



**CONTRACT NO: DC/2001/09**

**SAN TIN EASTERN MAIN DRAINAGE CHANNEL**

**ENVIRONMENTAL MONITORING & AUDIT  
QUARTERLY REPORT**

**- JAN – MAR 2006 -**

**CLIENT:**

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**CERTIFIED BY:**

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Raymond Dai  
Environmental Team Leader

**DATE:**

27 Apr 2006



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*Hyder Consulting Limited is incorporated in Hong Kong with limited liability.  
COI Number 126012*

24 April 2006

**BY POST & FAX (2897 5509)**

Lam Environmental Services Ltd  
Rm 2603 Honour Industrial Centre  
6 Sun Yip Street  
Chai Wan  
Hong Kong

Your  
Ref:

Our 987-07/E06-22224  
Ref:

For attention of: Mr. Raymond Dai

Dear Raymond

**Contract No. DC/2001/09  
San Tin Eastern Main Drainage Channel  
Quarterly EM&A Report for January to March 2006**

I refer to the softcopy of the captioned report received on 9 April 2006 and the subsequent revision on 21 April 2006. We do not have further comment and we endorse the report.

Yours sincerely

**Dr Gulyi Li  
Project Manager  
HYDER CONSULTING LIMITED**

cc DSD – Gary Yip  
Hsin Chong – Keniel Kwong

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### **EXECUTIVE SUMMARY**

This is the Quarterly Environmental Monitoring and Audit (EM&A) report for Jan-Mar 2006 under DSD Contract No.: DC/2001/09 – San Tin Eastern Main Drainage Channel. This report presents the environmental monitoring and auditing (EM&A) findings based on data and information recorded from the period 1<sup>st</sup> Jan to 31<sup>st</sup> Mar 2006.

#### Construction Activities for the Reported Period

During this reporting period, the principal work activities include:

<b>Location</b>	<b>Construction Works</b>
Section 8	<ul style="list-style-type: none"><li>• Geotechnical Instrument Monitoring</li><li>• Water main and drainage installation on west embankment</li><li>• Embankment filling</li><li>• Main Channel Formation Setting, Toe Block construction and grasscrete laying</li><li>• Kerb laying and Road Works Construction</li><li>• R.E. Wall Construction</li><li>• Main Channel Construction</li><li>• Embankment Filling</li></ul>
Section 9	<ul style="list-style-type: none"><li>• Geotechnical Instrument Monitoring</li><li>• Water main and drainage installation on west embankment</li><li>• Main Channel Formation Setting, Toe Block construction and grasscrete laying</li><li>• R.E. Wall Construction</li><li>• XPM Mesh Installation</li><li>• Embankment Construction</li><li>• Coping Construction</li><li>• Road Works Construction</li></ul>
Section 10	<ul style="list-style-type: none"><li>• General fill filling for formation of structure</li><li>• Geotechnical Instrument Monitoring at Storage Pond</li><li>• Storage Pond Construction</li><li>• Wetland Construction</li></ul>



#### Air Quality Monitoring

15 occasions of 24-hr monitoring and 48 occasions of 1-hr monitoring of Total Suspended Particulates (TSP) were conducted at the monitoring stations AM1. 1 Limit Level exceedances and 2 Action Level exceedances for 24-hr TSP monitoring while 6 Limit Level exceedances and 1 Action Level exceedances for 1-hr TSP monitoring were recorded in this reporting period.

6 exceedances of 1-hr TSP were confirmed to be due to DC/2001/09 activities. Implementation of dust suppression measures has been reviewed and contractor was reminded to maintain the dust suppression at all times, especially during the dry weather period.

Other non-valid exceedances were investigated and found to be due to local weather impairing the air quality. Such results indicate air impact was kept minimal and DC/2001/09 contractor needs to further effort to minimize dust suppression in dry weather.

#### Noise Monitoring

15 occasions of daytime and night-time noise monitoring and 13 occasions of holiday noise monitoring were carried at the monitoring station NM1(A). There was no valid exceedance reported during the reported period.

#### Water Quality Monitoring

No water quality monitoring event was carried out during the reporting period. During dry season, no successful water sample was taken at all water quality monitoring events due to low water level. Further to recent liaison between the police and the contractor, access to water quality monitoring stations could be arranged, thus alternative water monitoring station suggested in February 2006 was regarded as unnecessary.

#### Waste Management

During this reporting period, 387 ton C&D material was generated from the works. No treated soil was disposed at Tuen Mun Area 38. 13.5ton general refuse was disposed to landfill. No chemical waste was collected by a licensed collector.

#### Complaints, Notifications of Summons and Successful Prosecutions

There was no complaints, notification of prosecutions or summons in this reporting period.



## **1 INTRODUCTION**

### **1.1 SCOPE OF THE REPORT**

Effective from 1 September 2005, Lam Environmental Services (LAM) has been appointed by Hsin Chong Construction to work as the Environmental Team (ET) to implement the Environmental Monitoring and Audit (EM&A) programme for DSD Contract No. DC/2001/09 – San Tin Eastern Main Drainage Channel.

This report presents the environmental monitoring and auditing work carried out in accordance to the “*Main Drainage Channels and Poldered Village Protection Scheme for San Tin, NWNT: Environmental Impact Assessment Study, Environmental Monitoring and Audit Manual*” during the period 1<sup>st</sup> Jan to 30<sup>th</sup> Mar 2006 previously conducted by Stanger Asia Limited.

The following information relating to this project is documented in the EM&A Manual and, to avoid duplication, it is not presented in detail within the Quarterly report.

- Event-Action Plans;
- Full set of environmental mitigation measures and;
- Contracted environmental requirements.

### **1.2 STRUCTURE OF THE REPORT**

**Section 1**      **Introduction** – details the scope and structure of the report.

**Section 2**      **Project Background** – summarizes background and scope of the project, site description, project organization and contact details of key personnel, construction programme and works undertaken during the reporting period.

**Section 3**      **Implementation Status** – summarizes the status of Environmental Permits / Licenses, implementation of environmental protection and pollution control / mitigation measures in an updated schedule for the reporting period.

**Section 4**      **Monitoring Requirements** – summarizes all monitoring stations, parameters, frequency and quality performance limits.



**Section 5**      ***Quarterly Review of Monitoring Results*** – summarizes the status and review of monitoring, compliance, graphical plots of trends and waste management status in the reporting period.

**Section 6**      ***Complaints, Notification of Summons and Prosecution*** – summarizes the complaints, notification of summons and successful prosecution for breaches of environmental legislation and the actions taken within the reporting period.

**Section 7**      ***Conclusion and Recommendations***

## 2 PROJECT BACKGROUND

### 2.1 SCOPE OF THE PROJECT AND SITE DESCRIPTION

The construction works under contract no. DC/2001/09 mainly comprise the removal and disposal of contaminated materials, the construction of a reinforced concrete channel, footpaths, drainage works, roadworks, water and landscape works from the Castle Peak Road at San Tin to the Shenzhen River some 2.5km downstream.

The site layout plan is shown in [Figure 2.1](#).

### 2.2 PROJECT ORGANIZATION AND CONTACT PERSONNEL

Under the organization chart, Resident Engineer, Contractor, Independent Environmental Checker, Environmental Team are appointed to manage and control environmental issues for the construction phase of DC/2001/09. Overall responsibilities and duties of the team are found in the corresponding EM&A Manual. Key personnel and contact particulars are summarized in **Table 2.2**:

The organization chart for the EM&A programme is attached in [Appendix A](#).

**Table 2.2 Contact Details of Key Personnel**

Post	Name	Contact No.	Contact Fax	E-mail
Environmental Protection Officer	Ms. Pauline Choi	2835 1847	2591 0558	<a href="mailto:paulinechoi@epd.gov.hk">paulinechoi@epd.gov.hk</a>
Engineer's Representative	Ir. C.L. Leung / Ir. Gary K.C. Yip	2574 7400	2827 8700	<a href="mailto:yipgary@dcd.gov.hk">yipgary@dcd.gov.hk</a>
Site Agent	Keniel Kong	2482 9587	2482 9113	<a href="mailto:KenielK@hcg.com.hk">KenielK@hcg.com.hk</a>
Independent Environmental Checker (IEC)	Dr. Gui Yi Li	2911 2233	2805 5028	-
Environmental Team Leader (ETL)	Raymond Dai	2975 3300	2897 5509	<a href="mailto:rdai@lamconstruct.com.hk">rdai@lamconstruct.com.hk</a>



**2.3 CONSTRUCTION PROGRAMME AND WORKS**

Construction activities carried out during this reporting period are summarized in **Table 2.3**:

**Table 2.3 Construction Activities – Jan-Mar 2006**

Location	Construction Works
Section 8	<ul style="list-style-type: none"><li>• Geotechnical Instrument Monitoring</li><li>• Water main and drainage installation on west embankment</li><li>• Embankment filling</li><li>• Main Channel Formation Setting, Toe Block construction and grasscrete laying</li><li>• Kerb laying and Road Works Construction</li><li>• R.E. Wall Construction</li><li>• Main Channel Construction</li><li>• Embankment Filling</li></ul>
Section 9	<ul style="list-style-type: none"><li>• Geotechnical Instrument Monitoring</li><li>• Water main and drainage installation on west embankment</li><li>• Main Channel Formation Setting, Toe Block construction and grasscrete laying</li><li>• R.E. Wall Construction</li><li>• XPM Mesh Installation</li><li>• Embankment Construction</li><li>• Coping Construction</li><li>• Road Works Construction</li></ul>
Section 10	<ul style="list-style-type: none"><li>• General fill filling for formation of structure</li><li>• Geotechnical Instrument Monitoring at Storage Pond</li><li>• Storage Pond Construction</li><li>• Wetland Construction</li></ul>



### 3 IMPLEMENTATION STATUS

#### 3.1 STATUS OF REGULATORY COMPLIANCE

A summary of the current status on licences and/or permits on environmental protection pertinent to the Project is shown in **Table 3.1**.

**Table 3.1 Cumulative Summary of Valid Licences and Permits**

Permits and/or Licences	Reference No.	Issued Date	Expiry Date	Status
Environmental Permit	EP-124/2002	28-03-2002	-	Issued
Registration of Waste Producer	WPN5113-542-H2913-22	24-01-2003	-	Issued
Notification of Works Under APCO	-	-	-	Notified
Effluent Discharge Licence	1S49/1	04-08-2003	31-08-2008	Issued
Effluent Discharge Licence for Septic Tank System	1S41N/1	20-03-2003	-	Issued
Construction Noise Permit	GW-RN0060-05	09-03-2005	08-09-2005	Issued

#### 3.2 IMPLEMENTATION OF POLLUTION CONTROL / MITIGATION MEASURES

The contractor implemented various environmental mitigation measures as recommended in the EIA report. The implementation schedule is presented in [Appendix B](#).

#### **4 MONITORING REQUIREMENTS**

Locations of environmental monitoring stations are referred in [Figure 4.1](#).

##### **4.1 AIR MONITORING**

The project has 1 air monitoring station, namely AM1. Details of the air monitoring stations are summarized in **Table 4.1**.

**Table 4.1 Air Quality Monitoring Stations**

Station	HK Metric Grid (Easting / Northing)
AM1	826006E / 840543N

Monitoring methodology and calibration details shall be referred to respectively monthly reports.

##### **4.2 NOISE MONITORING**

The project has two designated Noise Monitoring Stations, namely Tung Chan Wai (NM1) and the pumping station (NM2). Noise monitoring for the pumping station (NM2) shall only be carried out on two occasions, day 1 and day 60 of the commissioning stage. For NM1, due to distance from the works area to the village, and the expanse of container activities in between, a small residential dwelling at Yan Shau Wai slightly to the north of the Tung Chan Wai has been identified as being a more representative monitoring location, coded as NM1(A) for construction phase noise impact monitoring. Details of noise monitoring stations are summarized in **Table 4.2**.

**Table 4.2 Noise Monitoring Stations**

Station	HK Metric Grid (Easting / Northing)	Description	Measurement
NM1(A)	825982E / 840137N	Small residential house at Yan Shau Wai slightly to the north of the Tung Chan Wai	Façade

Monitoring methodology and calibration details shall be referred to respectively monthly reports.

#### 4.3 WATER QUALITY MONITORING

The EM&A Manual for this project has proposed one upstream station (WM1), one down stream station (WM2) within the San Tin Eastern Main Drainage Channel and, one upstream station (WM4) and one downstream station (WM3) at the discharge point for the San Tin Drainage Channel, once completed, within the Shenzhen River to be monitored for water quality.

Monitoring methodology and calibration details shall be referred to respectively monthly reports.

#### 4.4 MONITORING PARAMETERS AND FREQUENCY

Environmental monitoring programme has been scheduled according to the requirements stipulated in the Brief for EM&A produced for the Project summarized in **Tables 4.4**.

**Table 4.4 Environmental Monitoring Parameters and Frequencies**

Station(s)	Parameter	Frequency
AM1	24-hr TSP 1-hr TSP	Once in every 6 days Three times in every 6 days
NM1	$L_{Aeq}(30 \text{ min})$ , $L_{90}$ & $L_{10}$	Once a week between 0700-1900 hours on normal weekdays
	$L_{Aeq}(5 \text{ min})$ , $L_{90}$ & $L_{10}$	Once a week between 1900-2300 hours Once a week between 2300-0700 hours Once a week between 0700-1900 hours on holidays
WM1, WM2, WM3, WM4	Temperature, pH, DO, turbidity, SS, $NH_3-N$ and water depth	Once per week



**4.5 ENVIRONMENTAL QUALITY CRITERIA**

Environmental quality criteria were determined prior to the commencement of the construction of the project for the purpose of impact monitoring. Various levels established based on the results of baseline monitoring stipulated in the EM&A manual are summarized in **Tables 4.5a, 4.5b and 4.5c** respectively.

**Table 4.5a Action and Limit Levels for Air Quality Monitoring**

Parameter	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
24-hr TSP	225	260
1-hr TSP	390	500

**Table 4.5b Action and Limit Levels for Noise Monitoring**

Time Period	Parameter	Action Level	Limit Level
Normal Working Hours: 0700-1900 hrs	$L_{Aeq}(30\text{min})$	When one documented complaint is received within 2 weeks on the same location	75 dB(A)
Restricted Hours: Evenings: 1900-2300 hrs Sundays & Holidays: 0700-2300 hrs	$L_{Aeq}(5\text{min})$		70 dB(A)
Restricted Hours: 2300-0700 hrs	$L_{Aeq}(5\text{min})$		55 dB(A)

**Table 4.5c Action and Limit Levels for Water Quality Monitoring**

Parameter	Action Level	Limit Level
Dissolved Oxygen	0.59 (5%-ile of baseline data) for WM2 (downstream station)	0.55 (1%-ile of baseline data) for WM2 (downstream)
	0.46 (5%-ile of baseline data) for WM3 (downstream station mid-ebb tide)	0.39 (1%-ile of baseline data) for WM3 (downstream station mid-ebb tide)
Turbidity, SS, $\text{NH}_3\text{-N}$	120% of upstream control station at the same tide of same day	130% of upstream control station at the same tide of same day
pH	-	6-9

Note:

- For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- For SS and Turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- For pH, non-compliance of the water quality limits occurs when monitoring result is larger than pH value 9 or lower than pH value 6.



**5 QUARTERLY REVIEW OF MONITORING AND COMPLIANCE**

**5.1 AIR QUALITY**

The air quality monitoring results of 1-hr TSP and 24-hr TSP sampled at AM1 in this reporting period are reviewed and summarized in **Tables 5.1**. Graphical trend is presented in [Figure 5.1a-b](#).

**Table 5.1 Quarterly Air Quality Monitoring (24-hr TSP) Summary**

Parameter	No. of monitoring	No. of Valid Exceedance	Compliance %
24-hr TSP	15	0 (AL); 0 (LL)	100%
1-hr TSP	48	1 (AL); 6 (LL)	85.42%

No valid exceedances for 24-hr TSP monitoring and 6 exceedances for 1-hr TSP monitoring were found to be due to DC/2001/09 activities in this reporting period. Contractor's implementation of dust suppression measures has been reviewed and was reminded to maintain the dust suppression at all times.

Other exceedances were investigated and found to be due to local weather impairing the air quality. Such results indicate air impact was kept minimal and DC/2001/09 contractor needs to further effort to minimize dust suppression in dry weather.

**5.2 NOISE**

The noise monitoring results measured at NM1(A) in this reporting period are reviewed and summarized in **Tables 5.2**. Graphical trend is presented in [Figure 5.2](#).

**Table 5.2 Quarterly Noise Monitoring Summary**

Period	No. of monitoring	No. of Valid Exceedance	Compliance %
Daytime	15	0 (AL); 0 (LL)	100%
Night time	15	0 (AL); 0 (LL)	100%
Holiday	13	0 (AL); 0 (LL)	100%

There were no data losses in noise monitoring and no exceedance reported during this reporting period. Such results indicate minimal noise impact was created by DC/2001/09 activities.

**5.3 WATER QUALITY**

No water quality monitoring results was measured or tested for WM2 and WM3 in this reporting period.

During the reporting period, no successful water sample was taken at all water quality monitoring events due to extremely low water level. Further to recent liaison between the police and the contractor, access to water quality monitoring stations could be arranged, thus alternative water monitoring station suggested in February 2006 was regarded as unnecessary.

**5.4 WASTE MONITORING RESULTS**

During this reporting period,

- 387ton C&D material was disposed at public fills at Tuen Mun Area 38;
- 0m<sup>3</sup> treated soil was disposed;
- 13.5 ton general refuse was disposed at landfills;
- No chemical waste was collected by a licensed collector.

**6**

**COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION**

No complaint, inspection notice, notification of summons or prosecution was received in this reporting period. Cumulative complaint log, summaries of complaints, notification of summons and successful prosecutions are presented in **Table 6a**, **6b** and **6c** respectively.

**Table 6a** *Environmental Complaints Log*

Complaint Log No.	Date of Receipt	Received From and Received By	Nature of Complaint	Date Investigated	Outcome	Date of Reply
STEMDC 001	28-07-2003	EPD	Dead fish in the pond caused bad odour and potential mosquito breeding.	29-07-2003	No visible cause can be identified attributed to construction activities.	29-07-2003

**Table 6b** *Cumulative Statistics on Complaints*

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative No. Project-to-Date
Air	-	-	-
Noise	-	-	-
Water	1	-	1
Waste	-	-	-
<b>Total</b>	<b>1</b>	<b>-</b>	<b>1</b>

**Table 6c** *Cumulative Statistics on Successful Prosecutions*

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative No. Project-to-Date
Air	2	-	2
Noise	-	-	-
Water	-	-	-
Waste	-	-	-
<b>Total</b>	<b>2</b>	<b>-</b>	<b>2</b>



**7**

**CONCLUSION**

The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed in the previous EM&A Report were made in response to changing circumstances.

6 exceedances for 1-hr TSP monitoring were recorded and investigated to be caused by DC/2001/09 contractor in this reporting period. Contractor's implementation of dust suppression measures has been reviewed and was reminded to maintain the dust suppression at all times, especially during the dry season.

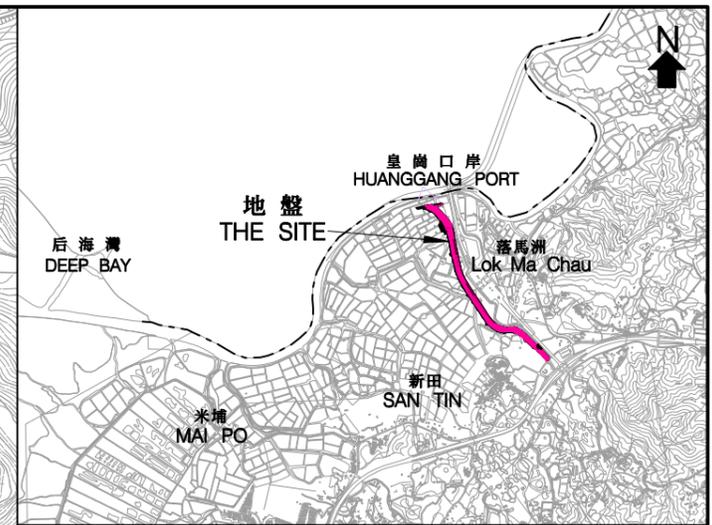
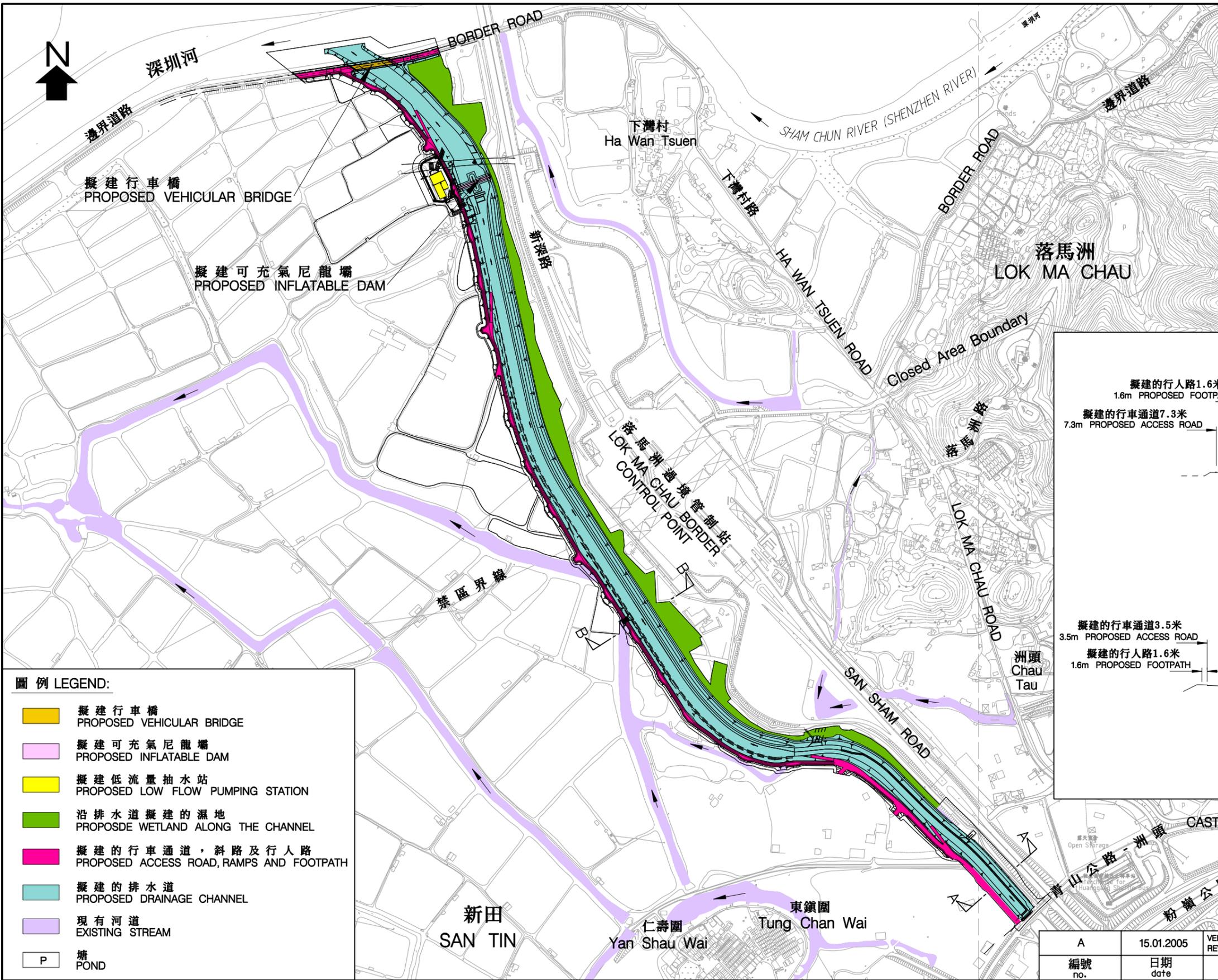
There was no notice of complaint or prosecution reported in this reporting period. However, contractor of DC/2001/09 was strongly reminded to ensure prompt response towards the environmental observations identified during the weekly inspection. Such results indicate that the construction operation generally performed marginally acceptable against the noise, air and water quality environmental auditing criteria.

In summary, dust, noise and water quality mitigation measures and waste management practices are being satisfactorily implemented within the DC/2001/09 project in order to control on-going construction activities.



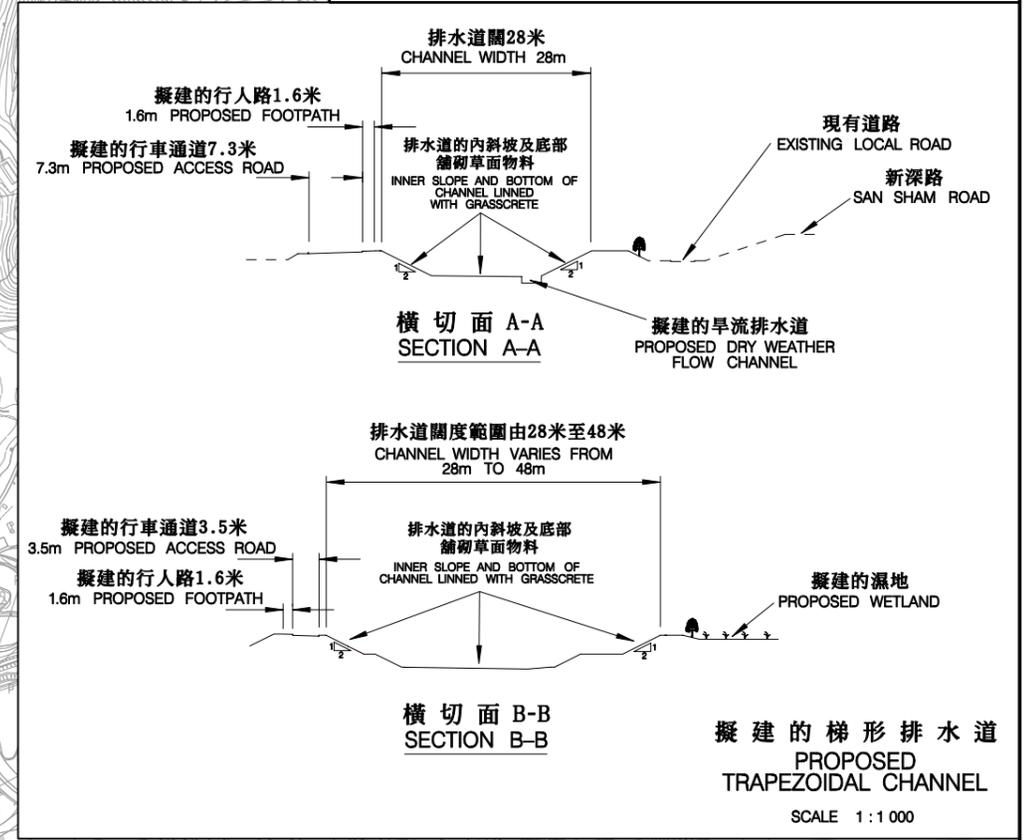
***Figure 2.1***

***Location Plan***



索引圖 KEY PLAN 比例 1:75 000 SCALE

- 圖例 LEGEND:**
- 擬建行車橋 PROPOSED VEHICULAR BRIDGE
  - 擬建可充氣尼龍壩 PROPOSED INFLATABLE DAM
  - 擬建低流量抽水站 PROPOSED LOW FLOW PUMPING STATION
  - 沿排水道擬建的濕地 PROPOSED WETLAND ALONG THE CHANNEL
  - 擬建的行車通道, 斜路及行人路 PROPOSED ACCESS ROAD, RAMPS AND FOOTPATH
  - 擬建的排水道 PROPOSED DRAINAGE CHANNEL
  - 現有河道 EXISTING STREAM
  - 塘 POND



編號 no.	日期 date	內容摘要 description	核對 checked	核准 approved
A	15.01.2005	VEHICULAR BRIDGE DELETED. SECTION DETAILS REVISED. ACCESS ROAD ALIGNMENT AMENDED.	SIGNED	SIGNED

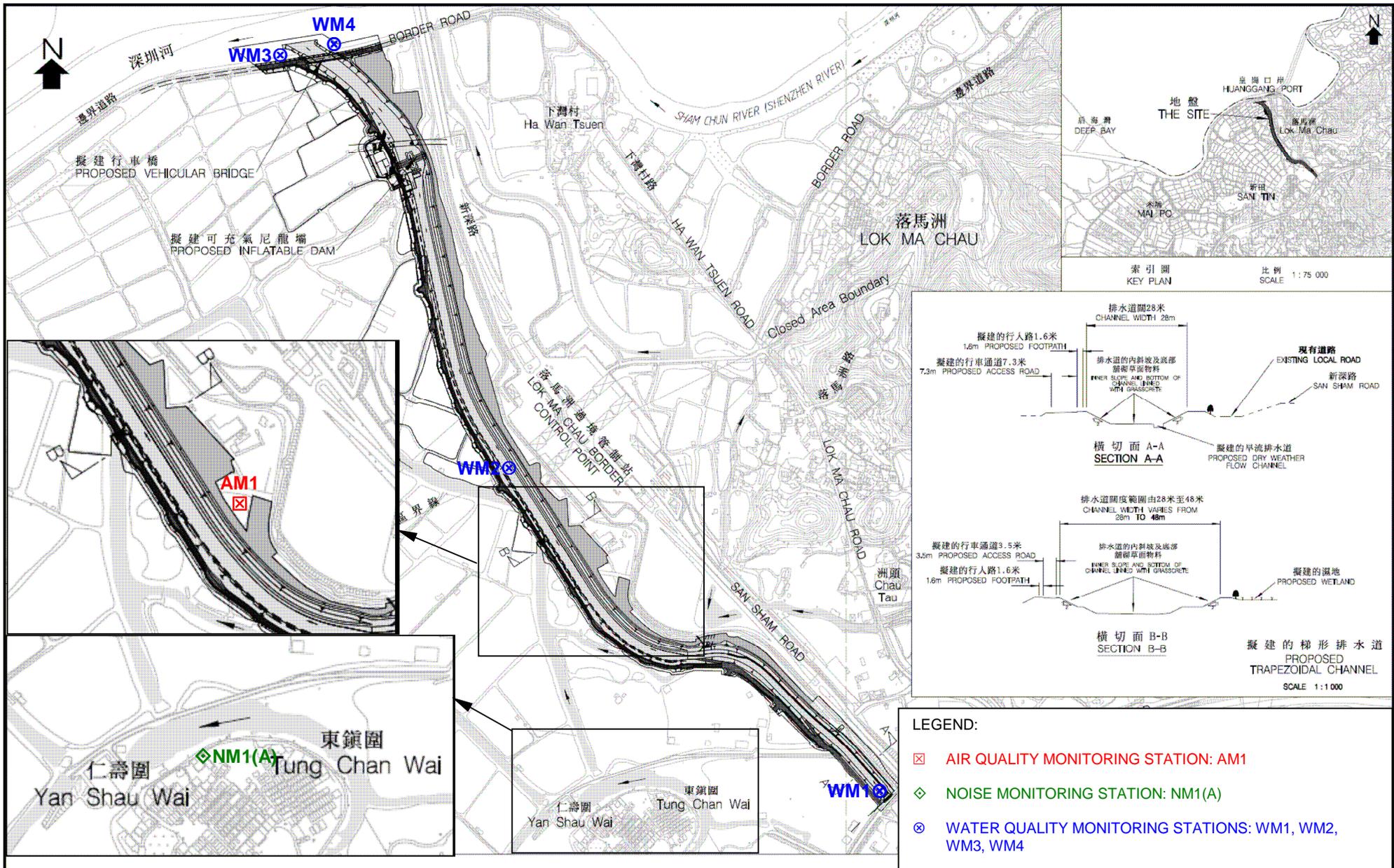
修訂 REVISION

圖則名稱 drawing title		繪圖 drawn	簽署 initial	日期 date	項目編號 item no.	辦事處 office
<b>新田東面主要排水道</b> <b>SAN TIN EASTERN MAIN DRAINAGE CHANNEL</b>		C CHUN	SIGNED	18.07.2002	73CD	新界西及北拓展處 NEW TERRITORIES NORTH AND WEST DEVELOPMENT OFFICE <b>土木工程拓展署</b> CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
		核對 checked	簽署 initial	日期 date	比例 scale	
		C S KWOK	SIGNED	18.07.2002	1:7 500	
核准 approved	簽署 initial	日期 date	圖則編號 drawing no.			
					NTNZ 1145A	



*Figure 4.1*

*Layout of Environmental Monitoring Stations*



Lam Environmental Services  
 Test Specialists and Environmental Analysts

FIGURE 4.1 LAYOUT OF ENVIRONMENTAL MONITORING STATIONS

REV. : A  
 DATE : 30 JUL 05  
 SCALE : N.T.S.



***Figure 5.1a-b***

***Graphical Plot of 24-hr and 1-hr TSP Levels***

Figure 5.1a - Graphical Plot of 24-hr TSP Levels at AM1

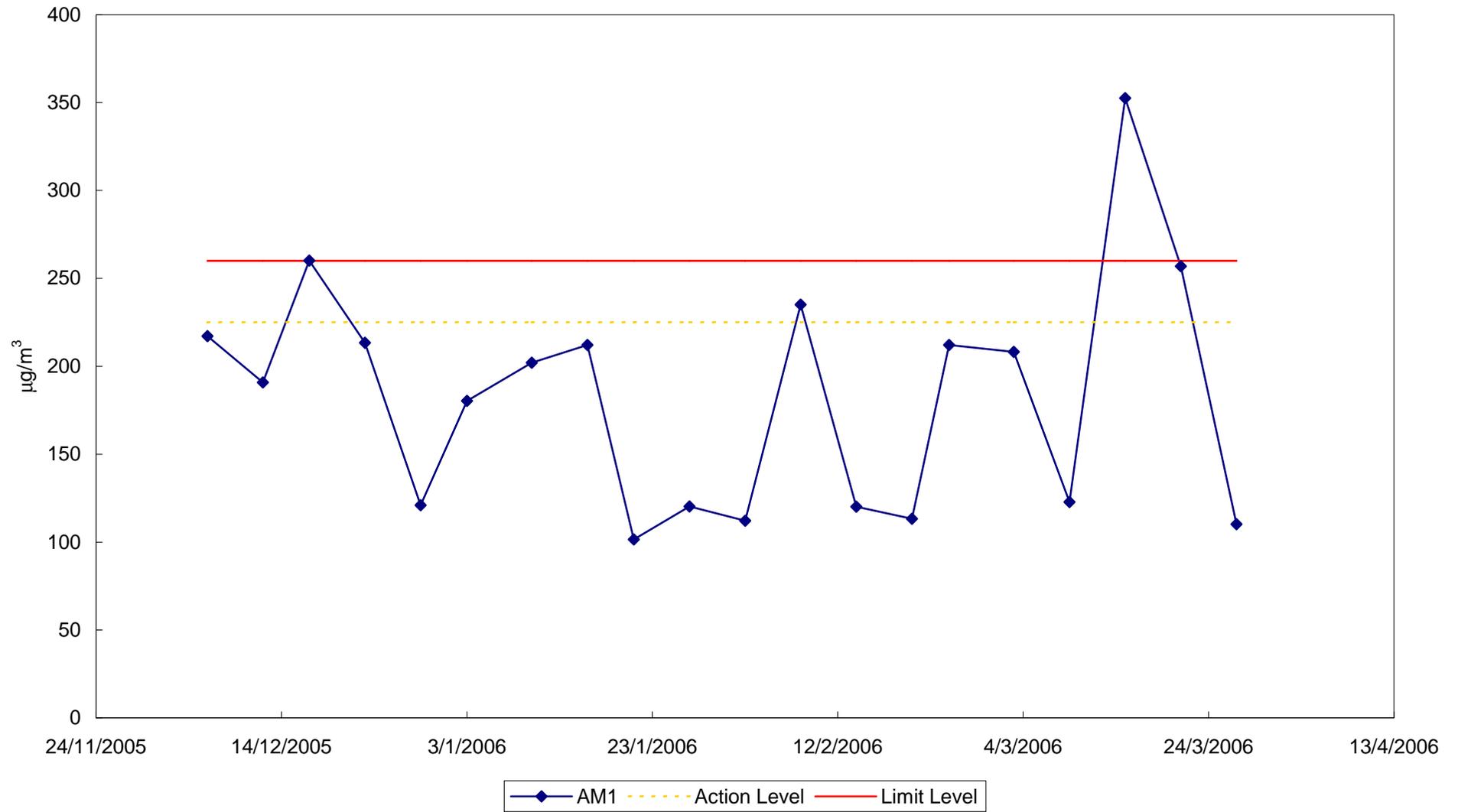
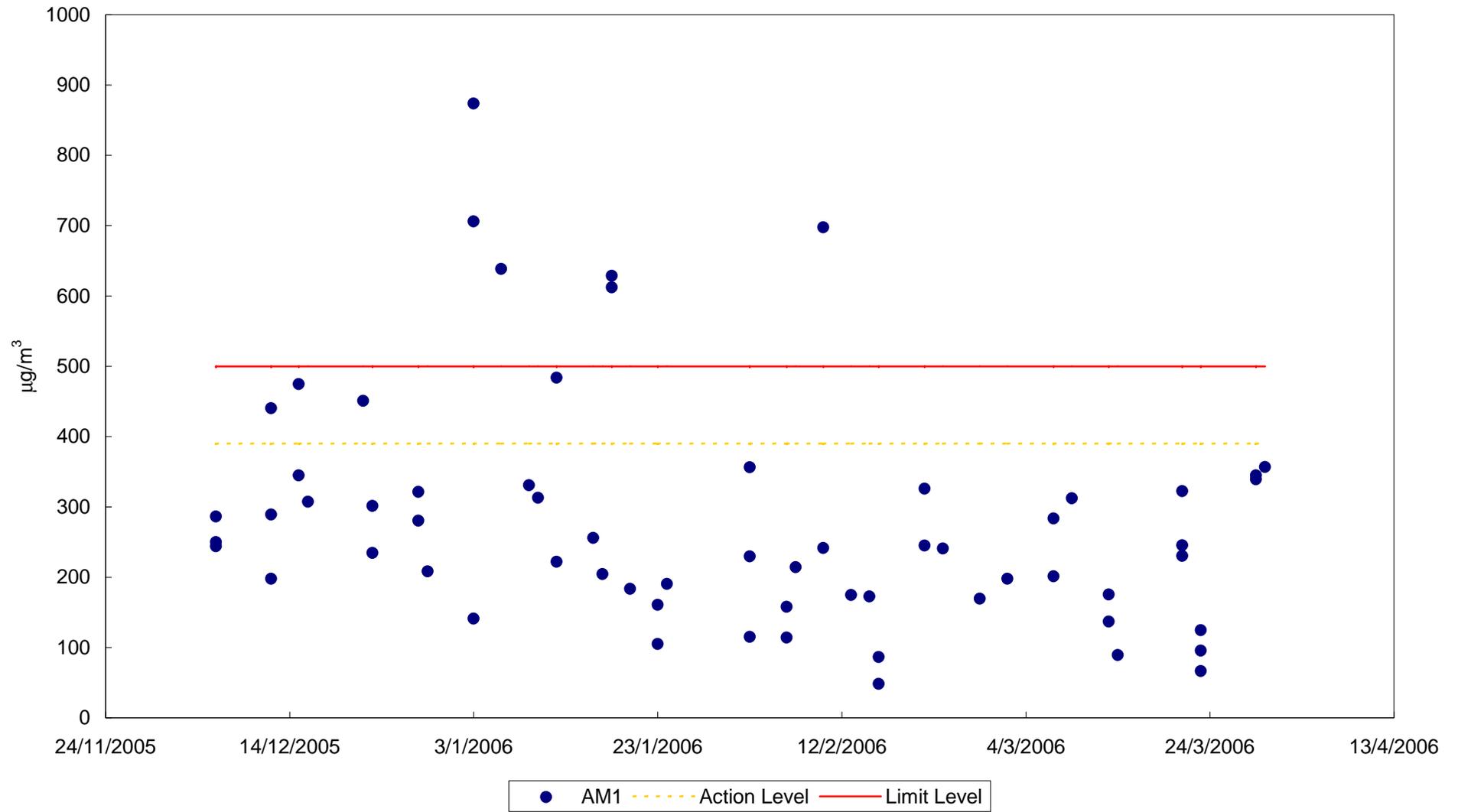


Figure 5.1b - Graphical Plot of 1-hr TSP Levels at AM1

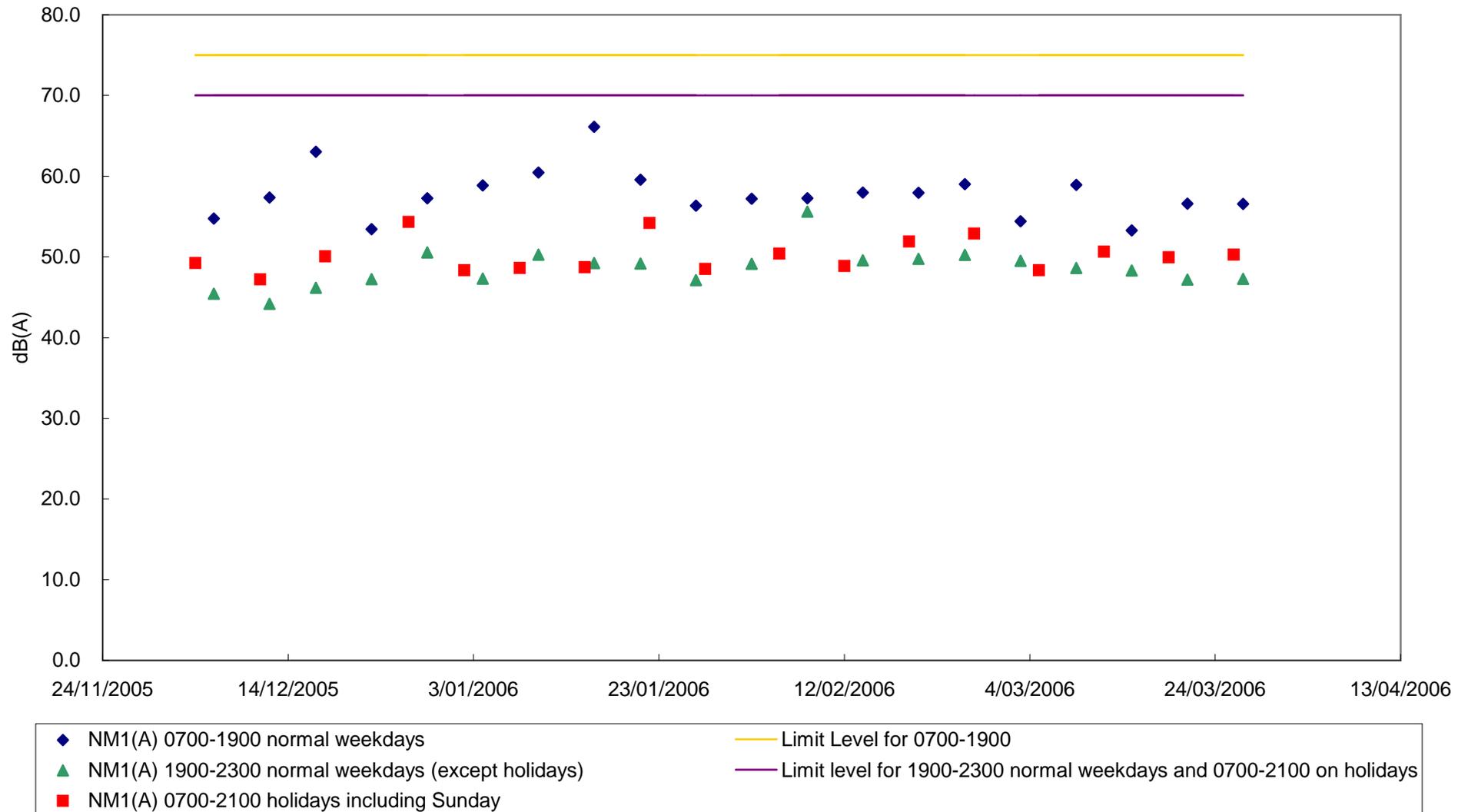




*Figure 5.2*

*Graphical Plot of Noise Levels*

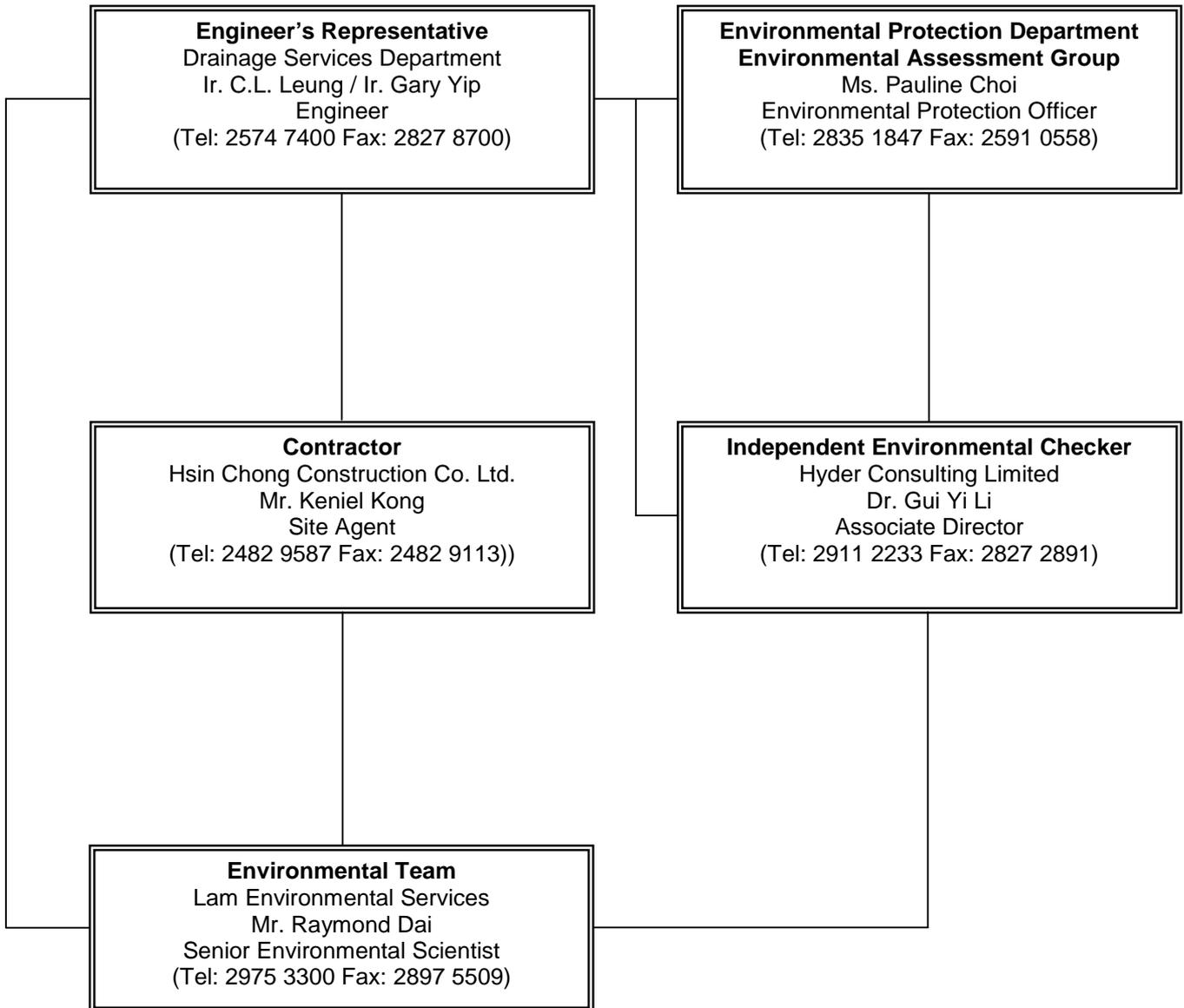
Figure 5.2 - Graphical Plot of Noise Levels at NM1(A)





*Appendix A*

*Organization Chart*





***Appendix B***

***Implementation Schedule of Mitigation Measures***



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Dust	8.4.4.1	Vehicle washing facilities shall be provided at the exit point of the site;	Entrance/exit of site	All period during construction phase	Site Agent / Engineer	Implemented
	8.4.4.1	Any debris or materials shall be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and 3 sides;	Whole site	All period during construction phase	Site Agent / Engineer	Improvement required
	8.4.4.1	Water spray or dust suppression chemical shall be provided during material handling and excavation;	Whole site	All period during construction phase	Site Agent / Engineer	Improvement required
	8.4.4.1	The load on the vehicle shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
Odour	8.4.4.2	Any odorous dredged material shall be placed remote from air sensitive receivers;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	8.4.4.2	Any odorous permitted stockpiled material shall be removed within 2 days of work to reduce the amount of time available for decomposition;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	8.4.4.2	Any odorous permitted stockpiled material shall be covered with plastic tarpaulin sheets in the stockpile area.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
Monitoring	EM&A 2.7	The 24 hour TSP level monitored at the monitoring station shall be comply with the Limit level of 260 $\mu\text{gm}^3$ ;	Whole site	All period during construction phase	ET Leader	Implemented
	EM&A 2.7	The hourly TSP level monitored at the monitoring station shall comply with the Limit level of 500 $\mu\text{gm}^3$ .	Whole site	All period during construction phase	ET Leader	Implemented
Construction Activities	7.4.4.2	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the re-profiling works;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	7.4.4.2	Plant and mobile plant (i.e. trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	7.4.4.2	Plant known to emit noise strongly in one direction, shall be orientated so that the noise is directed away from the NSRs;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	7.4.4.2	Silencers or mufflers on construction equipment shall be utilised and shall be properly maintained during the re-profiling works;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	7.4.4.2	Mobile plant shall be sited far away from the NSR's;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	7.4.4.2	Material stockpiles and other structures shall be effectively utilised to screen noise from on-site construction activities; and	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	7.4.4.2	The Contractor shall select the models of PMEs that are quieter than the standard types given in GW-TM.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Operation Activities	7.5.4.1	Considering sensitivity of the Deep Bay buffer zone area, it is recommended that a maximum noise of Leq(5min.) 75 dB(A) be achieved at 1m from the louver of the pumping station through good engineering design.	Pumping Station	Design and Operation Phases	DSD's Engineer	Not applicable to construction phase
Monitoring	EM&A 3	The baseline noise monitoring shall be carried out;	Monitoring location, NM1	Prior to commencement of construction	ET Leader	Implemented
		Construction noise monitoring shall be carried out;	Monitoring location, NM1	All period during construction phase	ET Leader	Implemented
		Operational noise shall be carried out 1m from the louvre of the pumping station during commissioning stage.	Monitoring location, NM2	Commissioning/operational phase	DSD's Engineer	Not applicable to construction phase
Construction Excavation of Sediment	4.4.4.3-4	If excavation on wet stream is not avoidable, the following shall be implemented: <ul style="list-style-type: none"> <li>- Minimise disturbance to the stream bed while excavating;</li> <li>- Minimise leakage of excavating material during lifting;</li> <li>- Prevent loss of material during transport of excavated material;</li> <li>- Prevent discharge of excavated material except at approved locations;</li> <li>- To minimize the leakage and loss of sediments during excavation, tightly sealed closed grab excavators shall be employed in river sections where material to be handled is wet.</li> </ul>	Stream Channel	All period during stream channel excavation	Site Agent / Engineer	Implemented Implemented Implemented Implemented Implemented
Construction Works Timing	4.4.4.5	Excavation shall be undertaken during periods of low flow (dry season).	Stream Channel	All period stream channel excavation	Site Agent / Engineer	Implemented
Construction Runoff and Drainage	4.4.4.6-8	Exposed soil areas shall be minimized to reduce the potential for increased siltation, contamination of run-off and erosion. In addition, no site run-off shall enter fishponds. Construction run-off impacts associated with above ground construction activities shall be controlled through the use of appropriate mitigation measures which include:	All works area	All period during construction phase	Site Agent / Engineer	Improvement required
	4.4.4.6-8	Temporary ditches shall be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond.	All works area	All period during construction phase	Site Agent / Engineer	Improvement required
	4.4.4.6-8	The boundaries of earthworks shall marked and surrounded by dykes or embankments for flood protection.	All works area	All period during construction phase	Site Agent / Engineer	Implemented
	4.4.4.6-8	Open material storage stockpiles shall be covered with tarpaulin or similar fabric to prevent material washing away.	All works area	All period during construction phase	Site Agent / Engineer	Implemented



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Construction Excavation of Sediment	4.4.4.6-8	Exposed soil areas shall be minimized to reduce the potential for increased siltation and contamination of run-off.	All works area	All period during stream channel excavation	Site Agent / Engineer	Improvement required
		Earthwork final surfaces shall be well compacted and subsequent permanent work shall be immediately preformed.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
		The use of sediment traps.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
		The adequate maintenance of drainage systems to prevent flooding and overflow.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
		All temporary drainage pipes and culverts provided to facilitate run-off discharge shall be adequately designed to facilitate rapid discharge of storm flows. All sediment traps shall be regularly cleaned and maintained. The temporarily diverted drainage shall be reinstated to its original condition, when construction work is completed or the temporary diversion is no longer required.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
		Sand and silt in wash water from wheel washing facilities shall be settled out and removed before discharge into temporary drainage pipes or culverts. A section of the haul road between the wheel washing bay and the public road shall be paved with backfill to prevent wash water or other site run-off from entering the public road.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented,
		Oil interceptors shall be provided in the drainage system downstream of any significant oil and grease sources. They shall be regularly maintained to prevent the release of oils and grease into the storm water drainage system after accidental spillage. The interceptor shall have a bypass to prevent flushing during heavy rain.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
General Construction Construction Runoff and Drainage	4.4.4.10	Debris and rubbish on site shall be collected, handled and disposed of properly.	All works area	All period during construction phase	Site Agent / Engineer	Improvement required
	4.4.4.11	All fuel tanks and storage areas shall be provided with locks and placed on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching the downstream.	All works area	All period during construction phase	Site Agent / Engineer	Improvement required



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Marine Disposal of Excavated Sediment	4.4.412	The decks of the marine dumping disposal barges and floating pontoons shall be kept tidy and free of oil or other substances or articles which might be accidentally or otherwise washed overboard.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	Marine dumping was completed.
	4.4.412	All off-site vessels and barges shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement of propeller wash.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	
	4.4.412	The works shall cause no visible foam, oil, grease, scum, litter or other objectionable matter to be present on the water at the loading berth or dumping grounds.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	
	4.4.412	Water tight trucks shall be used for transportation of marine disposal of excavated material.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	
	4.4.413	Additional provisions shall be required upon confirmation that marine sediments are contaminated. Location and depths of areas of contaminated marine sediments shall be indicated in the construction contract. The Contractor shall ensure that contaminated sediments are excavated, transported and placed in approved special dumping grounds in accordance with relevant Technical circulars.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	
	4.4.414	Transport of contaminated marine mud to the marine disposal grounds shall be by split barge of not less than 750m <sup>3</sup> capacity, well maintained and capable of rapid opening and discharge.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	
	4.4.414	The material shall be placed in the pit by bottom dumping, at a location within the pit specified by the FMC.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	
	4.4.414	Discharge shall be undertaken rapidly and the hoppers shall then immediately be closed, material adhering to the sides of the hopper shall not be washed out of the hopper and the hopper shall remain closed until the barge next returns to the disposal site.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	
	4.4.414	The dumping vessel shall be stationary throughout the dumping operation.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	
	4.4.414	The Contractor must be able to position the dumping vessel to an accuracy of ±10m.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	
4.4.414	Barge loading shall be monitored to ensure that loss of material does not take place during transportation.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer		



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Marine Disposal of Excavated Sediment (cont'd)	4.4.414	Transport barges or vessels shall be equipped with automatic self monitoring devices as specified by the EPD.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	Marine dumping was completed
	4.4.414	The Contractor shall follow procedures as outlined in the Guidance Note for Dumping and Additional Conditions on Disposal of Contaminated Marine Mud at East Sha Chau Contaminated Mud Disposal.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	
Sewage Effluents	4.4.415	Construction work force sewage is expected to be handled by portable chemical toilets along the alignment if connection to a public sanitary sewer system is not feasible. Appropriate and adequate portable toilets shall be provided by licensed contractors who shall be responsible for appropriate disposal and maintenance of these facilities.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
Monitoring	EM&A 4.5	The baseline water quality monitoring shall be carried out.	Monitoring locations, WM1, WM2, WM3 and WM4.	Prior to commencement of construction	ET Leader	Complete
	EM&A 4.6	Construction phase water quality monitoring shall be carried out.	Monitoring locations, WM1 and WM2	All period during construction phase	ET Leader	Implemented
General	5.4.5.2	Training and instruction shall be given to construction staff to increase awareness and draw attention to waste management issues and the need to minimize waste generation.	All works area	All period during construction phase	Site Agent / Engineer	Implemented
	5.4.5.2	The Contractor shall prepare an on-site management plan of the construction works which should take into account the recommended mitigation measures in the EIA report. Site specific factors such as the designation of areas of segregation and temporary storage of reusable and recyclable materials should be incorporated.	All works area	Before construction phase	Site Agent / Engineer	Improvement required
Storage, Collection and Transportation of Waste	5.4.5.3	Wastes shall be handled and stored in a manner to ensure that they are held securely without loss or leakage.	All works areas	All period during construction phase	Site Agent / Engineer	Improvement required
		Licensed waste haulers shall be used and they shall only collect wastes prescribed by their permits.	Waste/refuse Storage areas	All period during construction phase	Site Agent / Engineer	Implemented
		Wastes shall be removed	Waste/refuse Storage areas	Daily during construction	Site Agent / Engineer	Implemented
		Waste storage areas shall be maintained and cleaned on a daily basis.	Waste/refuse Storage areas	All period during construction phase	Site Agent / Engineer	Improvement required
		Windblown litter and dust during transportation shall be minimized by either covering trucks or transporting wastes in enclosed containers.	Waste handling trucks	After waste collection & before trucks leave the construction site	Site Agent / Engineer	Implemented



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Storage, Collection and Transportation of Waste (cont'd)	5.4.5.3	Obtain the necessary waste disposal permits from the appropriate authorities.	-	Before construction of the Eastern MDC	Site Agent / Engineer	Implemented
	5.4.5.3	Wastes shall be disposed of at licensed waste disposal facilities.	-	All period during construction phase	Site Agent / Engineer	Implemented
	5.4.5.3	Develop procedures such as ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur; and	-	All period during construction phase	Site Agent / Engineer & ET Leader	Implemented
	5.4.5.3	Maintain records of the quantities of wastes generated, recycled and disposed.	-	All period during construction phase	Site Agent / Engineer & ET Leader	Implemented
Construction and Demolition Waste	5.4.5.5	Careful design, planning and good site management shall be adopted to minimize over-ordering and generation of waste materials such as concrete, mortars and cement grouts.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
		The handling and disposal of bentonite slurries shall be undertaken in accordance with Practice Note for Professional Persons – Construction Site Drainage (ProPECC PN 1/94) on construction site drainage. Cover open stockpiles of construction and demolition materials, and temporarily exposed slopes by tarpaulin or similar fabric, particularly during rainy season.	All works areas	All period during construction phase	Site Agent / Engineer	No bentonite used in this stage
	5.4.5.9 and 5.4.5.6	Construction and demolition material shall be segregated to inert and non-inert parts. The inert portion shall be re-used at areas of reclamation or land formation, or to public filling area shall such a allocation is deemed necessary. The non-inert portion shall be disposed of to landfill.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
Chemical Waste	5.4.5.12	Chemical waste produced shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented
	5.4.5.13	Containers used for the storage of chemical wastes shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450litres unless the specifications have been approved by EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Chemical Waste Regulation.	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented
	5.4.5.14	The chemical waste storage area shall be clearly labeled and used solely for storage of chemical waste, enclosed on at least 3 sides; have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste stored in that area; have adequate ventilation; be covered to prevent rainfall entering; and be arranged so that incompatible materials are adequately separated. Disposal of chemical waste shall be via a licensed waste collector; and to a facility licensed to receive chemical waste; or to a reuser of waste.	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
General Refuse	5.4.5.17	General refuse on-site shall be stored in enclosed bins separate from construction and chemical wastes. A reputable waste collector shall be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
	5.4.5.18	General refuse shall be largely by food service activities on site, so reusable rather than disposable dishware shall be used if feasible. Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible; separate, labeled bins for their deposit shall be provided if feasible.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
	5.4.5.19	Office wastes can be reduced through recycling if volumes are large enough to warrant collection. Participation in a local collection scheme shall be considered if one is available.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
Dust	5.4.5.20	Wetting the surface of the stockpiled soil with water in dry season unless during emergency; covering the stockpile soil with sheets; minimize disturbance of the stockpile soil; and enclosure of the stockpiling area.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
Water Quality	5.5.5.20	There shall be a separate surface water drainage system for the stockpiling area; silt traps shall be installed for surface water drainage system and the stockpile material shall be covered with tarpaulin during heavy rainstorm.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
Excavated Materials/ Contaminated Sediment	5.4.5.21	Sampling and analysis of the sediment to confirm the level of contamination is required prior to construction of the MDC. A sediment Quality Report shall be submitted to FMC and EPD for allocation of final disposal site and issuance of disposal permit. This is to ensure that specific disposal requirements and precautionary handling procedures can be determined; DSD to advise FMC on the quality and quantity of the contaminated sediment arising during the detailed design stage.	Proposed Sediment sampling points of MDC	Before construction phase	Site Agent / Engineer	Not required for the contractor
	5.4.5.21	The use of bulk earth-moving equipment to minimize the contact of contaminated material with construction workers.	All excavation/ Dredging area	During excavation/ Dredging of MDC	Site Agent / Engineer	Implemented
	5.4.5.21	Minimising exposure to any contaminated material by the wearing of protective gear such as gloves, providing adequate hygiene and washing facilities and preventing eating during excavation.	All excavation/ Dredging area	During excavation/ Dredging of MDC	Site Agent / Engineer	Implemented
	5.4.5.21	Any contaminated mud or sediment excavated shall not be allowed to stockpile on site and shall be immediately removed from site once excavated.	All excavation/ Dredging area	During excavation/ Dredging of MDC	Site Agent / Engineer	Implemented
	5.4.5.21	Excavated sediment shall be transported by water-tight trucks to potential marine barging points, then to sea going barges for transfer to designated marine disposal grounds.	All excavation/ Dredging area	During excavation/ Dredging of MDC	Site Agent / Engineer	Implemented



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Excavated Materials/ Contaminated Sediment (cont'd)	5.4.5.21	Permitted waste haulers shall be used to collect and transport contaminated sediments for disposal.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
	5.4.5.21	All vessels for marine transportation of excavated sediment shall be fitted with tight fitting seals to their bottom openings to prevent leakage of materials.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
	5.4.5.21	Loading of barges and hoppers shall be controlled to prevent splashing of excavated material to the surrounding water, and barges or hoppers shall under no circumstances to be filled to a level which shall cause the overflowing of materials or polluted water during loading or transportation.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
	5.4.5.21	The decks of any off-site barges (for disposal to marine dumping grounds) and floating pontoons shall be kept tidy and free of oil or any other substances or articles which might be accidentally or otherwise washed overboard.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
Habitat Mitigation	3.6.4.2	Isolate working area from remainder of TOAs and other temporarily affected ponds by constructing earth bund across ponds within the works boundary 50m from the west edge of the Eastern MDC. Do not drain pond area outside the 50M limit during bund construction, or refill them immediately following bund construction.  Remove bunds, reinstate the 50m wide working area portion of the affected ponds upon completion of construction.  Provide access for fish ponds affected by the project.	All other TOAs and all other fish ponds drained down for project construction at Eastern MDC works site	Design and construction stage	Site Agent / Engineer	Implemented
	3.6.4.5	Deletion from design of maintenance access road on eastern MDC embankment (already accomplished)	Eastern embankment of Eastern MDC	Already accomplished (design stage)	Site Agent / Engineer	Not required for contractor
	3.6.4.6	Design and construction of flood storage pond at San Tin Village: grasscrete sides at 1 in 2 slope, concrete bottom.	Flood storage pond, San Tin villages	Design and construction stage	DSD's Engineer	Not required for contractor
	3.6.4.6- 3.6.4.8	Management of flood storage pond at San Tin Villages: maintain water depth of 0.3m to 0.85m through pond design and pump operation except during maintenance or exceptional circumstances. Allow up to 150m of sediment to accumulate on bottom; Avoid dredging clear to the bottom; Allow vegetation to colonise banks; Cut back vegetation only on maintenance-need basis; Allow fish to colonise pond naturally.	Flood storage pond, San Tin villages	Throughout operational lifetime of pond	DSD's Engineer	Not required for contractor



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Habitat Mitigation (cont'd)	3.6.4.9	Maintenance of Tsing Lung Tsuen drainage channel: Do not cut back vegetation along sides of channel except as required for channel maintenance.	Channel outside San Tin villages polder	Throughout operational lifetime of pond	DSD's Engineer	Not applicable in this stage
	3.6.4.10	Design and construction of tidal portion of Eastern MDC: Grasscrete sides at 1 in 2 slope; earthen bottom in channel.	Eastern MDC downstream of inflatable dam	Project design and construction phases	DSD's Engineer and TDD (design)	Not applicable in this stage
		Maintenance of tidal portion of Eastern MDC: Minimise cutting back of vegetation to lowest levels compatible with maintaining flood capacity. Minimise dredging of channel bottom in this zone to lowest levels compatible with maintaining flood capacity.	Eastern MDC downstream of inflatable dam	Throughout operational lifetime of channel	Site Agent / Engineer DSD's Engineer	Not applicable in this stage
	3.6.4.11-3.6.4.12 Annex 3-J	Design, construction and management of constructed wetland area east of Eastern MDC: to provide wetland habitats useful to wildlife, with varied water depth, and planting of wetland vegetation and trees/bamboos; details as specified in Annex 3-J	Location shown in EIA Report Figure 3.6c, east of Eastern MDC and west of San-Sham Road	Construction of wetlands simultaneous with or immediately on completion of Eastern MDC construction. Management to begin upon completion of wetland construction and to continue throughout lifetime of channel.	DSD and TDD (design) Site Agent / Engineer (earthworks vegetation) DSD (maintenance of outlet pipes and flag valves) Lands Dept. (lands administration) AFD (vegetation management)	Implemented
3.6.4.13	Design of Eastern MDC upstream of inflatable dam: Grasscrete lining of channel except DWF channel; channel banks at 1 in 2 slope.	Eastern MDC Upstream of inflatable dam	Project design and construction phases	DSD and TDD (design) and Site Agent / Engineer (construction)	Not applicable in this stage	
	Hydroseeding of outer embankments of Eastern MDC. Plant stands of bamboos and trees at sites along Eastern MDC embankments as shown in Figure 3.6e; species and density as described in Annex 3-J. Replace any dead plantings during one-year establishment Period with species approved by TDD and AFD.	At sites along Eastern MDC as marked in Final EIA Report Figure 3.6e	Simultaneous with or immediately following completion of channel construction	DSD and TDD (design); Site Agent / Engineer (implementation Including establishment phase)	Not applicable in this stage	
Water quality	3.6.4.20-21	Water quality control measures: Implement and enforce water quality control measures outlined in implementation schedule for water section. Dredging of existing stream channel shall only be undertaken in dry season unless during emergency conditions.	On work site	During construction phase	Site Agent / Engineer	Implemented



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
Wildlife Disturbance	3.6.4.22	Noise and disturbance control measures: Restrict movements of construction equipment and site workers to areas within the site boundary (including Temporary Works Areas) and approved entry/exit points under terms of contract; supervision by contractor. ET to brief site workers on the need to remain within the site and avoid disturbance to surrounding habitats. Tape off excavation areas. Implement and enforce measures recommended in Implementation Schedule item 5.	On works site	During construction phase	The Contractor and ET Leader	Implemented
Habitat Mitigation	3.6.5.2	Maintenance of Eastern MDC: Minimise dredging frequency and clearance of in-channel vegetation without compromising flood capacity of channel to unacceptable levels. Conduct dredging of existing stream channel only in dry season except under emergency conditions; follow relevant guidelines in the Water section of the Implementation Schedule during dredging. Operation of inflatable dam in Eastern MDC: Periodic review of dam operation in relation to ecological value of the Eastern MDC, as specified in EM&A Manual Section 6.2.1.	Eastern MDC  Eastern MDC	Throughout operational lifetime of channel  Throughout operational lifetime of channel	DSD's Engineer  DSD and TDD/Appointed ecologist (first three years); to be determined thereafter	Not applicable in this stage  Not applicable in this stage
Habitat Mitigation – Monitoring	EM&A 6.2.2 Task 1	Monitoring of bird use of San Tin Villages flood storage pond methodology as per EM&A Manual.	San Tin Villages Flood storage pond (see Final EIA Report, Figure 3.6c for location)	4 times per year for first 3 years of pond operation	Appointed ecologist /TDD	Not applicable in this stage
General	6.4.3.1  6.6.1.1-7  Annex 6-A	Determine the potential extent of any land contamination by developing a current Contamination Assessment Plan (CAP) for sites to be investigated. This CAP will be prepared and approved by EPD prior to site investigation. Depending on the investigation requirements, a contamination assessment report (CAR) will be prepared after contamination investigation activities have concluded.  Prepare the CAP for approval prior to the construction phase. Upon completion of subsequent CAR, discuss the results and data with EPD to determine the most appropriate course of action (which may or may not include mitigation works).  Perform the typical site investigation activities as per the CAP presented in Annex 6-A 9to be approved by EPD), and in accordance with applicable guidelines such as the ProPECC PN3/94 Guidance note.	Selected portions of site(s) which require specific contamination investigation  Selected portions of site(s) which require specific contamination investigation  Selected portions of site(s) which require specific contamination investigation	Prior to construction phase (as required)  Prior to construction phase (as required); and prior to development as required.  Prior to construction phase (as required)	DSD's Engineer  DSD's Engineer  DSD's Engineer	Not applicable to the contractor  Not applicable to the contractor  Not applicable to the contractor



Environmental Aspect	EIA Ref.	Operational Control	Responsible by	Implementation Period	Responsibility	Implementation Status
General (cont'd)	6.6.1.8	No soils shall be stockpiled. If this cannot be avoided, they shall be covered with tarpaulin to minimize the potential for run-off and prevent any pollution, especially during heavy rainstorms.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.6.1.8	Vehicles containing any contaminated materials shall be covered to limit potential dust emissions, or contaminated wastewater run-off during transportation or under wet conditions.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.6.1.8	All appropriate licenses and permits shall be obtained for working with contaminated material in accordance with appropriate regulations.	Whole site	Design phase	DSD's Engineer	Implemented
	6.6.1.8	All excavation activities in contaminated areas and the handling of contaminated groundwater shall be performed by the contractor and observed by and directed, as required, by the environmental specialist.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.6.1.8	Only licensed contractors shall be utilized for hauling the contaminated soil to the specified disposal location, and specific operational procedures shall be implemented for the activities.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.6.1.8	Liaison shall be maintained with EPD to ensure that all excavation activities have been performed to requirements.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.6.1.8	If the size of the excavation increases, engineering and other concerns may limit the depth or extent of excavation along the property boundaries, as required. Decisions on this matter shall be addressed by appropriate works contractor's engineering personnel and the environmental specialist as required, based on filed conditions.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.6.1.8	Procedures shall be developed to ensure that illegal disposal of wastes does not occur, and records of quantities of wastes Generated and disposed of shall be maintained.	Whole site	All period during construction phase	DSD's Engineer./ Site Agent / Engineer	Implemented
Health & Safety/ Contamination Exposure During Construction Works	6.4.3.2	No unauthorized persons shall be allowed into the work area, and necessary precautions shall be taken to prohibit unauthorized entry into the Site or works areas.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.4.3.2	Eating, drinking, smoking or any practice that increases the probability of hand to mouth transfer and ingestion of material is prohibited in any area designated as being contaminated.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.4.3.2	Food, beverages. Tobacco products, etc. are prohibited in any area designated as being contaminated. Adequate warning signs shall be posted to this effect.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
	6.4.3.2	Hands must be thoroughly washed upon leaving the work area, and before eating, drinking or any other activities.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented