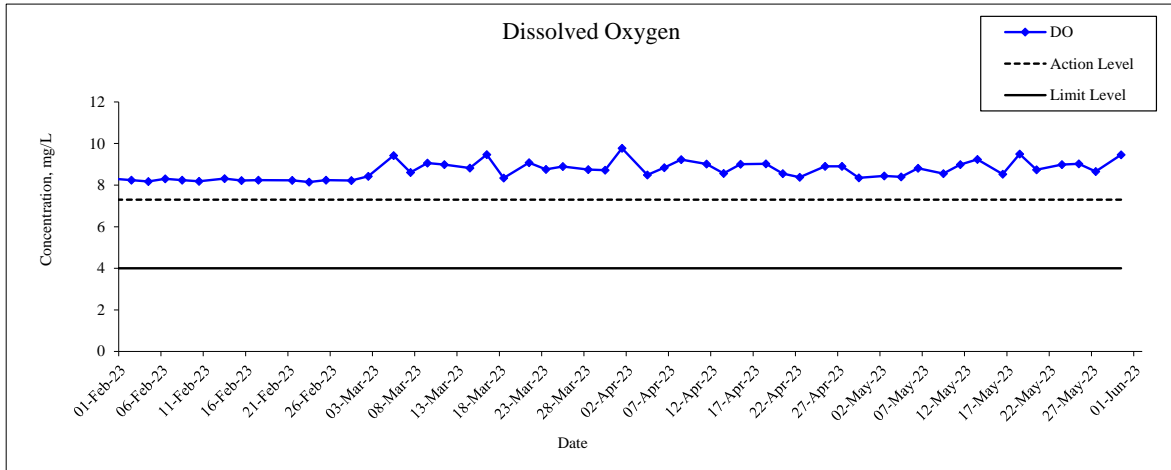
### Middle Ebb Tide Monitoring Location: CE



Monitoring Location: CF

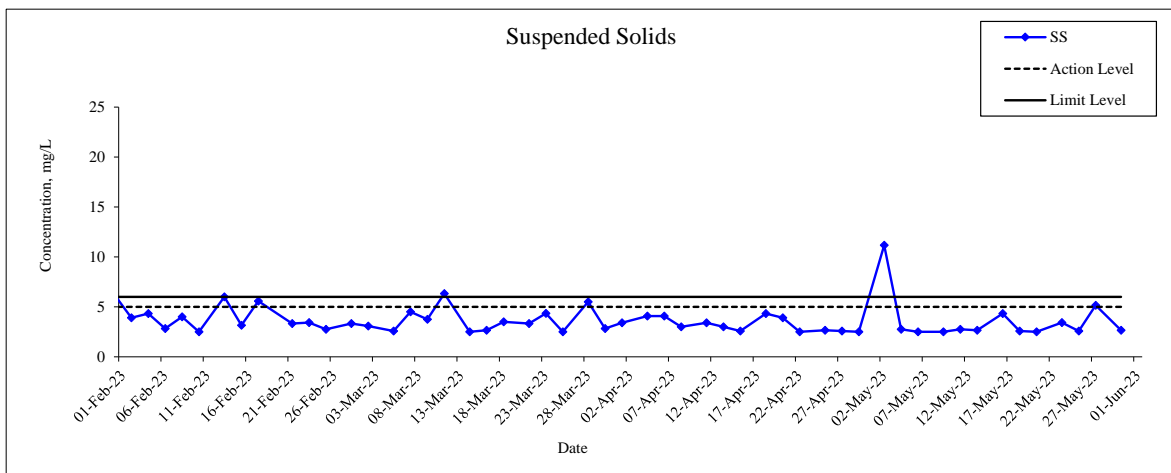
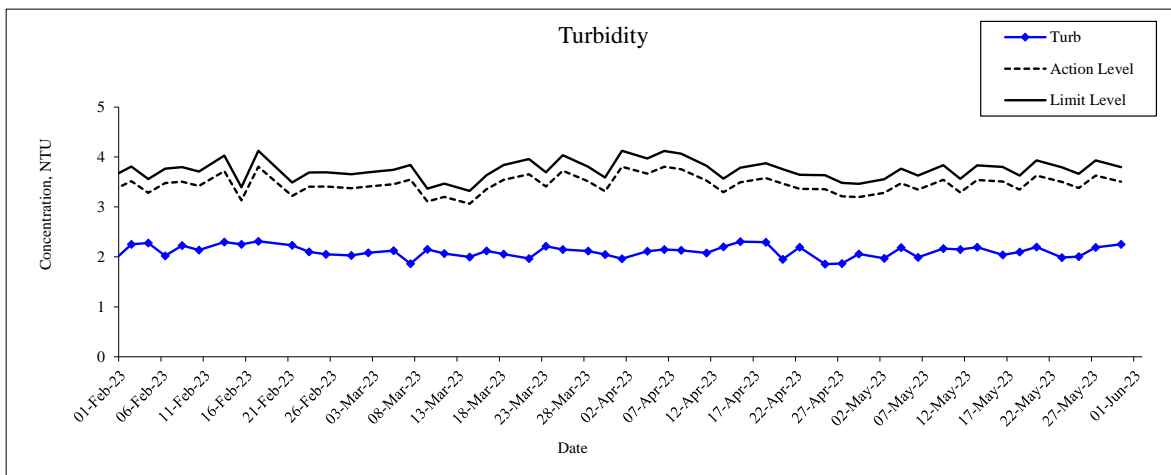
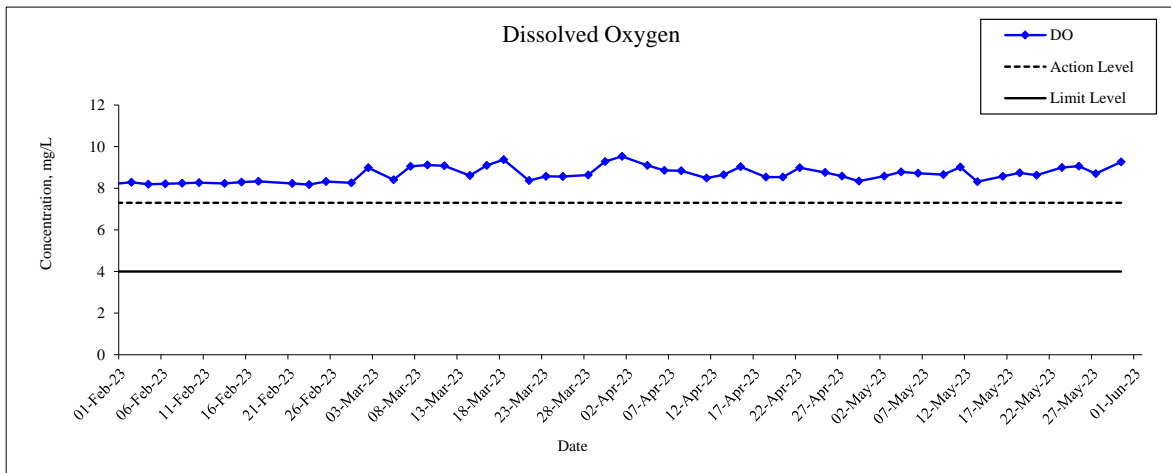


Monitoring Location: WSR1

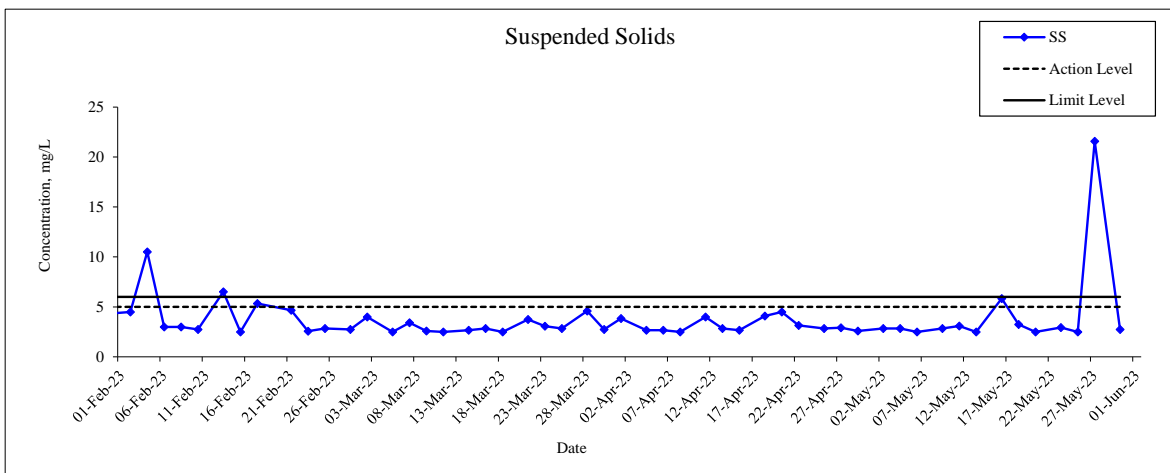
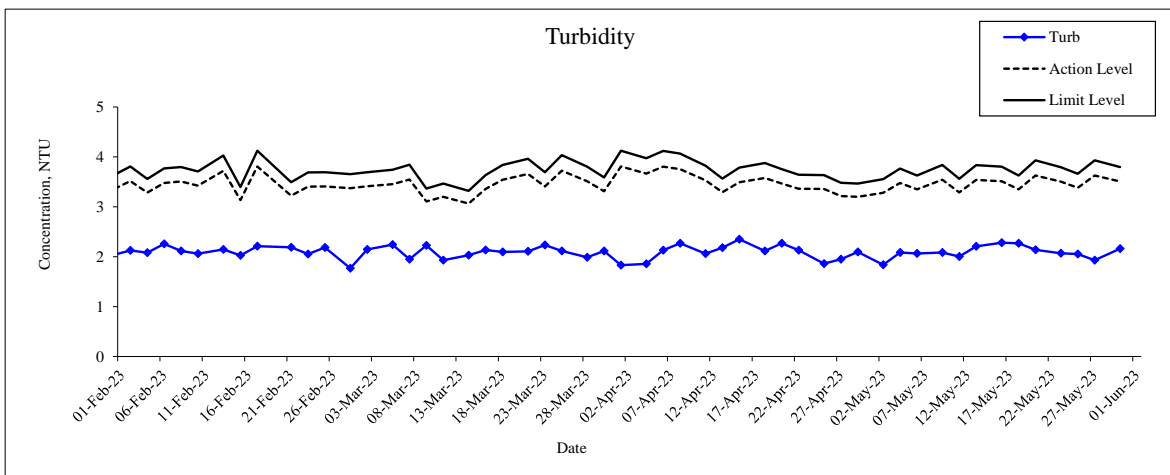
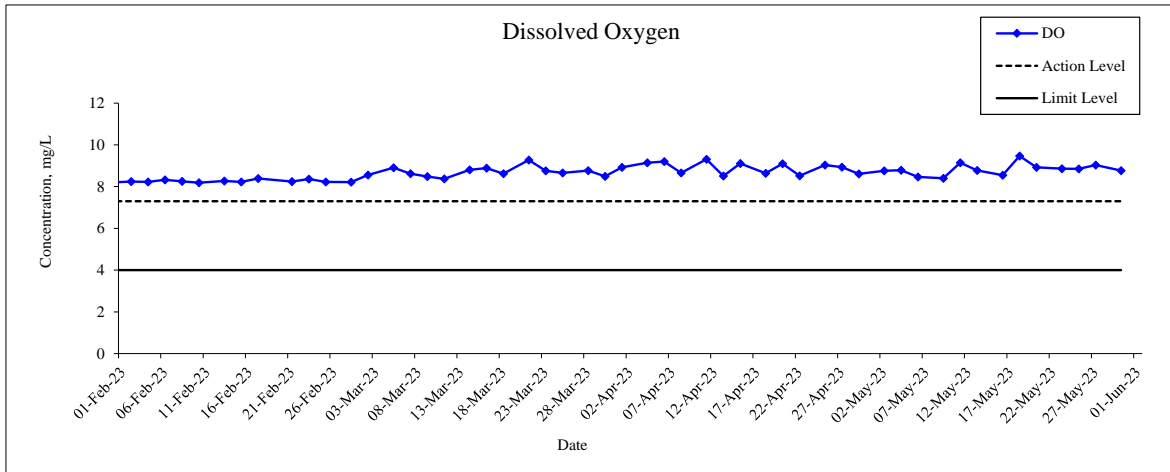




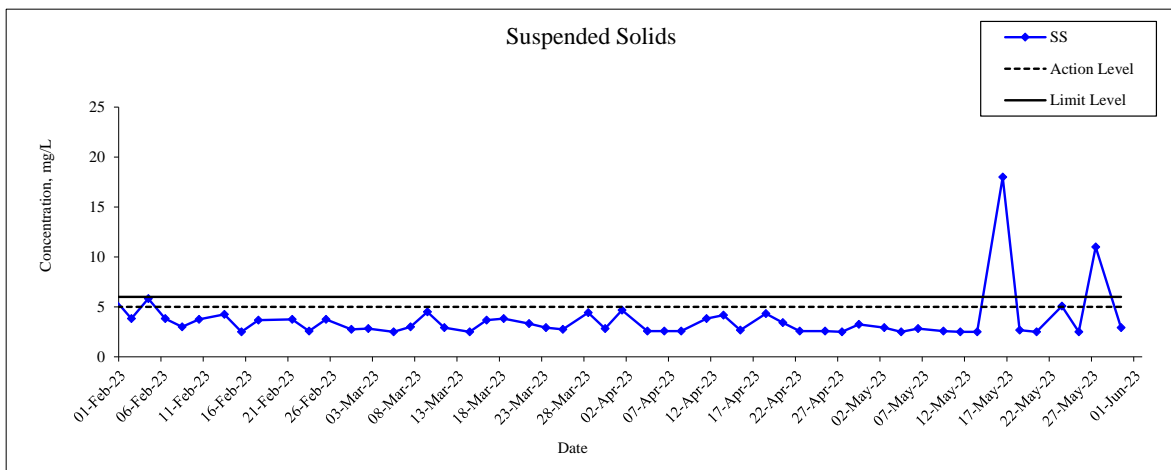
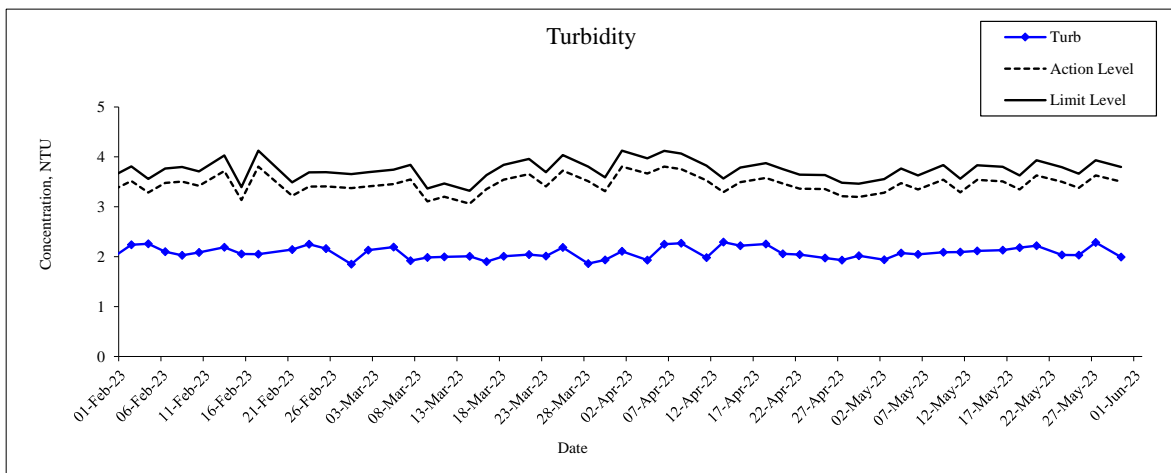
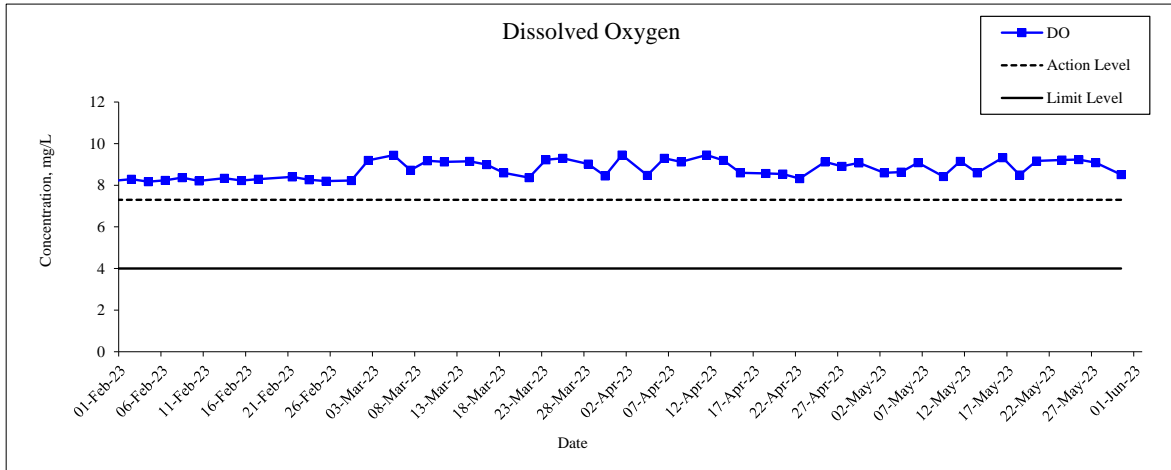
Monitoring Location: WSR2



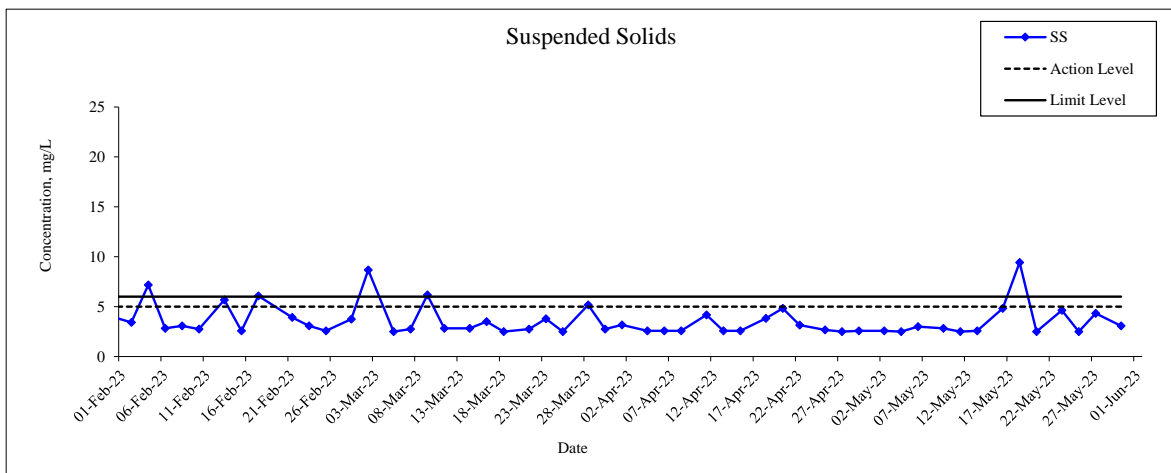
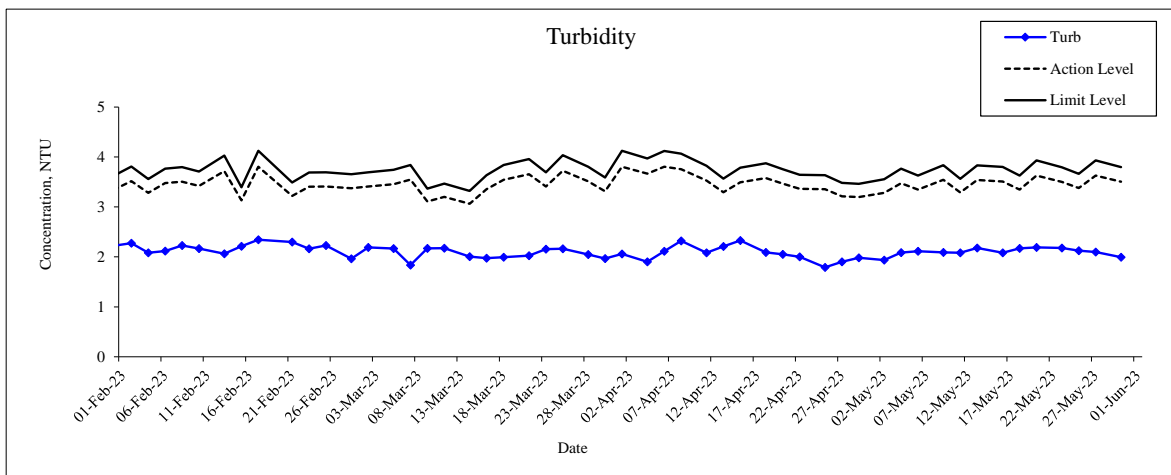
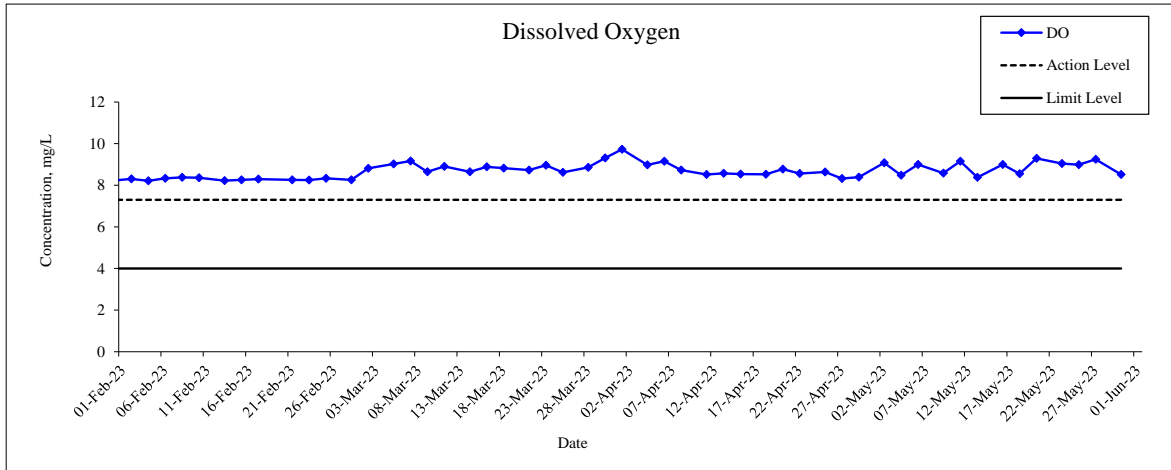
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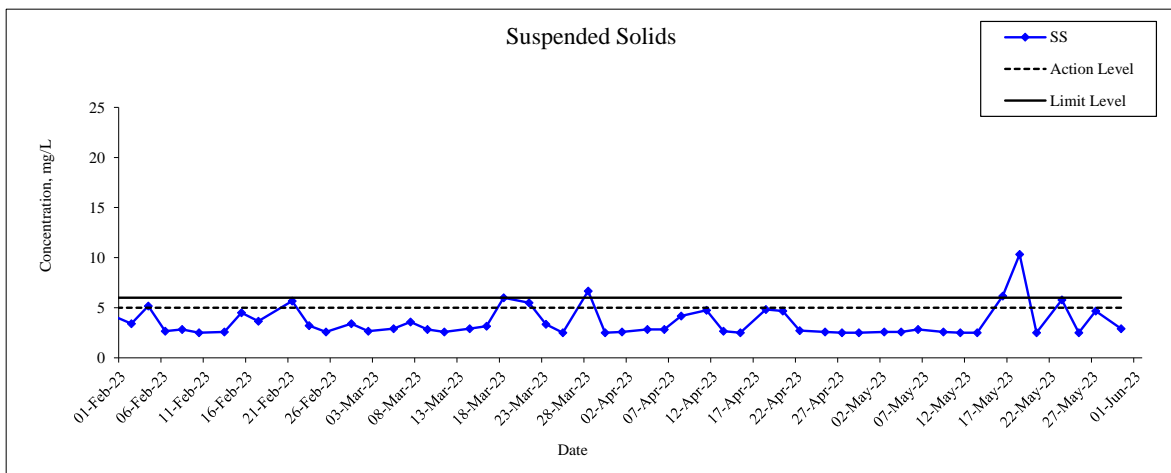
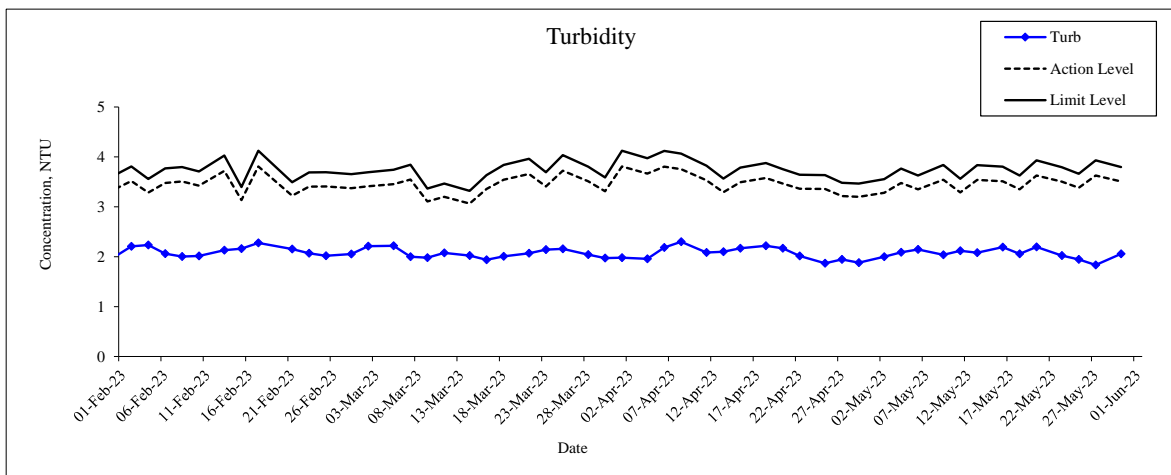
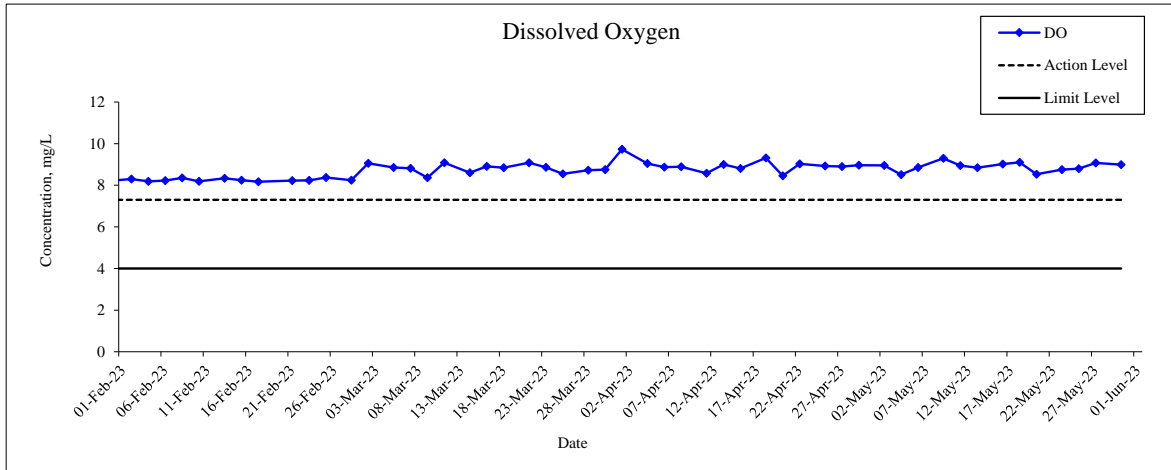
Monitoring Location: WSR4



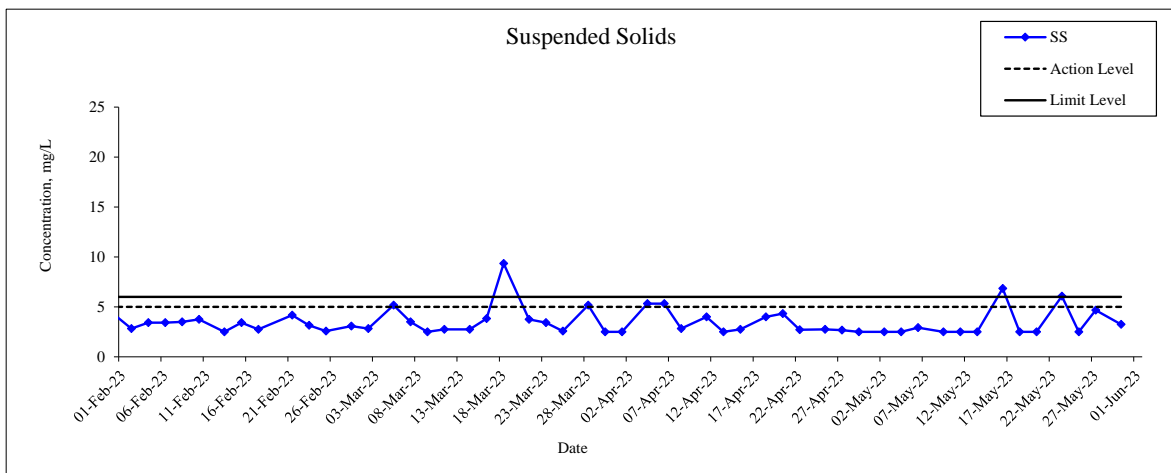
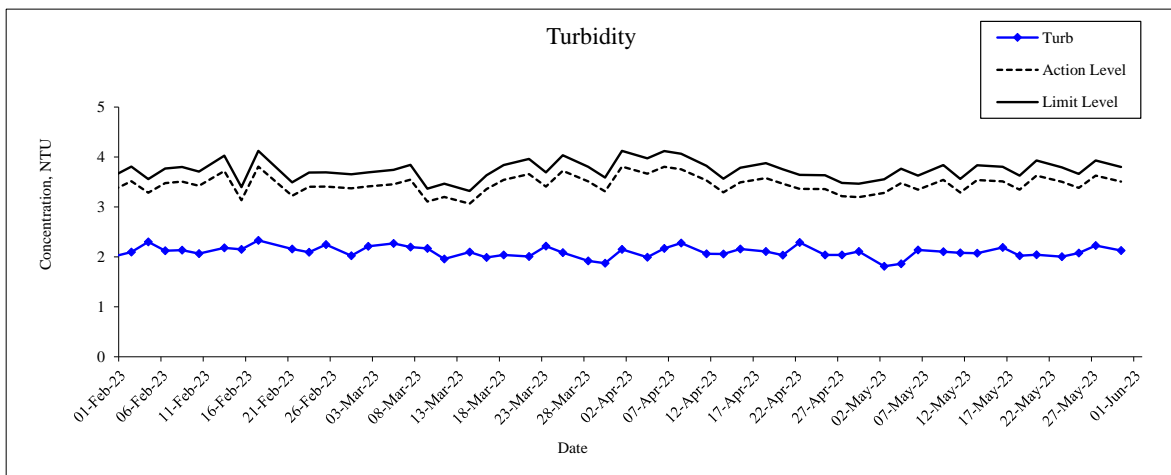
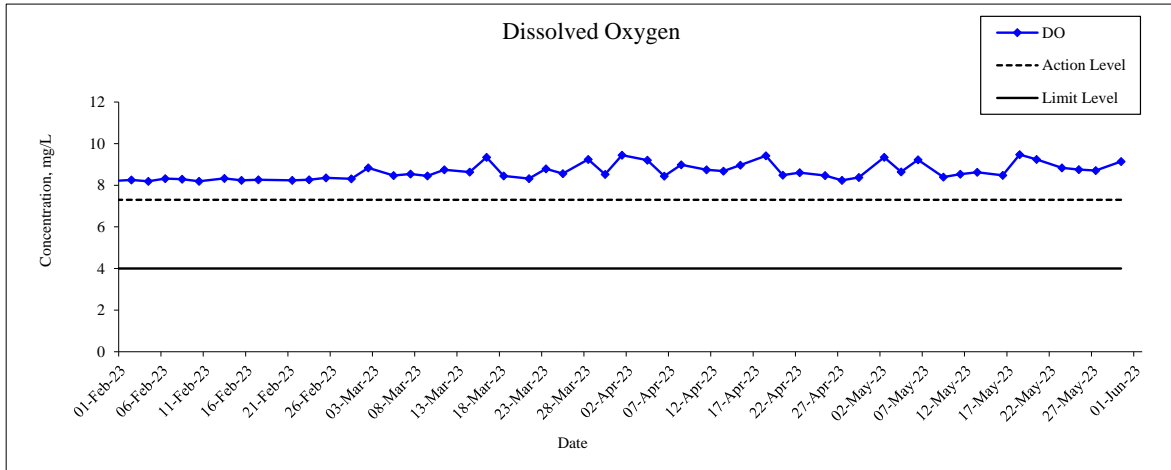
Monitoring Location: WSR16



Monitoring Location: WSR33

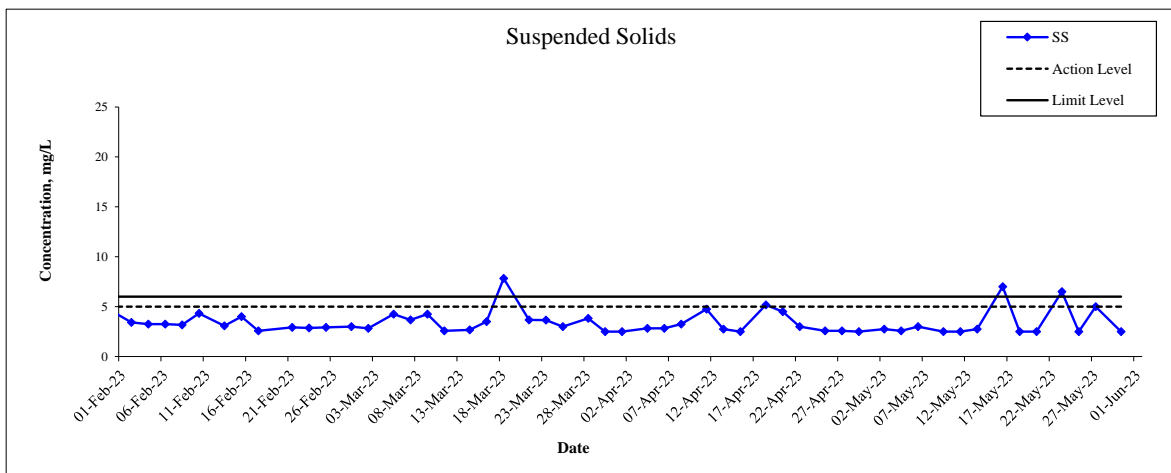
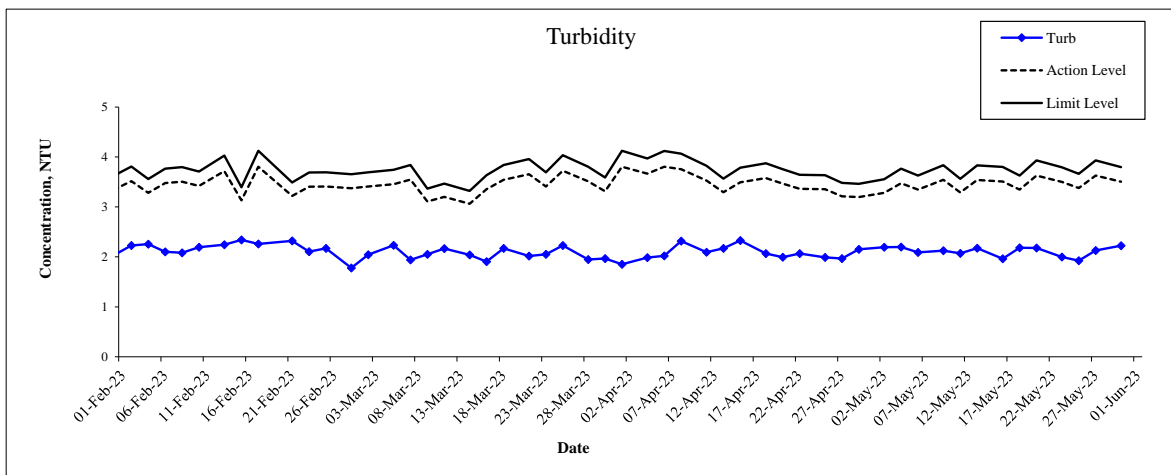
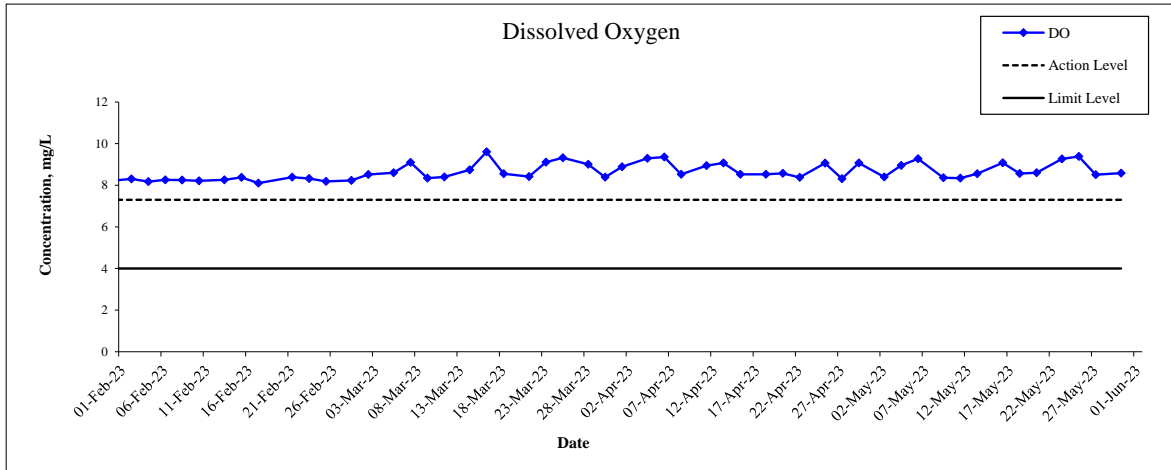


Monitoring Location: WSR36





Monitoring Location: WSR37



# Appendix E

## Summary of Exceedances

Table E1 Summary of Exceedance in March 2023

Date	Station	Tide	SS Level (mg/L)	Action Level	Limit Level
02/03/2023	WSR1	Flood	19.17	Y	Y
	WSR16	Flood	15.67	Y	Y
	WSR33	Flood	6.17	Y	Y
	WSR37	Flood	6.67	Y	Y
	WSR3	Ebb	4.00	Y	Y
	WSR16	Ebb	8.67	Y	Y
05/03/2023	WSR1	Flood	3.92	Y	Y
	WSR37	Flood	3.83	Y	Y
	WSR36	Ebb	5.17	Y	Y
	WSR37	Ebb	4.25	Y	Y
07/03/2023	WSR1	Flood	4.00	Y	N
	WSR2	Flood	5.75	Y	Y
	WSR37	Flood	4.00	Y	N
	WSR2	Ebb	4.50	Y	Y
	WSR3	Ebb	3.42	Y	N
	WSR33	Ebb	3.58	Y	Y
	WSR36	Ebb	3.50	Y	Y
09/03/2023	WSR37	Ebb	3.67	Y	Y
	WSR1	Flood	3.25	Y	N
	WSR2	Flood	4.50	Y	Y
	WSR3	Flood	3.67	Y	Y
	WSR16	Flood	3.25	Y	N
	WSR2	Ebb	3.75	Y	Y
	WSR4	Ebb	4.50	Y	Y
	WSR16	Ebb	6.17	Y	Y
11/03/2023	WSR37	Ebb	4.25	Y	Y
	WSR2	Flood	3.33	Y	N
	WSR3	Flood	6.42	Y	Y
	WSR1	Ebb	5.00	Y	Y
14/03/2023	WSR2	Ebb	6.33	Y	Y
	WSR4	Flood	4.83	Y	Y
	WSR37	Flood	10.00	Y	Y
16/03/2023	WSR1	Ebb	5.25	Y	Y
	WSR2	Flood	8.50	Y	Y
	WSR4	Flood	6.17	Y	Y
	WSR16	Flood	5.83	Y	N
18/03/2023	WSR33	Flood	6.50	Y	Y
	WSR3	Flood	3.83	Y	Y
	WSR4	Flood	7.00	Y	Y
	WSR16	Flood	5.67	Y	Y
	WSR33	Flood	3.67	Y	Y
	WSR36	Flood	3.67	Y	Y
	WSR37	Flood	4.92	Y	Y
18/03/2023	WSR4	Ebb	3.83	Y	N
	WSR33	Ebb	6.00	Y	Y

Date	Station	Tide	SS Level (mg/L)	Action Level	Limit Level
	WSR36	Ebb	9.33	Y	Y
	WSR37	Ebb	7.83	Y	Y
21/03/2023	WSR33	Flood	4.08	Y	N
	WSR1	Ebb	5.75	Y	Y
	WSR33	Ebb	5.50	Y	Y
23/03/2023	WSR2	Ebb	4.25	Y	Y
	WSR16	Ebb	4.00	Y	N
28/03/2023	WSR1	Ebb	4.17	Y	Y
	WSR2	Ebb	5.50	Y	Y
	WSR3	Ebb	4.58	Y	Y
	WSR4	Ebb	4.42	Y	Y
	WSR16	Ebb	5.17	Y	Y
	WSR33	Ebb	6.67	Y	Y
	WSR36	Ebb	5.17	Y	Y
	WSR37	Ebb	3.83	Y	Y

Table E2 Summary of Exceedance in April 2023

Date	Station	Tide	SS Level (mg/L)	Action Level	Limit Level
01/04/2023	WSR16	Flood	7.92	Y	Y
	WSR33	Flood	12.50	Y	Y
	WSR36	Flood	5.08	Y	Y
	WSR37	Flood	7.00	Y	Y
	WSR2	Ebb	3.42	Y	Y
	WSR3	Ebb	3.83	Y	Y
	WSR4	Ebb	4.67	Y	Y
04/04/2023	WSR16	Ebb	3.17	Y	N
	WSR33	Flood	3.58	Y	N
06/04/2023	WSR37	Flood	3.50	Y	N
	WSR1	Flood	4.25	Y	Y
	WSR1	Ebb	3.42	Y	N
	WSR2	Ebb	4.08	Y	Y
08/04/2023	WSR36	Ebb	5.33	Y	Y
	WSR1	Ebb	4.17	Y	Y
11/04/2023	WSR2	Ebb	3.25	Y	N
	WSR16	Ebb	4.17	Y	N
	WSR33	Ebb	4.75	Y	Y
13/04/2023	WSR37	Ebb	4.75	Y	Y
	WSR33	Flood	3.58	Y	N
15/04/2023	WSR1	Ebb	5.83	Y	Y
	WSR36	Flood	3.08	Y	N
18/04/2023	WSR33	Ebb	4.83	Y	N
	WSR37	Ebb	5.17	Y	Y
20/04/2023	WSR1	Ebb	4.50	Y	Y
	WSR2	Ebb	3.92	Y	Y
	WSR3	Ebb	4.50	Y	Y
	WSR4	Ebb	3.42	Y	Y

Date	Station	Tide	SS Level (mg/L)	Action Level	Limit Level
	WSR16	Ebb	4.83	Y	Y
	WSR33	Ebb	4.67	Y	Y
	WSR36	Ebb	4.33	Y	Y
	WSR37	Ebb	4.50	Y	Y

Table E3 Summary of Exceedance in May 2023

Date	Station	Tide	SS Level (mg/L)	Action Level	Limit Level
02/05/2023	WSR33	Flood	3.75	Y	Y
	WSR1	Ebb	14.92	Y	Y
	WSR2	Ebb	11.17	Y	Y
11/05/2023	WSR3	Ebb	3.08	Y	N
16/05/2023	WSR2	Flood	3.33	Y	N
	WSR3	Flood	3.67	Y	Y
	WSR4	Flood	4.50	Y	Y
	WSR16	Flood	3.83	Y	Y
	WSR33	Flood	5.17	Y	Y
	WSR36	Flood	4.75	Y	Y
	WSR37	Flood	6.17	Y	Y
	WSR1	Ebb	3.83	Y	Y
	WSR2	Ebb	4.33	Y	Y
	WSR3	Ebb	5.83	Y	Y
	WSR4	Ebb	4.83	Y	Y
	WSR16	Ebb	18.00	Y	Y
	WSR33	Ebb	6.17	Y	Y
WSR36	Ebb	6.83	Y	Y	
WSR37	Ebb	7.00	Y	Y	
18/05/2023	WSR3	Flood	3.67	Y	N
	WSR4	Flood	3.83	Y	Y
	WSR37	Flood	11.08	Y	Y
	WSR4	Ebb	9.42	Y	Y
	WSR33	Ebb	10.33	Y	Y
23/05/2023	WSR2	Ebb	3.58	Y	N
	WSR4	Ebb	5.00	Y	Y
	WSR16	Ebb	5.50	Y	Y
	WSR33	Ebb	6.33	Y	Y
	WSR36	Ebb	6.67	Y	Y
	WSR37	Ebb	7.17	Y	Y
27/05/2023	WSR2	Ebb	5.17	Y	Y
	WSR3	Ebb	21.58	Y	Y
	WSR4	Ebb	4.33	Y	Y
	WSR16	Ebb	11.00	Y	Y
	WSR33	Ebb	4.67	Y	Y
	WSR36	Ebb	4.67	Y	Y
	WSR37	Ebb	5.00	Y	Y

# Appendix F

## Waste Flow Table



### Monthly Summary Waste Flow Table for 2023 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)
Jan	3383.820	0.000	0.000	0.000	3383.820	0.000	0.000	0.000	0.000	143.690	
Feb	0.000	0.000	0.000	0.000	0.000	0.002	0.138	0.010	0.000	115.880	
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	205.410	
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	255.720	
May	2088.990	0.000	0.000	0.000	2088.990	0.000	0.000	0.000	0.000	202.270	
Jun											
Sub-total	5472.810	0.000	0.000	0.000	5472.810	0.002	0.138	0.010	0.000	922.970	
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	5472.810	0.000	0.000	0.000	5472.810	0.002	0.138	0.010	0.000	922.970	

# Appendix G

## Complaint Log

**Table G1 Statistical Summary of Environmental Complaints**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 March 2023 - 31 May 2023	0	1	N/A

**Table G2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Details
1 March 2023 - 31 May 2023	0	0	N/A

**Table G3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Details
1 March 2023 - 31 May 2023	0	0	N/A

## Appendix H

# Event/ Action Plan for Water Quality Exceedance

Table G1 Event and Action Plan for Water Quality Monitoring

Event	Action ET	IEC	Contractor(s)	ER
Action Level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat <i>in situ</i> measurement on the next day of exceedance to confirm findings;</li> <li>Check monitoring data, plant, equipment and Contractor(s)'s working methods;</li> <li>Identify source(s) of impact and record in notification of exceedance;</li> <li>Inform IEC, Contractor(s) and ER.</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor(s)'s working methods;</li> <li>Inform EPD.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Check plant and equipment and rectify unacceptable practice</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing.</li> </ol>
Action Level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> <li>Repeat <i>in situ</i> measurement on the next day of exceedance to confirm findings;</li> <li>Check monitoring data, plant, equipment and Contractor(s)'s working methods;</li> <li>Identify source(s) of impact and record in notification of exceedance;</li> <li>Inform IEC, Contractor(s) and ER;</li> <li>Discuss with IEC and Contractor(s) on additional mitigation measures and ensure that they are implemented</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor(s)'s working methods;</li> <li>Inform EPD;</li> <li>Discuss with ET and Contractor(s) on additional mitigation measures and advise ER accordingly;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Check plant and equipment and rectify unacceptable practice;</li> <li>Consider changes of working methods;</li> <li>Discuss with ET and IEC on additional mitigation measures and propose them to ER within 3 working days;</li> <li>Implement the agreed mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Discuss with the IEC on the proposed additional mitigation measures and agree on the mitigation measures to be implemented.</li> <li>Ensure additional mitigation measures are properly implemented.</li> </ol>
Limit Level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat <i>in situ</i> measurement on the next day of exceedance to confirm findings;</li> <li>Check monitoring data, plant, equipment and Contractor(s)'s working methods;</li> <li>Identify source(s) of impact and record in notification of exceedance;</li> <li>Inform IEC, Contractor(s) and ER;</li> <li>Discuss with IEC and Contractor(s) on additional mitigation measures and ensure that they are implemented</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor(s)'s working methods;</li> <li>Inform EPD;</li> <li>Discuss with ET and Contractor(s) on additional mitigation measures and advise ER accordingly;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Check plant and equipment and rectify unacceptable practice;</li> <li>Critically review the need to change working methods;</li> <li>Discuss with ET and IEC on additional mitigation measures and propose them to ER within 3 working days;</li> <li>Implement the agreed mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Discuss with the IEC on the proposed additional mitigation measures and agree on the mitigation measures to be implemented.</li> <li>Ensure additional mitigation measures are properly implemented.</li> <li>Request Contractor(s) to critically review the working methods.</li> </ol>
Limit Level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> <li>Repeat <i>in situ</i> measurement on the next day of exceedance to confirm findings;</li> <li>Check monitoring data, plant, equipment and Contractor(s)'s working methods;</li> <li>Identify source(s) of impact and record in notification of exceedance;</li> <li>Inform IEC, Contractor(s) and ER;</li> <li>Discuss with IEC and Contractor(s) on additional mitigation measures and ensure that they are implemented</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor(s)'s working methods;</li> <li>Inform EPD;</li> <li>Discuss with ET and Contractor(s) on additional mitigation measures and advise ER accordingly;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Check plant and equipment and rectify unacceptable practice;</li> <li>Critically review the need to change working methods;</li> <li>Discuss with ET and IEC on additional mitigation measures and propose them to ER within 3 working days;</li> <li>Implement the agreed mitigation measures.</li> <li>As directed by ER, slow down or stop all or part of the marine construction works/ production volume of the desalination plant until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of exceedance in writing;</li> <li>Discuss with the IEC on the proposed additional mitigation measures and agree on the mitigation measures to be implemented.</li> <li>Ensure additional mitigation measures are properly implemented.</li> <li>Request Contractor(s) to critically review the working methods;</li> <li>Consider and instruct, if necessary, the Contractor(s) to slow down or to stop all or part of the marine construction works/ production volume of the desalination plant until no exceedance of Limit Level.</li> </ol>

Notes : ET = Environmental Team, IEC = Independent Environmental Checker; ER = Engineering Representatives  
 The above actions should be taken within 1 working day after the exceedance is identified during operation phase.

## Appendix I

# Event/ Action Plan for Construction Noise Exceedance



Table E1 Event and Action Plan for Construction Noise Monitoring

Event	Action			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Carry out investigation to identify the source and cause of the complaint/ exceedance(s)</li> <li>2. Notify IEC, ER, and Contractor and report the results of investigation to the Contractor; ER and the IEC</li> <li>3. Discuss with the Contractor and IEC for remedial measures required</li> <li>4. If the complaint is related to the Project, conduct additional monitoring for checking mitigation effectiveness and report the findings and results to the IEC, ER and the Contractor</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analyzed results submitted by the ET</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of Notification of Exceedance in writing</li> <li>2. Require Contractor to propose remedial measures for the analysed noise problem</li> <li>3. Ensure remedial measures are properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals, if required, to the IEC and ER</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Carry out investigation to identify the source and cause of the exceedance</li> <li>2. Notify IEC, ER, Project Proponent, EPD and Contractor</li> <li>3. Repeat measurements to confirm findings</li> <li>4. Provide investigation report to IEC, ER, EPD and Contractor he causes of the exceedances</li> <li>5. If the exceedance is related to the Project, assess effectiveness by additional monitoring.</li> <li>6. Report the remedial action implemented and the additional monitoring results to IEC, EPD, ER and Contractor</li> <li>7. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analyzed results submitted by the ET</li> <li>2. Discuss the potential remedial measures with ER, ET Leader and Contractor</li> <li>3. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>4. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of Notification of Exceedance in writing</li> <li>2. Require the Contractor to propose remedial measures for the analysed noise problem</li> <li>3. Ensure remedial measures are properly implemented</li> <li>4. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor; in agreement with the Project Proponent, to stop that activity of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant activity of works as determined by the Project Proponent until the exceedance is abated</li> </ol>

Notes : ET = Environmental Team, IEC = Independent Environmental Checker; ER = Engineering Representatives