.

Expansion of Shek Wu Hui Sewage Treatment Works

Second Quarterly EM&A Report

(Mar 06 – May 06)

June 2006

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Second Quarterly EM&A Report (Mar 06 – May 06)

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Contents

List of Tables

List of Appendices

1 Executive Summary

The expansion of Shek Wu Hui Sewage Treatment Works (SWHSTW) aims to increase the treatment capacity of the existing SWHSTW to cope with the increasing wastewater flows and loads as a result of the population growth in the catchment area of Fanling/Sheung Shui and the committed extension of sewerage system to unsewered areas. It is considered as a project constituting a material change to an exempted designated project under Schedule 2 of EIAO. Thus, the procedures under the EIAO have been followed and an Environmental Monitoring and Audit (EM&A) Programme has to be carried out. The present report documents the outcomes of the EM&A Works undertaken between March and May 2006.

Breaches of Action and Limit Levels

Noise

No non-compliance of action/limit level was recorded at all monitoring stations for noise during the reporting period.

1-hr TSP

No non-compliance of action/limit level was recorded at all monitoring stations for 1-hr TSP during the reporting period.

24-hr TSP

No non-compliance of action/limit level was recorded at all monitoring stations for 24-hr TSP during the reporting period.

Complaints Log

During this reporting period, no environmental complaint was received.

Notifications of Any Summons and Successful Prosecutions

During the reporting period, no notification of summons or successful prosecution was recorded.

Reporting Changes

There was no reporting change during the reporting period.

Future Key Issues

The construction activities for the coming three months will include the construction of mini piles, cable/ utilities diversion, relocation of $FeCl_3$ tank, excavation, pile cap construction, sheet piling work, sub-structure and superstructure construction, pipe works and internal/ external finishing.

2 Introduction

2.1 Basic Information

Shek Wu Hui Sewage Treatment Works (SWHSTW) provides treatment to the wastewater generated from Fanling/Sheung Shui areas before discharge it into Mai Po Inner Deep Bay Ramsar Site through River Indus and Shenzhen River, thus helps protecting the water quality of River Indus, Shenzhen River and Mai Po Inner Deep Bay Ramsar Site. The expansion of SWHSTW aims to expand the treatment capacity of the existing SWHSTW to cope with the increasing wastewater flows and loads as a result of the population growth in the catchment area of Fanling/Sheung Shui and the committed extension of sewerage system to unsewered areas.

In accordance with Section 9(2)(g) of the Environmental Impact Assessment Ordinance (EIAO), the SWHSTW is an exempted designated project as the existing SWHSTW has been in operation before the EIAO came into effect on 1 April 1998. However, since the proposed works involve physical expansion and alternation to the existing SWHSTW (hereafter called "the Project") and may cause adverse environmental impacts if mitigation measures are not in place, it shall be considered as a project constituting a material change to an exempted designated project under Schedule 2 of EIAO. Hence the procedures under the EIAO have been followed. A Project Profile (PP) for direct application of the EP (Application No.DIR-121/2005) was approved by Environmental Protection Department (EPD) in May 2005 and an environmental permit (EP-218/2005) was obtained prior to the commencement of the expansion works.

Drainage Services Department (DSD) awarded the civil contract of the expansion of SWHSTW to Maeda Corporation (Maeda) in September 2005. Maeda appointed Hyder Consulting Limited (HCL) as the Contractor's Environmental Team (ET) during the construction period. CH2M-IDC Hong Kong Limited is the independent environmental checker (IEC). The construction contract commenced in September 2005 and the total construction period is approximately 36 months. The notified commencement date of work to the Director of EPD is 14 December 2005.

2.2 Management Structure and Project Organisation

The Engineer (DSD) is responsible for overseeing the construction works and ensuring that they are undertaken by the Contractor (Maeda) in accordance with the specification and contractual requirements. The Contractor shall report to the Engineer. The ET is employed by the Contractor and is responsible for conducting the EM&A programme. The IEC shall advise the Engineer on the environmental issues related to the Project.

The key personnel contact names and telephone number are summarised in Table 2-1. The project organisation is shown in Appendix 1.

Party	Position	Name	Telephone number
Project Proponent - DSD	Project Manager	Raymond Lee	2594 7457
	Engineer's Representative	Tim Tsoi	2594 7460
Contractor - Maeda	Site Agent	George Cheung	9268 1918
ET - Hyder	ET Leader	Sharifah Or	2911 2730
IEC – CH2M HILL	IEC	David Yeung	2872 2934

Table 2-1 Key Personnel Contact Names and Telephone Number for the Project

2.3 Construction Programme

Construction programme of the Project is attached in Appendix 2.

2.4 Works Undertaken during the Reporting Quarter

Works undertaken during the reporting period included:

- Construction of permanent pile
- Cable / utilities division
- Set up of loading tests for the piles
- Excavation works
- Loading tests for the piles
- Relocation of $FeCl_3$ tank
- Post-drilling
- Construction of bund wall of $FeCl_3$ tank
- Construction of chemical waste storage area

2.5 Status of Environmental Permit/ Licence

The status of the Environmental Permit/Licence for the Project is shown below.

Permit/Licence	Application Date	Date of issue	Ref. No.	Valid Until
Environmental Permit	21 May 2005	16 June 2005	EP-218/2005	N/A
Notification was made to EPD pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation (Form NA was submitted)	22 Sep 2005	N/A	N/A	N/A
Registration as a chemical waste producer	26 Sep 2005	4 Nov 2005	WPN: 5213-624-M2446-06	N/A

Permit/Licence	Application Date	Date of issue	Ref. No.	Valid Until
Effluent Discharge Licence	11 Nov 2005	20 Dec 2005	Licence No.: W5/1I287/1	19 Dec 2010
Application for Exemption Account for Disposal of Construction Waste	12 Dec 2005	Approved by EPD on 31 Dec 05	Application No.: RN/00134	25 Sep 2008

Table 2-2 Status of Permit/Licence for the Project

3 Environmental Status

3.1 Project and Work Area, Environmental Sensitive Receivers and Monitoring Locations

The site is located at the existing Shek Wu Hui Sewage Treatment Plant, next to Chuk Wan Street. It has been subdivided into different Works Areas/Portions as illustrated in Appendix 3. Project area, environmental sensitive receivers and monitoring locations are shown in Appendix 4.

4 Brief Summary of EM&A Requirements

4.1 Monitoring Parameters

4.1.1 Air Quality

During the construction phase impact monitoring, 1-hour and 24-hour Total Suspended Particulates (TSP) levels should be measured at the selected air monitoring locations in accordance with the EM&A Manual. These two parameters are aimed to indicate the impacts of construction dust on air quality.

4.1.2 Noise

The construction noise level should be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}) for 30 minutes. $L_{eq(30\ min)}$ is used as the monitoring parameter for the period between 0700 and 1900 hours on normal weekdays. For all other time periods, three consecutive $L_{eq(5min)}$ are employed for comparison with the Noise Control Ordinance (NCO) criteria.

Other noise parameters such as L_{10} and L_{90} should also be obtained for reference.

4.2 Action and Limit Levels

4.2.1 Air Quality

The baseline monitoring results documented in the Baseline Monitoring Report for the Project (our report ref.: EA01284R0012) form the basis for derivation of the Action and Limit Levels for air quality impact monitoring. Appendix 5 shows the derived Action and Limit Levels for the Project. If the air quality criteria are exceeded due to the Project, the Event/Action Plan summarised in Table 4-3 should be triggered immediately.

4.2.2 Noise

The Action and Limit Levels for construction noise are defined in Appendix 5. If valid non-compliance of the criteria occurs, actions in accordance with the Event and Action Plan in Table 4-4 should be implemented. If construction works are undertaken during the restricted hours, a construction noise permit under NCO shall be obtained by the Contractor.

4.3 Event and Action Plans

The Event and Action Plans for air quality and noise monitoring are shown in Tables 4-3 and 4-4, respectively.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform IEC and ER; • Repeat measurement to confirm finding.	• Check monitoring data submitted by ET; • Check Contractor's working method.	• Notify Contractor.	• Rectify any unacceptable practice; • Amend working methods if appropriate.
Exceedance for two or more consecutive samples	• Identify source, investigate the cause of exceedance and propose remedial measures ; • Inform IEC and ER; • Advise ER on the effectiveness of the proposed remedial measures; • Repeat measurements to confirm findings;	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ET on the effectiveness of the proposed remedial measures;	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • Ensure remedial measures properly implemented.	• Submit proposals for remedial to ER within 3 working days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	• Increase monitoring frequency to daily; • Discuss with IEC and Contractor on remedial actions required; • If exceedance continues, arrange meeting with IEC and ER; • If exceedance stops, cease additional monitoring.	• Supervise Implementation of remedial measures.		
LIMIT LEVEL				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform IEC, ER, Contractor and EPD; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. • If exceedance stops, cease additional monitoring.	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise ER on the effectiveness of the proposed remedial measures; • Supervise implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • Ensure remedial measures properly implemented.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.
Exceedance for two or more consecutive samples	• Notify IEC, ER, Contractor and EPD; • Identify source, investigate the cause of exceedance and propose remedial measures; • Repeat measurement to confirm findings; • Increase monitoring frequency to daily; • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; • Arrange meeting with IEC and ER to	• Discuss amongst ER, ET, and Contractor on the potential remedial actions; • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly; • Supervise the implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Ensure remedial measures properly implemented; • If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Resubmit proposals if problem still not under control; • Stop the relevant portion of works as determined by ER until the exceedance is abated.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	discuss the remedial actions to be taken; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; • If exceedance stops, cease additional monitoring.		until the exceedance is abated.	

Table 4-3 Event/ Action Plan for Air Quality Monitoring

EVENT	Action			
	ET	IEC	ER	CONTRACTOR
Action Level	• Notify IEC and ER; • Carry out investigation; • Report the results of investigation to the IEC, ER and Contractors; • Discuss with the Contractor and formulate remedial measures; • Increase monitoring requrency to check mitigation effectiveness.	• Review the analysed results submitted by the ET; • Review the proposed remedial measures by the Contractor and advise the ER accordingly; • Supervise the implementation of remedial measure.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • Require Contractor to propose remedial measures for the analysed noise problem; • Ensure remedial measures are properly implemented.	• Submit noise mitigation proposal to IEC; • Implement noise mitigation proposals.
Limit Level	• Identify source; • Inform IEC, ER, EPD and Contractor; • Repeat measurements to confirm findings; • Increase monitoring frequency to check mitigation effectiveness; • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; • Inform IEC, ER and EPD the causes and actions taken for the exceedances; • Assess effectiveness of Contractor's remedial actions and	• Discuss amongst ER, ET, and Contractor on the potential remedial actions; • Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; • Supervise the implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • Require Contractor to propose remedial measures for the analysed noise problem; • Ensure remedial measures properly implemented; • If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Resubmit proposals if problem still not under control; • Stop the relevant portion of works as determined by th ER until the exceedance is abated.

EVENT	Action			
	ET	IEC	ER	CONTRACTOR
	keep IEC, EPD and ER informed of the results; • If exceedance stops, cease additional monitoring.			

Table 4-4 Event/ Action Plan for Noise Monitoring

4.4 Environmental Mitigation Measures and Requirements

The recommended measures for mitigating air quality, water quality, noise, waste and all other possible environmental impacts due to the construction works have been stated clearly in the EM&A Manual. The details of the measures implemented by the Contractor are shown in Appendix 6.

5 Implementation Status of Environmental Protection and Pollution Control/ Mitigation Measures

The status of the mitigation measures implemented by the Contractor is listed in Appendix 6.

6 Monitoring Results

6.1 Graphical Plots of Monitoring Parameters

Graphical plots of the monitoring results are summarized in Appendix 7.

6.2 Factors Which Might Affect the Monitoring Results

Dust from other sources such as roads with the movement of heavy vehicles in the vicinity of the monitoring stations would affect the air quality monitoring results.

7 Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions

7.1 Non-compliance of Action and Limit Levels

No non-compliance of Action or Limit Level was recorded for air quality and noise monitoring.

7.2 Complaints Received

In case of an environmental complaint received, all related parties should follow the complaints response procedures specified in the EM&A Manual.

During this reporting quarter, no environmental complaint was received. Cumulative number of environmental complaint is shown in Appendix 8.

7.3 Notifications of Summons and Successful Prosecutions

No notification of summons or successful prosecution was recorded during the reporting period. The cumulative number of notifications of summons and successful prosecutions are shown in Appendix 8.

7.4 Review of the Reasons and Implications of Non-compliance, Complaints, Summons and Prosecutions

7.4.1 Non-compliance of Acton/Limit Level

No non-compliance was recorded during the reporting period.

7.4.2 Complaints, Summons and Prosecutions

No complaints, summons and prosecutions were recorded during the reporting period.

7.5 Site Inspections

Weekly site inspections have been carried out during the reporting period. The findings of the site inspections and appropriate mitigation measures were recorded in the site inspection checklists. The observations raised during the site inspections, corresponding recommendations and rectification status are summarised in Table 7-5.

Inspection Date	Deficiencies	Recommendation	Status	Note / Reminder
1-Mar-06	1. Drip tray in portion 2 was full of water. 2. Not enough protection to manhole near wheel washing bay was provided. 3. The discharge point at portion 2 was silty.	1. Prompt removal works was recommended and oily water in drip tray should be treated as chemical waste. 2. The manhole cover should be sealed to prevent wastewater from entering. 3. The removal of silty	1. Water in drip tray was removed as observed on 16 March. 2. The manhole was sealed as observed on 7 March. 3. No silty water was observed at the discharge point as observed on 7 March.	1. The contractor was reminded to inspect and maintain the wastewater treatment system after rainstorm.

Inspection Date	Deficiencies	Recommendation	Status	Note / Reminder
		water and mud is required and the quality of discharge should be closely monitored.		
7-Mar-06	1. There were debris and mud at the exit of Portion 2. It was also observed that part of the haul road leading to the exit was not paved. 2. The drip trays for generators at Portion 2 were full of water.	1. The Contractor was recommended to remove the debris and mud and to pave the haul road to avoid the vehicles bringing mud onto public roads. 2. The Contractor was reminded to remove the water.	1. The debris at the site exit was removed and the haul road was paved with metal plate as observed on 16 March. 2. The water in the drip tray for generator was removed as observed on 16 March.	1. It was observed that wastewater was pumped into the final portion of settling tank. The retention time was reduced and therefore affect the performance of the settling tank. The Contractor was recommended to improve the design of the settling tanks.
16-Mar-06	1. The door of chemical store blocked by cement bags was observed at Portion 2. 2. The works area at Portion 1 was not covered properly.	1. The entrance of chemical store must be kept clear for easy access and the cement bags should be properly covered with tarpaulin sheet. 2. The area should be covered by tarpaulin sheet to prevent soil and mud deposited outside the works boundary.	1. The cement bags have been properly covered with tarpaulin sheet and the entrance of chemical store was cleared for entrance as observed on 22 March. 2. The works area at Portion 1 has been properly covered with tarpaulin sheet as observed on 22 March.	N.A.
22-Mar-06	1. Oil bucket without drip tray provided was observed.	1. Provision of drip tray was required.	1. The oil bucket was removed as observed on 29 March 2006.	1. A drilling rig operating with cover opened was observed at Portion 2. The Contractor closed the cover immediately. 2. There was stagnant water under the mixer at Portion 2 and in the channel at Portion 3. The Contractor was reminded to inspect it and apply larvicide to it after rainstorm.
29-Mar-06	1. Water barrier without cap was observed at portion 2. 2. Cleaning up of muddy water on public road was observed at portion	1. The cap should be provided to prevent mosquito breeding. 2. Prompt mitigation measures are required to prevent muddy water	1. The inlet of water barrier was sealed as observed on 6 April 2006. 2. Muddy water on the road section near	N.A.

Inspection Date	Deficiencies	Recommendation	Status	Note / Reminder
	3. 3. Waste cement bag was observed at portion 3.	overflowing on the public road during rainy season. 3. Prompt removal of cement bag is required.	Portion 3 was not observed on 6 April 2006. 3. Waste cement bag was removed as observed on 6 April 2006.	
6-Apr-06	4. Oil container without drip tray was observed near wheel washing bay, sedimentation tanks and WetSep at Portion 2. 5. The drip tray for air compressor (AR5) was full of oily water at Portion 2. 6. The manhole near the slaughterhouse was not sealed at Portion 2. 7. Stockpiles of soil were not covered at Portion 3.	1. Drip tray should be provided or the container should be removed. 2. Prompt removal was needed. 3. The manhole should be sealed. 4. The soil should be covered with tarpaulin.	4. Oil containers were removed as observed on 10 April 2006. 5. The situation was rectified as observed on 10 April 2006. 6. The manhole was sealed as observed on 10 April 2006. 7. The stockpiles of soil were covered with tarpaulin as observed on 10 April 2006.	1. The Contractor reported that larvicide had been applied for the sump pits and stagnant water. It was recommended that larvicide should be applied regularly and stagnant water should be removed as far as possible. 2. Grouting works were undertaken. Wastewater from grouting works is high in pH value. The wastewater from treatment plant should be tested before discharge, to ensure the compliance of Effluent Discharge Licence requirements.
10-Apr-06	3. It was observed that there was contaminated water inside the drip tray for a generator at Portion 2. 4. A stockpile of soil was found uncovered at Portion 3.	3. The Contractor was recommended to remove the contaminated water and dispose of it as chemical waste. 4. The Contractor was reminded to provide cover for the stockpiles.	3. The drip tray and generator at Portion 2 has been removed from site as observed on 19 April 2006. 4. The stockpile of soil was properly covered with tarpaulin sheet as observed on 19 April 2006.	1. There were stockpiles of soil at Portion 3. The Contractor was recommended to remove them before rain to avoid silty water leaking outside the site boundary. 2. It was observed that the wastewater was washed onto the haul road at Portion 2. The Contractor was recommended to pump the wastewater into the sedimentation tank for treatment.
19-Apr-06	No observation.	N.A.	N.A.	1. Stagnant water was observed near the Contractor site office.

Inspection Date	Deficiencies	Recommendation	Status	Note / Reminder
				Larvicide should be applied to prevent mosquito breeding. 2. Stagnant water was observed in trench at Portion 2 near site exit. Stagnant water should be drained after rain and larvicide should be applied to the remaining water.
25-Apr-06	2. An oil drum on bare ground was observed at Portion 2.	1. The provision of drip tray is required.	1. The oil drum was removed as observed on 3 May 2006.	1. Standing water was observed at several areas. The Contractor was reminded to inspect and maintain the mosquito controlling measures after rainstorms.
3 May 06	1. Silty water overflowing onto the DSD road was observed.	1. The Contractor was requested to carry out mitigation measures to avoid silty water entering the storm drain.	1. Concrete bund was constructed to prevent muddy water overflowing into the drain on the DSD road.	1. Due to the heavy rainstorm in the morning, stagnant water was observed at several areas. The Contractor was reminded to inspect and maintain both the surface channels and mosquito control measures after rainstorms.
8 May 06	1. There was no preventive action provided for the gullies at Portion 2 to avoid sand/silt washing into the drainage system. 2. There was a potential of mosquito breeding inside the wheel washing bay at Portion 3.	1. The Contractor was recommended to provide sand bags around the gullies. 2. The Contractor was recommended to provide larvicide for the stagnant water.	1. The gullies at Portion 2 were sealed by concrete as observed on 17 May 2006. 2. Larvicide was applied to the wheel washing bay and recycling of stagnant water was observed during the inspection on 17 May 2006.	N.A.
17 May 06	1. There was not enough protection for the gullies at Portion 2. Silty water would potentially enter the storm drains.	1. The Contractor was reminded to provide more sand bags and replace the broken sand bags to protect the drains.	1. The protection of gullies at Portion 2 was improved by providing more sand bags surrounding the gullies as observed on 26 May 2006.	1. The Contractor was reminded to inspect and maintain the mosquito and sediment control after rainstorm.

Inspection Date	Deficiencies	Recommendation	Status	Note / Reminder
26 May 06	1. Water was observed in drip tray at the storage area near site office. 2. Stagnant water was observed on tarpaulin sheet at the storage area near the site office.	1. The Contractor was reminded to remove the water in drip tray. 2. The Contractor was reminded to remove the stagnant water.	1. Water in drip tray was drained as observed on 1 June 2006. 2. Stagnant water was removed as observed on 1 June 2006.	N.A.

Table 7-5 Summaries of Site Inspections and Recommendations

EPD conducted site visit on 29 May 2006 and inspected the effluent discharge, the chemical storage area and the ticket of chemical waste collection. They noted that the concrete cover for sealing two gullies at Portion 2 was broken and no muddy water was discharged to the gullies at the time of inspection. They recommended the Contractor to seal the gullies to avoid muddy water discharge.

8 Waste Management Status

According to the information provided by the Contractor, Table 8-5 shows waste materials were generated during the reporting period.

Type of Waste	Mar 06	Apr 06	May 06
Inert C&D material (m^3)	630.5	3458	2338
General Refuse (m^3)	52	143	52
Chemical waste (L)	0	0	20

Table 8-6 The Quantity of Waste Generation

Inert C&D materials were disposed of at Tuen Mun Area 38 public fill. General refuse was collected and disposed of at NENT Landfill. Chemical waste was produced and collected by licensed chemical waste collector in May 2006. Trip ticket system was implemented and disposal records were in order on site. The Waste Management Plan was followed.

9 Comments, Recommendations and Conclusions

EM&A works have been undertaken between March 2006 and May 2006 for the Project based on the requirements set in the EM&A Manual.

All monitoring equipments have been calibrated and all monitoring protocols have been carried out properly according to the EM&A Manual.

No valid exceedance of Action/Limit Level was recorded during the reporting period.

No compliant, notification of summons or successful prosecution was recorded during the reporting period.

The overall EM&A programme is considered efficient during the reporting period and no material and technical changes are considered necessary.

Appendix 1

Project Organization

Appendix 2

Construction Programme

Appendix 3

Works Area

Appendix 4

Project Area, Environmental Sensitive Receiver and Monitoring Location

Appendix 5

Action and Limit Levels

Appendix 6

Environmental Requirements and Implementation Status

Appendix 7

Monitoring Results and Graphical Plots

Appendix 8

Cumulative Statistics of Complaint, Notification of Summons and Successful Prosecution