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Your Ref: -
Our Ref: 60627779/C/FYW2008051

By Email

Drainage Services Department
42/F, Revenue Tower,
5 Gloucester Road,
Wan Chai, Hong Kong

Attn: Mr. K K Leung

5 August 2020

Dear Sir,

Contract No. CM 12/2019
Expansion of Sha Tau Kok Sewage Treatment Works –
Environmnntal Team Services for Construction Phase (2020-2021)
Certification for Emergence Response Plan for TSTP

Reference is made to the submission of Emergence Response Plan (August 2020) for TSTP by Kingsford Environmental (HK) Limited.

We have no further comment and hereby certify the captioned document in accordance with the requirement stipulated in Condition 2.17 of Environmental Permit No. EP-517/2017/A.

Should you have any queries, please feel free to contact the undersigned at 3922 9366.

Yours faithfully,
AECOM Asia Co. Ltd.

Y W Fung
Environmental Team Leader

cc by email

Black & Veatch Hong Kong Limited	Kevin Chan / Lawrence Yau / Anthony Leung
ANEWR Consulting Limited	Adi Lee / Hazel Chan
Kingsford Environmental (HK) Limited	Peter Fok /Stanley Lau / Ellis Chu

ANEWR

Drainage Services Department
42/F, Revenue Tower
5 Gloucester Road
Wan Chai
Hong Kong

Your reference:

Our reference: HKDSD206/50/106689

Date: 5 August 2020

Attention: Mr K K Leung

BY EMAIL & POST
(email: kkleung04@dsd.gov.hk)

Dear Sirs

Agreement No.: CM 14/2018
Independent Environmental Checker Services for
Expansion of Sha Tau Kok Sewage Treatment Works
Emergency Response Plan

We refer to email of 4 August 2020 attaching the Emergency Response Plan dated August 2020 prepared by Kingsford Environmental (HK) Limited.

We have no comment and hereby verify the captioned plan in accordance with condition 2.17 of the Environmental Permit no. EP-517/2017/A.

Should you have any queries, please do not hesitate to contact the undersigned or our Mr Adi Lee at 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

James Choi
Independent Environmental Checker

CPSJ/LYMA/lhmh

cc DSD – Ms Roxana Yeung (email: hcyeung@dsd.gov.hk)
Black & Veatch Hong Kong Limited – Mr Kevin Chan (email: re_c1@dc1803.com.hk)
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ISO 9001 : 2015
Certificate No.: CC 3988

KINGSFORD ENVIRONMENTAL (H.K.) LTD.
Consultancy Engineering & Contracting

Sub-Contract No. 1828/6002
Provision, Operation and Maintenance of Temporary Sewage Treatment Plant

For

Contract No. DC/2018/03
Expansion of Sha Tau Kok Sewage Treatment Works Phase 1 and Village Sewerage in Tong To

EMERGENCY RESPONSE PLAN

Drainage Services Department
Consultants Management Division
42/F., Revenue Tower
5 Gloucester Road
Wan Chai, Hong Kong

Black & Veatch Hong Kong Ltd.
43/F, AIA Kowloon Tower
100 How Ming Street
Kwun Tong, Kowloon
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Build King-Kum Shing Joint Venture
Units 601-605A, 6/F., Tower B
Manulife Financial Centre
223 Wai Yip Street
Kwun Tong, Kowloon

August 2020
Doc. Ref.: 2020/82127/STK-TSTP/ERP1.5

TABLE OF CONTENTS

1.0 Introduction

According to Condition 2.17 of the Environmental Permit (EP) (EP No. 517/2017/A), the Permit Holder has to submit an Emergency Response Plan before the commencement of operation of the TSTP for approval by the EPD.

This Emergency Response Plan (ERP) is prepared to outline:

(i) the Sha Tau Kok Temporary Sewage Treatment Plant (STK TSTP) Emergency Response planning during the TSTP Operation Period, and

This ERP shall include the following:

(i) Locations of sensitive receivers in the vicinity of the emergency discharge outlet;

(ii) List of bodies to be informed or involved;

(iii) List of mariculturists to be informed;

(iv) Reporting procedures;

(v) Responsibilities and procedures for clean-up of the affected water body / sensitive receivers; and

(vi) Investigation arrangement of incidents that affect nearby fish culture zone, including water sampling, assessing of the impact, investigating the cause of any fish kill / loss of fishery, and the relevant departments to be consulted .

2.0 Performance Monitoring of TSTP

2.1 Background Information of TSTP

Influent Characteristics

The design Average Dry Weather Flow (ADWF) for the TSTP shall be 2,500 m^3/day. The TSTP shall be designed to cope with the Peak Wet Weather Flow (PWWF) which is defined as 3 times of the ADWF and the Balanced Peak Flow which is defined as 1.2 times of the ADWF. Various design flow rates for the TSTP are summarized in the following table:

Flow	Flowrate	Remarks
Average Dry Weather Flow (ADWF)	2,500 m^3/day	Design average flow for the TSTP
Peak Wet Weather Flow (PWWF) or Unbalanced Peak Flow	7,500 m^3/day	Design peak flow for Inlet Pumping Station, Package Pre-treatment Plant and Equalization Tank of the TSTP
Balanced Peak Flow	3,000 m^3/day	Design peak flow for Mechanical Filter Mesh System, Moving bed biofilm reactor (MBBR), Dissolved Air Flotation (DAF) System and In-Pipe UV Disinfection System of the TSTP

	Determinand*	
i.	*5-day Biochemical Oxygen Demand (BOD_5) Conc.*	*143 mg/L*
ii.	*Total Suspended Solids (TSS) Conc.*	*136 mg/L*
iii.	*Ammonia-Nitrogen (NH_3-N) Conc.*	*25 mg/L*
iv.	*Total Kjeldahl Nitrogen (TKN) Conc.*	*36 mg/L*
v.	*Sewage Temperature*	*18 ~ 30 ^oC*

**Source of the above determinand: Clause 4.1.4 of Tender Particular Specification PS33B*

Effluent Requirements

The quality of the effluent discharge from the TSTP shall, without dilution and use of chemical disinfection, shall comply with the following effluent discharge standards.

	Determinand	**95%tile Limit**	**Upper Limit**
i.	*BOD_5 Conc.*	*13 mg/L*	*26 mg/L*
ii.	*TSS Conc.*	*19 mg/L*	*38 mg/L*
iii.	*Total Nitrogen (TN) Conc.*	*29 mg/L*	*58 mg/L*
iv.	*Total Phosphorus (TP) Conc.*	*5 mg/L*	*10 mg/L*
v.	*E. Coli**	*1,000 Count/100mL*	*100 Count/100mL (monthly geometric mean)*

*The numeric limits of *E. coli* concentration are expressed as the 95th percentile value and the monthly geometric mean. When the value of *E. coli* concentration is 0, the value shall be taken as 1 in the monthly geometric mean calculation. For clarity purpose, geometric mean of n numbers is defined as the nth root of the product of the n numbers.

2.2 Monitoring of the Performance of TSTP

In order to ensure the discharge from the TSTP is in fully compliant with the discharge standard as stipulated in Clause 4.2.1 of Tender Particular Specification PS33B, the performance parameters of the TSTP will be monitored as per following table.

Location	Determinand[1]/ Parameter	Frequency	Measurement Equipment** / Testing Requirements
STK TSTP Influent	Flow (Inlet Pumping Station) • Hourly • Daily • Cumulative	• Instantaneous	• Electromagnetic flow meter with flow totaliser
	Quality • pH • Temperature • TSS • *E.coli* • Ammonia-N • TSS • BOD_5 • COD • TN • TP • Oil & grease	• Instantaneous • Instantaneous • Instantaneous • Daily • Daily • Daily • Daily • Daily • Daily • Daily • 4 times/week	• On-line pH sensor • On-line temperature sensor • On-line TSS sensor • Grab samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • Grab samples*
Effluent	Quality • pH • Temperature • TSS • *E.coli* • Ammonia-N • TSS • BOD_5 • COD • TN • NOx-N • Chloride • TP • Oil & grease	• Instantaneous • Instantaneous • Instantaneous • Daily • Daily • Daily • Daily • Daily • Daily • Once a week • Once a week • Daily • 4 times/week	• On-line pH sensor • On-line temperature sensor • On-line TSS sensor • Grab samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • 24-hour composite samples* • Grab samples*

Equalization Tank	• Water level	• Instantaneous	• On-line level sensor
Package Pre-treatment Plant – Screenings and grit quantity	• Weight of screenings and grit	• Daily	• Calibrated balance
Mechanical Filter Mesh	• Rotating speed • Cumulative running hour	• Instantaneous • Instantaneous	• Via sensor and equipment PLC • Mechanical filter hour run meter
Air blower (MBBR)	• Air flow rate • Daily flow rate • Cumulative running hours	• Instantaneous • Instantaneous • Instantaneous	• On-line air flow meter • Air flow meter flow totaliser • Air blower hour run meter
MBBR	• Dissolved oxygen at each Aerobic Tank and Deoxygenation Tank • Total air flow rate to each Aerobic Tank • Ammonia-N at Deoxygenation Tank • Nitrate-N at Anoxic Tank and Deoxygenation Tank • Top water level at Anoxic Tank	• Instantaneous • Instantaneous • Instantaneous • Instantaneous • Instantaneous	• On-line DO sensor • Air flow meter with flow totaliser • On-line ammonia-N sensor • On-line nitrate-N sensor • On-line level sensor
DAF	• Cumulative running hours	• Instantaneous	• DAF hour run meter
Chemicals (each chemical)	• Bulk quantity delivered • Dosing rate • Hourly average • Daily total	• On delivery • At new setting • Instantaneous • Instantaneous	• Calibrated balance or supplier delivery note • SCADA system • Dosing pump hour run meter • Dosing pump totaliser
UV Transmittance UV lamps	• Efficiency • Cumulative running hours	• Instantaneous • Daily • Instantaneous	• On-line UVT meter • Laboratory test • UV lamp hour run meter

Sludge Facilities Thickened sludge in Sludge Holding Tank Sludge draw-off from DAF	• Solids content • Daily quantity • Solids content	• Daily • Instantaneous • Daily	• Grab sample • Electromagnetic flow meter with flow totaliser • On-site laboratory
Inlet Pumping Station Pump	• Electric current • Efficiency • Cumulative running hours • Trip/alarm records • On/Off logs	• Instantaneous • Monthly • Daily • Daily • Daily	• Ampere meter • Calculation • Pump hour run meter • From pump PLC • From pump PLC
Effluent Outlet Chamber to Outfall Freedboard to top water level of flow Tide level	• Alarm Level • Level	• Instantaneous • Weekly	• On-line level sensor • Nearest tide gauging station
Deodorisation System Flow Odour levels Chemicals (each type of chemical)	• Air flow rate • Outlet H_2S level • Dosing rate • Daily total	• At new setting • Instantaneous • At new setting	• On-line air flow meter • On-line H_2S sensor • On-line flow meter • Flow meter totaliser
Power All major units and total	• Electricity consumption	• Instantaneous	• Power meters
Gases At all treatment units – EQ Tank, PPP, MFM, MBBR and DAF units	• H_2S • Methane • CO_2 • Oxygen	• Three times/day	• 4-in-1 gas detector
Miscellaneous Outdoor odour level at a minimum of six (6) locations around the Site[#]	• H_2S	• Three times/day	• Portable H_2S analyser

Outdoor plant boundary noise level at a minimum of six (6) locations[#]	• Sound level	• Three times/day	• Portable sound level meter

Note
[1] - The term "determinand" shall mean the concentration of a pollutant or property of a sample whose numeric value is required.
* - All samples collected shall be sent to an HOKLAS Laboratory to carry out the required chemical analyses or microbiological tests.
** - All items of measurement equipment specified shall be provided by the Contractor and approved by the Project Manager.
[#] - The six (6) locations shall be proposed by the Contractor and approved by the Project Manager.

3.0 TSTP Plant Performance & Emergency Reporting Procedure

3.1 Regular briefings on the performance of TSTP

3.1.1 Regular on-site briefing (weekly / monthly) on the performance of TSTP shall be jointly attended by the Main Contractor (BKKSJV), E&M Sub-contractor/Operator (KEL), B&V and DSD (if necessary). The schedule of the briefing shall comprise, but not limited to, review on the trends on process monitoring parameters, operational log, chemical consumption log, accident log and operator's report on any abnormality observed.

3.1.2 Briefing on the performance of TSTP will be held on an ad-hoc basis should B&V or DSD consider it is necessary.

3.2 Round-the-Clock Notification Mechanism

3.2.1 According to Clause 9.1.9 of PS Section 33B, all data signals from instruments to be provided in this Contract shall have digital display locally in the Container Central Control Room and all the data signals shall be repeated and transmitted to the Shek Wu Hui Sewage Treatment Works (SWHSTW) master station via the SCADA System for remote monitoring, control and recording.

3.2.2 The reporting system for handling abnormalities in water qualities in the process stream and effluent including, but not limited to, TSS, NH_4-N, NO_3-N and TP, etc., shall be agreed prior to commencing the TSTP Operation Period. Notification mechanism will be developed based upon the critical abnormalities as identified in the Clause 4.0 to report any potential non-compliance events to the stakeholders including DSD.

3.2.3 Under normal TSTP operation, TSTP Plant Manager (or TSTP Person-In-Charge) will inform the Main Contractor (i.e. BKKSJV) and the Project Manager (i.e. B&V) within two (2) hours for any TSTP operation issues and/or abnormalities.

Person In-charge for the Notification Mechanism

- Project Manager (B&V): RE (Process) / ARE (Process)
- Main Contractor (BKKSJV): Site Agent
- E&M Sub-contractor (KEL): TSTP Plant Manager

3.2.4 In case if the TSTP operation issues and/or abnormalities may cause sub-standard effluent quality or involving injury and facility damage, the Project Manager will inform DSD (CM and/or ST1) accordingly.

Person In-charge for the Notification Mechanism

- DSD/CM: Engineer
- DSD/ST1: Engineer
- Project Manager (B&V): RE (Process) / ARE (Process)

3.2.5 For the case of unexpected high loading / high flow of incoming sewage, the Contractor and/or TSTP Operator shall liaise with DSD/ST1 to review if there is any abnormality of the incoming sewage from the Shun Lung Street Sewage Pumping Station.

3.2.6 In case that there is critical abnormality of the operation of the TSTP as identified in the

Clause 4.1, TSTP Plant Manager will send message advising the happening of the critical abnormality via a dedicated Whatsapp group which will include all the stakeholders including DSD as stated in the Clause 3.2.3 above. All the stakeholders will then have timely alert of such critical abnormality and could take any necessary action and start to arrange resources as early as possible to rectify the abnormality and reduce the affect caused by such abnormality.

3.2.7 Formal notification will be sent through emails to be followed by printed documentation within four hours after the happening of the critical abnormality to all the stakeholders as stated in the Clause 3.2.3 above. The formal notification will record the time of happening, details of the critical abnormality and immediate rectification work done.

3.2.8 A special meeting with the presence of all the stakeholders will be held within 24 hours after the happening of the critical abnormality to report on the effectiveness of the rectification work, to assess the adverse effect caused by the abnormality, to estimate on the time required to totally rectify such critical abnormality.

3.2.9 Within two weeks after the critical abnormality has been totally rectified, TSTP Plant Manager shall submit a report detailing the cause of such abnormality, degree of adverse effect caused, recommendation on how to prevent the happening of similar abnormality in future.

3.3 Routine Plant Maintenance

3.3.1 B&V will supervise the maintenance works and regularly, on a daily basis, review the checklist records of routine plant maintenance.

3.3.2 The Contractor and/or TSTP Operator shall actively upload the latest daily records of the Routine Plant Maintenance to a cloud storage (i.e. iCloud, Dropbox, google drive, etc.) for B&V's and DSD's review. No sensitive information will be uploaded.

3.4. Corrective Plant Maintenance

3.4.1 The Contractor shall attend and follow up faults within twelve (12) hours and carry out timely corrective maintenance on the failed item(s) of equipment to rectify the equipment failure in the soonest time so as to maintain adequate provision for plant units to ensure continuous, uninterrupted, safe and reliable operation of the TSTP at all times during the TSTP Operation Period.

3.4.2 The stakeholders shall be notified as long as the corrective measures are triggered. The Contractor shall log these events for record and lesson-learnt. Event logs will be properly recorded, and to be available allowing the stakeholders to access.

3.4.3 The Contractor shall actively upload the latest records of the Corrective Plant Maintenance to a cloud storage (i.e. iCloud, Dropbox, google drive, etc.) for B&V's and DSD's review. No sensitive information will be uploaded.

3.5 Weekly and Monthly Reporting

3.5.1 According to Clause 13.1.19 of PS Section 33B, the Contractor shall submit to the Project Manager weekly and monthly reports for the following –

- Weekly and monthly plant monitoring and performance reports for the TSTP; and
- Monthly treated effluent monitoring reporting to the Director of Environmental Protection. The contents of the weekly and monthly plant monitoring and performance reports shall refer to Clause 3.1.2.1 (F) (vi) of PS Section 33B.

3.5.2 B&V would review Contractor's submission and shall report to DSD if any non-compliance or abnormality found as appropriate.

3.6 Emergency Team for Special Events

3.6.1 According to Clause 13.1.20 of PS Section 33B, 'Special Events' shall mean adverse weather conditions such as hoisting of typhoon signal warnings and red and black rainstorm warnings, flooding warning in the Northern New Territories and warnings of other natural disasters. Upon hoisting of these warnings, in addition to the shift operation team, an emergency team shall be established within two (2) hours after

hoisting of the warning until two (2) hours after its cancellation.

3.6.2 The Emergency Team shall comprise at least the Plant Manager, one works supervisor and one operator. The Plant Manager shall implement the emergency plan pertinent to the special event. The emergency plan shall be submitted to the Project Manager at least two (2) months prior to the Testing and Commissioning of the TSTP. In absence of any suitable plan, the Plant Manager shall devise temporary measures to cope with the concerned Special Event.

3.6.3 The Emergency Team shall as far as practicable inspect the major outdoor items of E&M facilities of the TSTP. Due safety precautions shall be taken during the plant inspection.

3.6.4 If necessary, the Emergency Team shall properly secure and protect the major outdoor items of E&M facilities of the TSTP to prevent them from damages that may arise from the special event.

3.6.5 The Reporting Procedures during special events shall refer to Clause 13.1.20.5 of PS Section 33B.

A. Immediately after occurrence of a Special Event, the Plant Manager shall exercise the reporting procedures as specified below.

B. Internal Reporting within the TSTP

i) The shift operation team shall report to the Plant Manager on a half-hourly basis on the performance of the TSTP.

ii) Upon observing any abnormality, the shift operation team shall report the Plant Manager immediately. The abnormality shall be recorded in the plant daily log sheet.

iii) The Plant Manager shall then as far as practicable to redress the abnormality. All actions taken and the final outcome shall be recorded in the plant daily log sheet.

C. Notification of Project Environmental Team (ET) & Independent Environmental Checker (IEC)

Project ET/IEC shall be notified by the Project Manager/DSD upon occurrence of incidents such as non-compliance events, crude sewage bypass events, suspicious of abnormal influent, complete power blackout, chemical spillage leading to discharge of chemical wastes or events that has caused noticeable environmental pollution. ET/IEC shall also be notified and consulted during the investigation of incidents that affect nearby fish culture zone (if any) under Clause 6.2 follows.

D. External Reporting within DSD

i) In parallel, the Plant Manager shall provide bi-hourly verbally reports to the Project Manager or the Supervisor and DSD on the condition of the TSTP.

ii) Upon observing any abnormality, the Plant Manager shall provide verbal report to the Project Manager or the Supervisor immediately and half-hourly thereafter.

iii) When the abnormality has been redressed, the verbal reporting shall resume to bi-hourly intervals until end of the special event.

iv) A brief written report shall be prepared and submitted to the Project Manager within two (2) days after the special event.

v) In case of serious incident happens, a comprehensive report on the serious incident shall be prepared and submitted to the Project Manager within seven (7) working days as per Clause 13.1.21.9 of PS33B.

vi) Thereafter, the reporting system shall resume to that as stated in Clause 3.2 of this Plan.

vii) Whenever an abnormality has occurred, after successful resumption of the TSTP to normal condition, a comprehensive written report shall be prepared and submitted to the Project Manager within three (3) working days from the special event.

3.6.6 Upon occurrence of incidents such as non-compliance events, crude sewage bypass events, suspicious of abnormal influent, complete power blackout, chemical spillage leading to discharge of chemical wastes or events that has caused noticeable environmental pollution, the TSTP Plant Manager shall report to the Project Manager and in turn to Director of Environmental Protection Department (DEP). The Reporting Procedures to DEP during incidents shall refer to Clause 13.1.21 of PS Section 33B (see below).

13.1.21 Reporting Procedures To Director of Environmental Protection During Incidents

13.1.21.1 Prior to commencement of the operation of the TSTP, the Plant Manager shall establish a communication procedures (during working and non-working hours) with the relevant officer of the RO(N) of the EPD for reporting on incidents as specified in Clause 13.1.14.3J of this Particular Specification.

13.1.21.2 The Plant Manager shall make reference to DSD Technical Circular No. 7/2006 on "Handling and Managing Serious and Emergency Incidents".

13.1.21.3 Immediately after occurrence of incidents pertinent to reporting to DEP, the Plant Manager shall make verbal reports within one hour to the relevant officer of RO(N) on the incident with possible causes and estimation on the likely environmental pollution so caused, if any.

13.1.21.4 In parallel, the Plant Manager shall make the same verbal report to the *Project Manager* or the *Supervisor*.

13.1.21.5 The Plant Manager shall take all possible measures to deal with the incident.

13.1.21.6 The Plant Manager shall monitor closely the development of incident

13.1.21.7 The Plant Manager shall mobilise all resources to deal with the situation to avoid it being developed into a crisis. If necessary, the Plant Manager shall request pertinent resources from the *Employer* through the *Project Manager* or the *Supervisor*.

13.1.21.8 After settling the incident, the Plant Manger shall prepare and submit a brief written report on the incident to the *Project Manager* with copy to the RO(N).

13.1.21.9 A comprehensive report on serious incident shall be prepared and submitted to the *Project Manager* within seven (7) working days.

13.1.22 The *Contractor* shall note the requirement stipulated in Clause 3.1.2.2 of this Particular Specification and shall accordingly provide all necessary resources and personnel to fully prepare, implement and execute the Operation and Maintenance Plans as specified in Clause 3.1.2.1 F of this Particular Specification.

13.1.23 The *Contractor* shall also include any additional requirements as deemed necessary for the safe, reliable, environmental friendly and efficient operation and maintenance of the TSTP during the TSTP Operation Period.

3.6.7 The Emergency Team shall provide records of the preparatory actions taken to cater for any forecastable upcoming adverse weather events to B&V and DSD as early as possible but not later than 8 hours in prior of the arrival/occurrence of the adverse weather event.

4.0 Emergency Incidents and Remedial Procedures

This Section Plan is provided for the Plant Operator to handle emergency incidents during the Temporary Sewage Treatment Plant (TSTP) operation and maintenance. There are a number of events that may possibly cause malfunction of the TSTP, which may lead to discharge of sub-standard effluent quality and/or emergency discharge. These events would include:

- Fire
- Overflow
- Power Failure
- Equipment Breakdown
- Ingress of Abnormal Sewage
- Non-compliance with EPD's Discharge Standard
- Emergency Sewage Overflow from Inlet Pumping Station

When these incidents happen, Section 3.2 should be followed such that immediate actions are taken to minimize the possible adverse effects to the TSTP.

4.1 Emergency Incidents

4.1.1 Fire

Upon discovering a fire at site, the Plant Operator should:

a) Remain calm – don't panic.

b) Shout "FIRE" and switch off the main power supply of the TSTP.

c) The Plant Operator should inform the Fire Services Department immediately by dialing 999. Then, to notify the person-in-charge of the TSTP the exact location of the fire.

d) The person-in-charge of the TSTP shall be responsible for supervising the evacuation of personnel from the fire scene and the action to take in fighting the fire. The person-in-charge shall also inform the Project Manager the fire incident immediately.

e) When the extent of the fire will likely affect the normal operation of the plant and may cause emergency discharge, the Plant Manager shall follow the protol as set out in Section 6.3.

4.1.2 Overflow Caused by Plant Breakdown / Piping Leakage

In case of overflow caused by plant breakdown / piping leakage, the Plant Operator should:

a) The Plant Operator to stop all of the site activities immediately.

b) The Plant Operator to check if there is any plant breakdown and/or piping leakage. If it is found, try to stop the leakage source(s) immediately. When required, stop the TSTP operation to control the overflow.

c) The Plant Operator to hoist the warning sign "Danger" or "Overflow" for the affected area. Then, he/she shall report to the person-in-charge of the TSTP.

d) The site's person-in-charge shall inform the Project Manager the overflow incident immediately.

e) The Plant Operator to use a portable submersible pump, if required, to divert overflow water to nearby drain (connected to the Inlet Pumping Station) until the overflow area is under control.

f) The Plant Operator to clean the overflow area.

g) The Plant Operator shall check and rectify the TSTP for any damages. Then, to resume normal TSTP operation as soon as possible.

h) The Plant Operator to record details of the overflow and the corresponded actions taken in the logbook.

i) The Plant Operator to identify the cause(s) of the overflow.

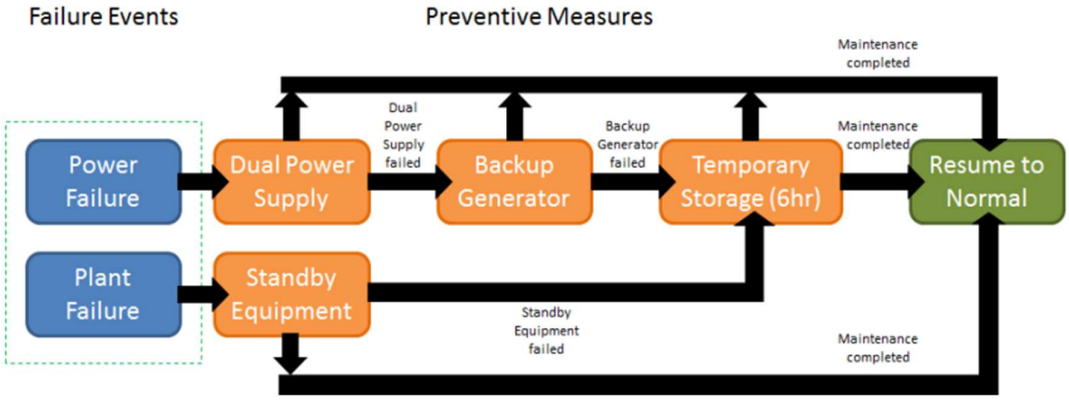
j) The Plant Operator to carry out necessary works to prevent further overflow.

k) In case the Plant Breakdown / Piping Leakage will likely affect the normal operation of the plant for a prolong period and lead to the requirement of emergency discharge, the Plant Manager shall follow the protocol as set out in Section 6.3.

4.1.3 Power Failure

If power failure is caused by a general power failure at the TSTP of STK STW or the district from the power company, relevant parties will be informed immediately.

In parallel, during the black-out period, suitable preventive measures as shown in the following diagram should be promptly implemented by the TSTP Operator.



As shown in the above figure, there are built-in preventive measures in the TSTP to avoid any emergency discharge of untreated or partially treated sewage from the TSTP due to power failure. Prolonged failure of these measures is highly unlikely. A remote control and monitoring system (SCADA) for all sewage treatment facilities in TSTP will be provided, allowing real time on-line monitoring to enable any implementation of any contingency measures and/or necessary repair works be initiated by the TSTP Operator and/or DSD at the earliest possible time in order to resume the plant operation in early stage. As the plant will be manned round-the-clock during the TSTP Operation Period, it is envisaged that any necessary responsive actions in emergency situations could be promptly initiated and completed within 6-hour emergency storage period of the Equalization Tank.

In case if the power failure lasts for longer than 6 hours and the temporary storage capacity is not enough, tanker service will be arranged to tanker-away excess pre-treated sewage to SWH STW.
In case of power failure, the Plant Operator should:

a) The Plant Operator to stop all of the site activities immediately.

b) The Plant Operator to turn off the TSTP main power supply and all of the equipment Miniature Circuit Breakers (MCBs).

c) The Plant Operator to hoist the warning sign “Power Failure” on the main control panel and to report to the person-in-charge of the TSTP.

d) The TSTP’s person-in-charge shall inform the Project Manager the power failure incident immediately.

e) The Plant Operator to arrange tankering away of sewage in the Inlet Pumping Station, if necessary. The amount of sewage that requires tanker-away shall be recorded. The Plant Operator shall liaise and inform SWHSTW in prior for the arrangement.

f) The Plant Operator to identify the cause and nature of the power failure, such as due to interruption of power supply from the power company or electrical equipment failure.

g) Arrange certified electrical technician to carry out rectification works if necessary.

h) When the problem of power failure is rectified, the Plant Operator to turn on the TSTP main power supply first. Then, turn on the equipment MCBs one-by-one to resume normal plant operation.

i) The Plant Operator to record details of the power failure and the corresponded actions taken in the logbook.

j) In case the power failure will likely affect the normal operation of the plant for a prolong period and lead to the requirement of emergency discharge, the Plant Manager shall follow the protocol as set out in Section 6.3.

4.1.4 Equipment Breakdown

In case of equipment breakdown, the Plant Operator should:

a) The Plant Operator to turn off the MCB of the failed equipment.

b) The Plant Operator to hoist the warning sign "Out of Service" to the failed equipment and to report to the person-in-charge of the TSTP.

c) The TSTP's person-in-charge shall inform the Project Manager the equipment breakdown incident immediately.

d) The Plant Operator to identify the cause of the equipment failure and rectify the problem accordingly.

e) Arrange competent technicians, if required, to carry out site inspection and necessary rectification works immediately in order not to affect normal plant operation.

f) When the problem is rectified, the Plant Operator to resume the equipment operation.

g) The Plant Operator to record details of the equipment failure and the corresponded actions taken in the logbook.

k) In case this equipment breakdown could not be rectified by running the standby unit and will likely affect the normal operation of the plant for a prolong period and lead to the requirement of emergency discharge, the Plant Manager shall follow the protocol as set out in Section 6.3.

4.1.5 Ingress of Abnormal Sewage

In case of ingress of "abnormal sewage", the Plant Operator should:

a) The Plant Operator to divert sewage to the Equalization Tank for temporary storage and to prevent feeding of abnormal (potentially toxic) sewage to the MBBR.

b) The Plant Operator to identify the source(s) and spilled quantity of abnormal sewage.

c) If possible, stop the spillage and prevent the abnormal sewage from entering the TSTP.

d) The Plant Operator to report the incident to the person-in-charge of the TSTP. Then, the person-in-charge shall inform the Project Manager the spillage incident immediately and to arrange necessary clean-up operations.

e) The Plant Operator to carry out Oxygen Utilization Rate (OUR) test to determine whether the abnormal sewage is inhibitory/toxic to the biological treatment process.

f) If the abnormal sewage is not inhibitory/toxic, the Plant Operator shall divert temporarily stored sewage in the Equalization Tank to the Inlet Pumping Station under flow control and to resume normal TSTP operation.

g) If the abnormal sewage is considered inhibitory/toxic, the Plant Operator shall arrange tankering-away of sewage. Closely monitor the OUR / Specific Utilization Rate (SOUR) until the test results are normal. Then, resume normal TSTP operation.

h) If the inhibitory/toxic effects are serious, the Plant Operator shall arrange TSTP re-seeding and process start-up. Inform the Project Manager and if necessary the Control Authority, i.e. EPD, the whole incident.

i) The Plant Operator to record details of the whole incident and the corresponded actions taken in the logbook.

Note: The meaning of "abnormal sewage" is sewage of characteristics significantly different from normal domestic sewage, which might contains inhibitory/toxic substance(s) of potentially adverse effects to the treatment process, particularly the biological process.

4.1.6 Non-compliance with EPD's Discharge Standard

Non-compliance with EPD's discharge standard may be occurred due to malfunction of the TSTP, i.e. power failure, equipment breakdown, ingress of abnormal sewage, etc., as mentioned above.

If the non-compliance is due to other reasons, the Chemist/Plant Operator shall investigate if it is due to problem(s) of process control. For example, sludge foaming / bulking, too long/short operating sludge age and abnormal mixed liquor pH. If necessary, the designer or process specialist shall be consulted for rectification.

It should be noted that following the operation and maintenance procedures as described in the O&M manual will minimize the risk of non-compliance with EPD's discharge standard.

If the non-compliance is occurred during the process commissioning stage of the TSTP, MBBR effluent will be diverted to the existing Oxidation Ditch activated sludge system for further treatment. The activated sludge process of the Oxidation Ditch system will be maintained during the TSTP process commissioning stage serving as contingency measure for treating TSTP effluent, if required. Treated effluent from the Oxidation Ditch system will be diverted to the existing UV channel for discharge.

If the non-compliance is occurred during the operation stage of the TSTP, a portion of MBBR effluent (say 50%) will be returned to the Inlet Pumping System for further treatment. Major effluent quality parameters, i.e. pH, TSS, NH_3-N and NO_3N will be closely monitored by the on-site laboratory and on-line instrumentation until satisfactory effluent quality can be achieved consistently for at least 24 hours before the TSTP is resumed to normal operation.

4.1.7 Emergency Sewage Overflow Arrangement

In case of emergency sewage overflow from the Inlet Pumping Station, the Plant Operator should:

a) The Plant Operator to stop all of the site activities immediately.

b) The Plant Operator shall check if there is any major equipment failure which caused suspension of duty Sewage Lift Pump in the Inlet Pumping Station. If it is found, try to fix the problem and resuming the operation of Sewage Lift Pump to stop the emergency sewage overflow immediately. When required, run the Sewage Lift Pump manually to divert sewage from the Inlet Pumping Station to the TSTP to control the overflow. Tankers may be arranged to further control the overflow, if necessary.

c) If the overflow is caused by excessive influent flow (i.e. during rainstorms), the Plant Operator shall station at site to ensure that the TSTP is operated normally until excessive influent is treated and no further overflow is occurred.

d) The Plant Operator shall report the incident of emergency sewage overflow to the person-in-charge of the TSTP.

e) The TSTP's person-in-charge shall inform the Project Manager the overflow incident immediately.

f) The Plant Operator shall check and rectify the TSTP for any damages. Then, to resume normal TSTP operation as soon as possible.

g) The Plant Operator to record details of the incident of emergency sewage overflow and the corresponded actions taken in the logbook.

h) The Plant Operator to identify the cause(s) of the emergency sewage overflow.

i) The Plant Operator to carry out necessary works to prevent further overflow.

j) In case the emergency sewage overflow from the Inlet Pumping Station will likely affect the normal operation of the plant for a prolong period and lead to the requirement of emergency discharge, the Plant Manager shall follow the protocol as set out in Section 6.3.

5.0 List of Water Sensitive Receivers in the Vicinity

5.1 The following Sensitive Receivers in the vicinity have been identified as per EIA Report and as per clause 5.2.8 of EM&A Manual for emergency discharge from TSTP:

- Fisheries (mariculturists) Sensitive Receivers
  Fish Culture Zones at Sha Tau Kok Fish Culture Zone – East [FZ1A (840892E, 844241N)], Sha Tau Kok Fish Culture Zone – West [FZ1B (841565E, 844299N)] and two of its potential relocation sites (FZ7, & FZ8) shown on the Fig. 5.1 of EM&A manual – "Water Sensitive Receivers near the Project" attached under Appendix III,
  Ap Chau (FZ2), Kat O (FZ3), O Pui Tong (FZ4), Sai Lau Kong (FZ5)
  and Wong Wan (FZ6)

- Ecological Sensitive Receivers

  Horseshoe crab at coastline off STKSTW (H1), off Pak Hok Lam (H2), off Nga Yiu Tau (H3), A Chau (H4) and off Luk Keng (H5);
  Mangrove stand at coastline off Nga Yiu Tau (M1), off Wu Shek Kok (M2), off Tai Wan (M3), off Luk Keng (M4), off Kuk Po (M5), Kei Shan Tsui (M6), Tai Sham Chung (M7), So Lo Pun (M8), Pak Kok Wan (M9), Yan Chau Tong Marine Park (M10, M11, M13 and M14) and Ngau Shi Wu Wan (M12).

- Seagrass Colony [SG (841099E, 844650N)]

5.2 In case there is emergency incident that may affect the mariculturists in the vicinity as listed above, we will inform immediately the Fisheries (mariculturists) Sensitive Receivers through the stakeholders namely: 沙頭角區鄉事委員會主席, HAD Liaison Officer (Sha Tau Kok), North DC Member, as listed in the Appendix II.

6.0 Response Procedure for Abnormal Incidents at Nearby Water body/Sensitive Receivers

In case there is abnormal incidents happened at the nearby water body/sensitive receivers that might be caused by emergency discharge from TSTP, we will conduct the investigation immediately upon receiving the notice from the stakeholders.

- Kingsford Environmental (HK) Ltd. (KEL) will check if there is any emergency incident in the operation of the sewage treatment plant, if yes we will rectify the malfunction immediately;
- KEL will arrange to take water samples at locations as per clause 5.2.8 of EM&A manual, and to be analyzed by the on-site Lab in the sewage treatment plant and report to EPD and all the stakeholders;
- The same water samples collected shall be sent to an HOKLAS Laboratory to carry out the required chemical analyses or microbiological tests and report will be submitted to EPD, Agriculture, Fisheries and Conservation Department (AFCD) and all the stakeholders;
- Assessment of the Impact at the nearby water body/sensitive receivers will be carried together with EPD, AFCD and all the stakeholders;
- Investigation on the cause of such abnormal incident will be jointly conducted together with EPD, AFCD and all the stakeholders;
- If after the joint investigation it is agreed that the abnormal incident is caused by the operation of the sewage treatment plants, KEL will propose a clean-up operation to the EPD for approval before implementation;
- KEL will also propose measure to prevent similar abnormal incident happens again in future;
- Joint Investigation with EPD, AFCD and the stakeholders will be conducted to determine the cause of fish kill/loss of fishery (if any);
- If it is proven that the fish kill/loss of fishery is caused by the abnormal operation of the sewage treatment plants, KEL will arrange to clean-up the affected fishery.

6.1 Responsibilities and Procedures for clean-up of the affected water body/sensitive receivers

(i) Upon verification that the polluted water body/sensitive receivers as listed in Clause 6.1 was caused by the operation of the TSTP, KEL shall be responsible to conduct cleaning up of the affected water body/sensitive receivers;

(ii) In order to draw up a clean-up plan, KEL will take water samples to be tested at an HOKLAS Laboratory at the affected water body/sensitive receivers at locations to be agreed with EPD, AFCD, the Project Manager (B&V), DSD/ST1, DSD/CM, BKKSJV, ET/IEC and the stakeholder(s) to determine the condition of the pollution;

(ii) Based on the results of the water sampling, assessment of the Impact at the nearby water body/sensitive receivers will be carried together with EPD, AFCD the Project Manager (B&V), DSD/ST1, DSD/CM, BKKSJV, ET/IEC and the affected stakeholders;

(iii) KEL together with BKKSJV, ET/IEC draw up a clean-up plan for the consent of EPD, AFCD the Project Manager (B&V), DSD/ST1, DSD/CM and the affected stakeholders.

(iv) Upon the consent from the stakeholders as stated in clause (iv) above, KEL shall organize and deploy all necessary resources including employing specialist contractor to carry out the agreed clean-up plan under the supervision of BKKSJV and monitoring of the Project Manager (B&V).

(v) Upon completion of the clean-up work, KEL shall arrange to take water samples to be tested at an HOKLAS Laboratory at the affected water body/sensitive receivers to confirm the effectiveness of clean-up work.

(vi) Based on the experience learnt from the incident, KEL will also propose measure to prevent similar abnormal incident happens again in future.

6.2 Investigation Arrangement of Incidents that affect nearby fish culture zone

(i) Upon happening of Incident that affect nearby fish culture zone, EPD, AFCD, the affected stakeholders, the Project Manager (B&V), DSD/CM, DSD/ST1, BKKSJV, ET/IEC will be notified.

(ii) KEL will arrange to take water samples at locations agreed by the stakeholders stated in (i) above and to be analyzed by the on-site Lab in the sewage treatment plant and report to EPD, AFCD and all the stakeholders, split sample of the same water sample will be sent to HOKLAS Laboratory for verification ;

(iii) Based on the results of the water sampling, incident site inspection and consultation with EPD, AFCD & ET/IEC, the impact on the nearby fish culture zone caused by the incidents will be studied which may include consulting third party independent environmental specialist if necessary;

(iv) Working closely with AFCD, EPD and third party fisheries specialist (if necessary) to investigate the cause of any fish kill/loss of fishery.

6.3 Emergency Discharge from TSTP

In case of emergency discharge from the TSTP is likely and unavoidable, EPD, the Project Manager (B&V), DSD/CM, DSD/ST1, BKKSJV, ET/IEC will be notified immediately.

KEL will adopt the following action protocol to deal with a likely emergency discharge event:

Stage leading to the likely emergency discharge	Action
If it is become apparent that the abnormal condition/malfunction of the TSTP cannot be rectified through operating the standby units, temporary storage in the EQ tank or repair in the foreseeable time frame (4 hours)	Report the likely emergency discharge incident to the Project Manager (B&V), BKKSJV, DSD/CM, DSD/ST1, ET/IEC
	Alert EPD (Regional office), AFCD and EPD, AFCD, the affected stakeholders including representatives of mariculturists the possibility of emergency discharge. The mariculturists may consider to relocate their fish raft to avoid the possibly deteriorated water quality during emergency discharge.
	Deploy a fleet of suction tankers to remove the sewage from TSTP to DSD SWHSTW for treatment if this can be arranged

ET shall be invited to arrange to carry out independent water quality monitoring of the emergency discharge according to Clause 5.2.22 of the EM&A Manual in response to and follow the requirement as stated in Section 5.9.11 of the approved EIA Report , i.e. " A follow-up water quality monitoring exercise shall also be conducted after every emergency discharge event to monitor the recovery of water quality."

During a follow-up water quality monitoring exercise after an emergency discharge event, DSD or its appointed agent shall inform the mariculturists, relevant stakeholders (e.g. Sha Tau Kok District Rural Committee) and relevant government departments (e.g. AFCD, EPD, MD) everyday on the latest results of the water quality monitoring exercise to allow these parties to make informed decisions. By the end of the follow-up water quality monitoring exercise, DSD or its appointed agent shall also inform these parties that no exceedance of the Action and Limit Levels has been recorded at all WSRs for two consecutive days to signal the recovery of water quality.

Appendix I

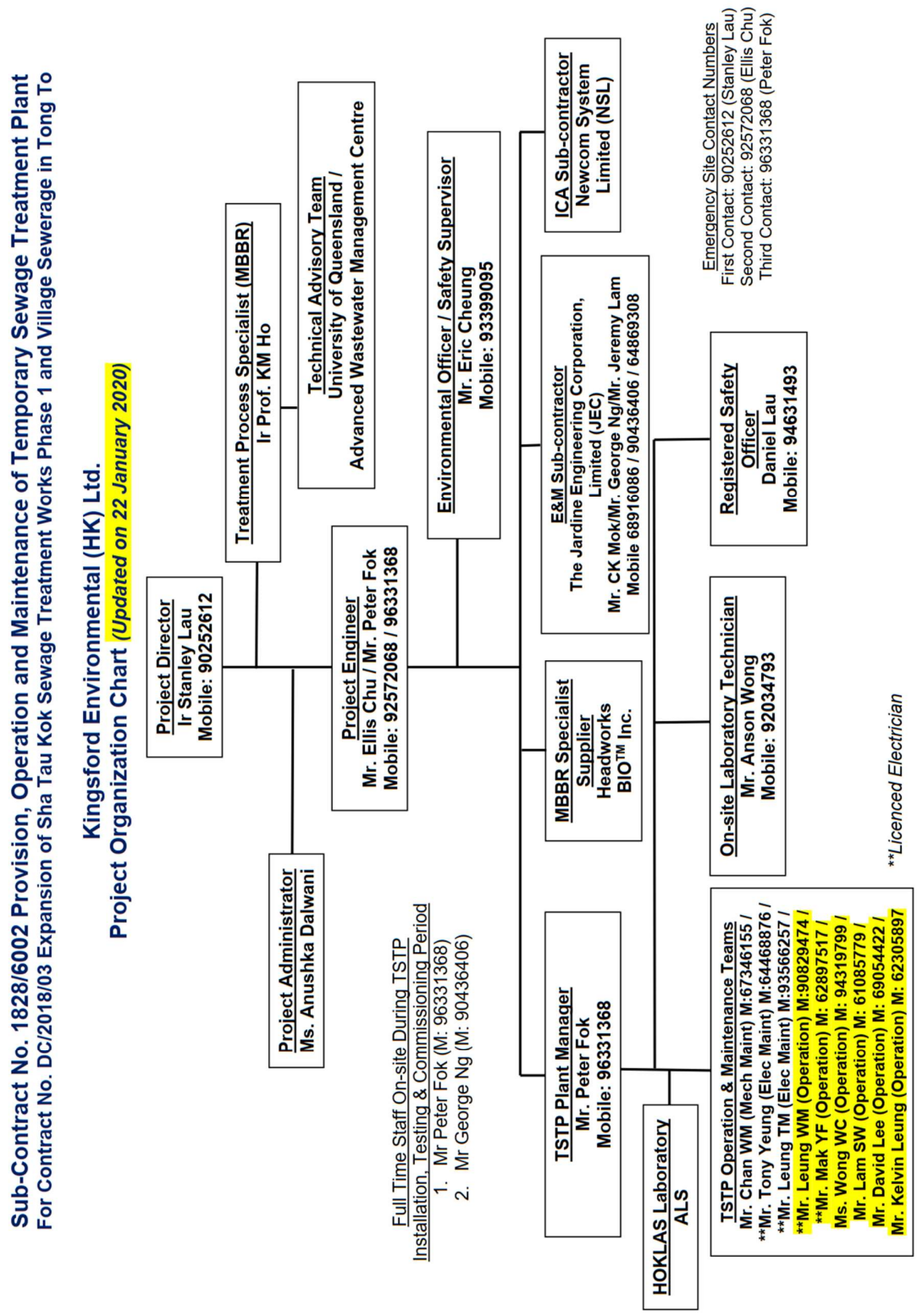
Emergency Contact List

BUILD KING - KUM SHING JV

合約號碼 : DC/2018/03 Contract No.: DC/2018/03

24 小時緊急事故應變/大亞灣應變小組名單 **24hrs Emergency Team / DBCP Member Contact List**	
小組成員 **(Team Member)**	聯絡電話**(Contact Tel.)**
洪秉賢 – 地盤主管 (Ron Hung – Site Agent) (RPOs)	6283 9181
范俊偉 – 助理地盤主管及緊急協調員 (Raymond Fan – Sub Agent and Emergency Coordinator)	6487 4488 / 6530 1973 (地盤熱線)
陳述文 – 地盤總管 (Chan Shut Man – Superintendent)	9830 3889
陳志球 – 管工 (Joseph, Chan Chi Kau– Site Foreman)	9189 3600
劉志雄 – 管工 (Lau Chi Hung– Site Foreman)	9783 8548
潘永健 – 安全主任/急救員 (Kan Poon – Safety Officer/ First Aider)	6144 1548
楊鍵華 – 安全主任/急救員 (Jack Yeung – Safety Officer/First Aider)	9382 8518
– 環保主任 (Jimmy Wong – Environmental Officer)	6576 7729
政府部門 (Government Department)	聯絡電話 (Contact Tel.)
香港警察 –沙頭角分區警署-石涌凹(Police –Shek Chung Au)	3661 1664
新界北交通部 (Police-RMO) 周 Sir	3661 3975
消防處拯救服務 (Fire Services Department - Rescue)	2723 2233
消防處急救車服務 (Ambulance)	2735 3355
勞工處 (Labour Department)	2717 1771
路政署 (Highway Department)	2926 4111
渠務署 (Drainage Services Department)	2300 1110
水務署 (Water Services Department)	2824 5000
環境保護署 (Environmental Protection Department)	2838 3111
食物及環境衛生署 (Food & Environmental Hygiene Department)	2868 0000
機電工程署 (Electrical and Mechanical Services Department)	2333 3762
海事處 (Marine Department)	2542 3711
漁農自然護理署 (Agriculture, Fisheries and Conservation Department)	2708 8885
政府一般查詢 (Government Hotline)	1823
香港海上救援協調中心 (Hong Kong Maritime Rescue Coordination Centre)	2333 7999
海事處海港巡邏組 (Harbour Patrol Section, Marine Department)	2385 2791 / 2385 2792
天文台天氣查詢 (Hong Kong Observatory Weather Enquiry)	1878 200
公用設施部門 (Public Facilities)	聯絡電話 (Contact Tel.)
中華電力有限公司 (CLP)	2728 8333
煤氣公司 (Town Gas)	2880 6988
電訊公司 PCCW	2888 2888

Rev 05 Updated on: Jul 2019


Sub-Contract No. 1828/6002 Provision, Operation and Maintenance of Temporary Sewage Treatment Plant
For Contract No. DC/2018/03 Expansion of Sha Tau Kok Sewage Treatment Works Phase 1 and Village Sewerage in Tong To
Kingsford Environmental (HK) Ltd.
Project Organization Chart (Updated on 22 January 2020)
Project Director
Ir Stanley Lau
Mobile: 90252612
Treatment Process Specialist (MBBR)
Ir Prof. KM Ho
Technical Advisory Team
University of Queensland / Advanced Wastewater Management Centre
Project Administrator
Ms. Anushka Dalwani
Project Engineer
Mr. Ellis Chu / Mr. Peter Fok
Mobile: 92572068 / 96331368
Environmental Officer / Safety Supervisor
Mr. Eric Cheung
Mobile: 93399095
ICA Sub-contractor
Newcom System Limited (NSL)
E&M Sub-contractor
The Jardine Engineering Corporation, Limited (JEC)
Mr. CK Mok/Mr. George Ng/Mr. Jeremy Lam
Mobile 68916086 / 90436406 / 64869308
Emergency Site Contact Numbers
First Contact: 90252612 (Stanley Lau)
Second Contact: 92572068 (Ellis Chu)
Third Contact: 96331368 (Peter Fok)
Full Time Staff On-site During TSTP Installation, Testing & Commissioning Period
1. Mr Peter Fok (M: 96331368)
2. Mr George Ng (M: 90436406)
TSTP Plant Manager
Mr. Peter Fok
Mobile: 96331368
MBBR Specialist Supplier
Headworks BIO™ Inc.
On-site Laboratory Technician
Mr. Anson Wong
Mobile: 92034793
Registered Safety Officer
Daniel Lau
Mobile: 94631493
HOKLAS Laboratory
ALS
TSTP Operation & Maintenance Teams
Mr. Chan WM (Mech Maint) M:67346155 /
**Mr. Tony Yeung (Elec Maint) M:64468876 /
**Mr. Leung TM (Elec Maint) M:93566257 /
**Mr. Leung WM (Operation) M:90829474 /
**Mr. Mak YF (Operation) M: 62897517 /
Ms. Wong WC (Operation) M: 94319799 /
Mr. Lam SW (Operation) M: 61085779 /
Mr. David Lee (Operation) M: 69054422 /
Mr. Kelvin Leung (Operation) M: 62305897
**Licenced Electrician

Appendix II

List of Bodies to be Informed for Emergency Incidents

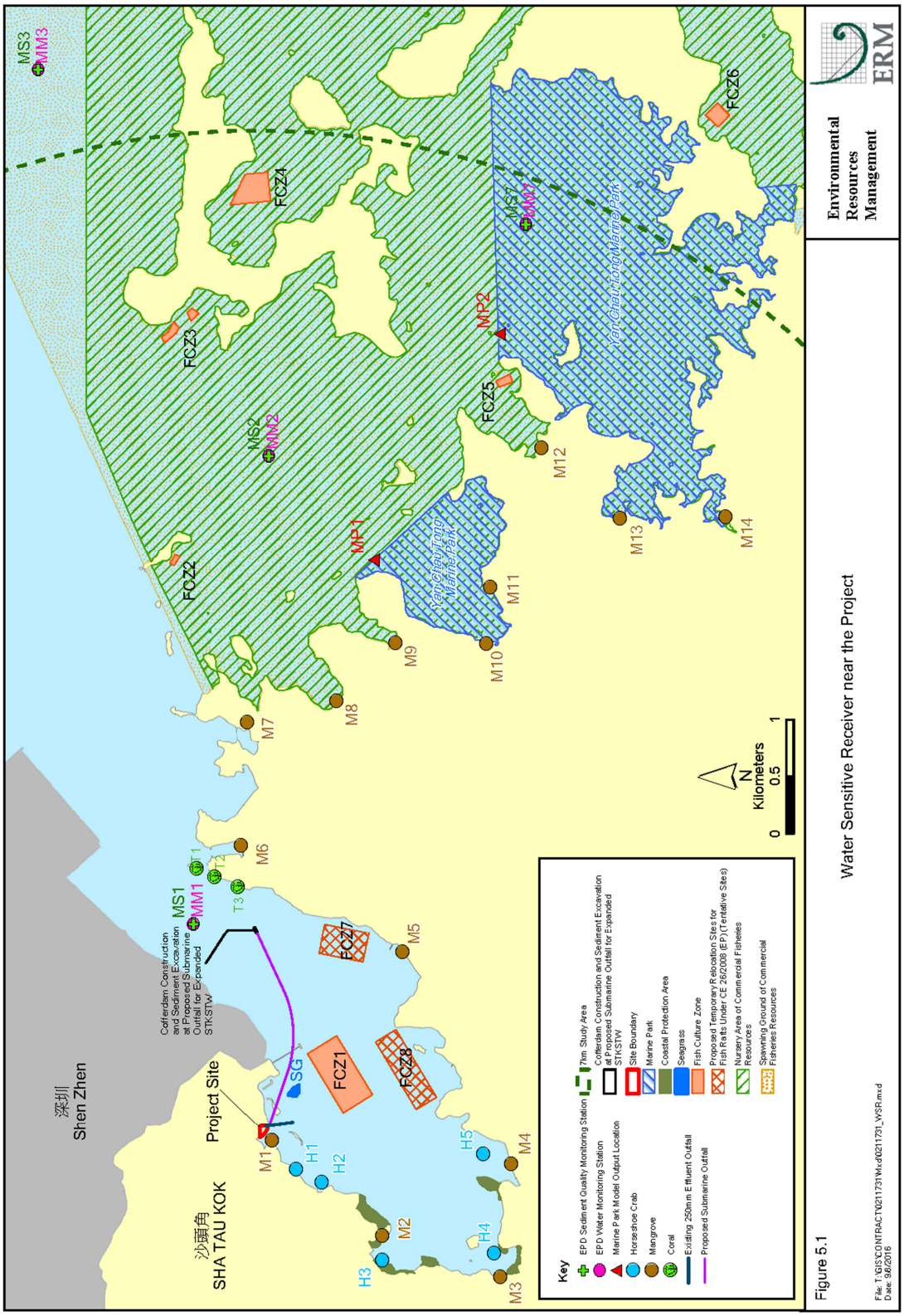
Contract No. DC/2018/03
Expansion of Sha Tau Kok Sewage Treatment Plant and Village Sewerage in Tong To
List of Stakeholders

姓名 Name	職位 Post	電話號碼 Tel No.
譚淬嵐 Ms TAM Sui Laam, Norma	民政事務處聯絡主任 (沙頭角) HAD Liaison Offr (Sha Tau Kok)	2675 1592
黃懷盛 Ms. WONG Wai Shing, Barbara	地政主任/土地徵用 1(北區地政處) LE/Acquisition 1, DLO/North	3692 4439 3692 4447 (Fax)
高維基 Mr. KO Wai Kei	北區區議會議員 North DC Member	2659 7322
李冠洪 Mr. LEE Koon-hung, MH	沙頭角區鄉事委員會主席 Chairman of Sha Tau Kok District Rural Committee	2674 1070 2674 0691 (fax)
李炳華 Mr. LEE Ping Wah	沙頭角區鄉事委員會首副主席	2674 1070 2674 0691 (fax)
嚴雪芳 Ms. Grace YIM	新界沙頭角區鄉事委員會 (秘書處) Secretary of Sha Tau Kok District Rural Committee	2674 1070 2674 0691 (fax)
李大貴 Mr. LEE Tai Kwai	沙頭角漁民代表 Representative of Fisherman in STK	95563323
蘇廸家 Mr. SO Tik Ka	沙頭角漁民代表 Representative of Fisherman in STK	98434959
徐勞來 Mr. TSUI Lo Loi	沙頭角墟西上村長 Resident Representative of STK Market (West Upper)	93500797

Name	Party	Tel No.:
Alaster Chan	B&V	9090 8713
Lawrence Yau	B&V	9091 9367
Ron Hung	BKKSJV	6283 9181
Gary Leung	DSD	9100 1533
Lemon Lam	Environmental Team	9630 8996
Adi Lee	Independent Environmental Checker	9469 7144

Appendix III

Location Plan of Water Sensitive Receivers


深圳
Shen Zhen
沙頭角
SHA TAU KOK
Project Site
Cofferdam Construction and Sediment Excavation at Proposed Submarine Outfall for Expanded STKSTW
MS1
MM1
T1
T2
T3
SG
FCZ1
FCZ2
FCZ3
FCZ4
FCZ5
FCZ6
FCZ7
FCZ8
MS2
MM2
MS3
MM3
MS7
MM7
MP1
MP2
Yan Chau Tong Marine Park
M1
M2
M3
M4
M5
M6
M7
M8
M9
M10
M11
M12
M13
M14
H1
H2
H3
H4
H5
Key
EPD Sediment Quality Monitoring Station
EPD Water Monitoring Station
Marine Park Model Output Location
Horseshoe Crab
Mangrove
Coral
Existing 250mm Effluent Outfall
Proposed Submarine Outfall
7km Study Area
Cofferdam Construction and Sediment Excavation at Proposed Submarine Outfall for Expanded STKSTW
Site Boundary
Marine Park
Coastal Protection Area
Seagrass
Fish Culture Zone
Proposed Temporary Relocation Sites for Fish Rafts Under CE 26/2008 (EP) (Tentative Sites)
Nursery Area of Commercial Fisheries Resources
Spawning Ground of Commercial Fisheries Resources
N
0
0.5
1
Kilometers
Water Sensitive Receiver near the Project
Figure 5.1
Environmental Resources Management
ERM
File: T:\GIS\CONTRACT\0211731\Wrk\0211731_WSR.mxd
Date: 9/6/2016