PART G

IMPLEMENTATION SCHEDULE

CONTENTS:

1 INTRODUCTION

This Part of the EIA Report provides a consolidation of the mitigation measures recommended by the EIA Study for the Lamma Extension project.

The consolidation is presented in the form of an Implementation Schedule in accordance with part 3.10 (iii) of the *EIA Study Brief No. ESB-001/1998 - 1800MW Gas-fired Power Station at Lamma Station.*

The Implementation Schedule is presented as three tables:

- ***Table G1*** presents the Implementation Schedule for the construction and operation of the new power station;
- ***Table G2*** presents the Implementation Schedule for the construction and operation of the associated transmission system; and
- ***Table G3*** presents the Implementation Schedule for the construction and operation of the associated gas pipeline.

The Tables comprise column headings as follows:

- **PARAMETERS:** This denotes the environmental media or resources that is to be monitored or protected
- **MITIGATION MEASURES:** This denotes recommended measures, courses of action or subsequent deliverables that are to be adopted, undertaken or delivered to avoid, minimises or ameliorate predicted environmental impacts.
- **IMPLEMENTATION:** This indicates the programming or timing for the implementation of the recommended measures. This may be expressed as a specific programme date or development phase or may be "triggered" by an event which the measure is intended to control or influence.
- **RESPONSIBILITY:** This denotes where the responsibility lies for the implementation of the recommended mitigation measures.
- **AUDIT:** This denotes the manner by which the effectiveness of the mitigation measures (and their implementation) may be checked. Typically this column would indicate the documentation and/or records that will be generated and therefore be available for audit.

1 IMPLEMENTATION SCHEDULE

1.1 POWER STATION

Table G1 Recommended Mitigation Measures and their Implementation

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
General	EM&A Requirements	The Construction & Operational Phase EM&A Manuals shall be submitted to the DEP for approval 3 months prior to the commencement of the construction works & operation of the first 300MW unit respectively.	HEC	EM&A Manual
	HEC shall employ an Independent Environmental Checker (IEC) with at least 7 years of experience in environmental monitoring and audit. The IEC shall audit and verify the overall environmental mitigation measures submissions relating to environmental monitoring and auditing , and any other submissions to EPD.	During the construction and operational phases, 3 months prior to the submissions.	HEC	Self regulatory

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Air Quality - construction	For general construction works, the dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation shall be complied with, such as: • the haul roads shall be sprayed with water to keep the entire road surface wet.# • the load carried by vehicle shall be covered by impervious sheeting to ensure no leakage of dusty materials from the vehicle.# • the heights from which fill materials are dropped shall be controlled to a practical level to minimise the fugitive dust arising from unloading.#	During the construction period	HEC and Construction Contractor	Contractual requirements and works method statements
	For the concrete batching plant, the following control measures are recommended: • loading, unloading, handling, transfer or storage of any dusty materials shall be carried out in a totally enclosed system.# • the materials which may generate airborne dust emissions shall be wetted by water spray system.# • all receiving hoppers shall be enclosed on three sides up to 3 m above unloading point.# • all conveyor transfer points shall be totally enclosed.# *Note: # Regulated under the Air Pollution Control Ordinance and subsidiary legislation.*	During the construction period	HEC and Construction Contractor	Contractual requirements and licence provisions if applicable.

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Air Quality - operation	*Air Quality* HEC shall commit to the use of Gas-fired Combined Cycle technology for all 6 x 300 MW new units of the proposed new power station.	Design Phase	HEC	Procurement Specifications
	HEC shall examine the feasibility of converting the existing peak lopping oil-fired gas turbines to gas-firing, which shall lead to a reduction in greenhouse gas emissions during emergency use or peak lopping operations. Any schemes or plans of such conversions shall be verified by the IEC and submitted to EPD 3 months prior to the commencement of the works.	Report to EPD 3 months prior to commencement of works.	HEC	Submitted Report & On-site Records
	HEC shall continue to actively pursue and aid in developing the potential of using renewable energy in Hong Kong, such as photovoltaic cell and wind energy. A progress report shall be verified by the IEC and submitted to the EPD.	Report within 3 months of year end.	HEC	Submitted Report
	HEC shall implement the gas-fired units as base-load units. For the existing power station, the more efficient units incorporating FGD and low NO_x systems shall be operated first under normal situation to meet system demand. In case of any deviations from this, EPD shall be notified of the details and circumstances for the deviation.	Operational Phase	HEC	Submitted Report & On-site Records

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Air Quality - operation (con't)	Good housekeeping shall be implemented to ensure that the systems or equipment containing HFC, PFC and SF_6, shall not 'leak' out. Associated measures shall include: • routine maintenance and inspections; • minimising emissions during the installation, operation, maintenance, repair, disposal, and decommissioning of systems and equipment containing HFCs, PFCs and SF_6; • requiring leak monitoring on a regular basis, via detection equipment and inspections; • requiring leak testing and repair prior to top up of systems that have lost HFCs, PFCs or SF_6; • requiring the practice of recovering and recycling to the maximum extent feasible using appropriate recycling equipment; and • having a disposal plan which will eliminate the release of HFCs, PFCs and SF_6 into the ambient.	HEC shall submit to EPD for review, a detailed proposal 3 months before the commissioning of the first 300 MW gas-fired unit.	HEC	Submitted Report & On-site Records
	HEC shall explore the feasibility of adopting a comprehensive Life Cycle Management Program for SF_6 and the utilisation of SF_6 reclaiming and HFC/PFC recycling technologies.	ditto	ditto	ditto
	Flaring of operational, maintenance or accidental CH_4 emissions, is recommended, as the transformation to CO_2 results in lower GWP emissions. An efficiency rate of 95% shall be employed. The flaring system shall be designed with a capacity that can at least accommodate gas blow down of the entire pipeline, in case of an emergency.	HEC shall submit to EPD for review, a report of the proposed actions, including procedures to reduce emissions from maintenance, operations and emergencies, and other possible upgrading of CH_4 reduction, 3 months before the commissioning of the first 300 MW gas-fired unit.	HEC	Submitted Report & On-site Records

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Air Quality - operation (con't)	All new stationary and mobile air-conditioning systems shall use CFC-free refrigeration technologies.	see below	see below	see below
	All new fire fighting systems shall use halon-free suppressants.	see below	see below	see below
	The new extension shall be landscaped with trees and other suitable vegetation, as this shall increase the surrounding carbon sinks.	see below	see below	see below
	HEC shall implement a carbon accounting and monitoring programme, which shall include actions such as afforestation and reforestation.	HEC shall submit to EPD for review, a progress report on the above actions for a carbon accounting and monitoring programme 3 months before the commissioning of the first 300 MW gas-fired unit.	HEC	Submitted Report & On-site Records
	HEC shall undertake annual revisions and update of its GHG emissions inventory, which covers all HEC existing facilities and new extension, for at least the six GHGs specified under the Kyoto Protocol (CO_2, CH_4, N_2O, HFCs, PFCs and SF_6). The inventory shall be established and maintained in accordance with the latest IPCC Guidelines or any other guidelines issued by Government, with details documented for regular reviews and updates. The inventory shall be reported on an annual basis, including actual figures and targets for the previous and current years, as well as the next year's forecast. Discrepancies for actual versus target figures and actions for improvement or enhancement shall be discussed. HEC shall update the inventory according to the figures of the electricity load forecast, upon every subsequent review by the Government. This shall also be reported in the annual report.	An annual update of HEC's GHG inventory shall be submitted to EPD within 3 months of the end of the reporting period.	HEC	Submitted Report & On-site Records
Water Quality - construction	The following configurations and maximum rates of dredging shall be allowed :			
	• 3 large grab dredgers and 1 small grab dredger operating concurrently, each with rates of working of 12,000 m^3 day^{-1} and 8,000 m^3 day^{-1} respectively. During the flood phase of the tidal cycle the total number of large dredgers working shall be reduced by one, while during the ebb phase of the tidal cycle no reductions in the total number of dredgers shall be required.	During reclamation works phase	HEC and Construction Contractor	Construction Programme, contractual requirements and works method statements

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Water Quality - construction (con't)	• 1 trailer dredger with a rate of working of 8,000 m^3 day^{-1}, and 2 large grab dredgers, each with rates of working of 12,000 m^3 day^{-1}	During reclamation works phase	HEC and Construction Contractor	Construction Programme, contractual requirements and works method statements
	Silt curtains shall be installed on the eastern, southern and north western sides of the reclamation site during dredging for the reclamation construction. This is a required mitigation measure for the construction works and shall be implemented prior to the commencement of bulk dredging.	Prior to the commencement of dredging	HEC and Construction Contractor	Construction Programme, contractual requirements and works method statements
	As a necessary operational constraint combined bulk dredging and sand filling for site formation shall not be permitted at any time. In addition, sand filling for site formation shall take place behind constructed sea walls which pierce the water surface.	During site platform formation	HEC and the Construction Contractor	Contractual requirements and Works method Statements
	HEC shall ensure design to divert all storm drains away from Hung Shing Ye Bay*.	During design stage	HEC and the Construction Contractor	Design Drawings and Contractual Requirement
	Sand fill for the rubble mound seawalls shall be placed by controlled pumping down the trailer arm.	During seawall construction.	HEC and the Construction Contractor	Contractual requirements and Works method Statements
	EM&A shall confirm the acceptability of any impacts during construction and should any unacceptable impacts be found then one or more of the following mitigation measures shall be implemented.	In the event of an exceedance identified by the EM&A programme	HEC	Records generated by the implementation of the Event & Action Plan.

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Water Quality - construction (con't)	• reducing the number of dredgers working at any one time; • reducing the rate of working of the dredgers; • temporary suspension of operations; • phasing of the works so that dredging / filling is only undertaken at certain stages of the tidal cycle; In addition to the above specific measures the following general working procedures shall be adopted. • fully-enclosed, watertight grabs shall be used to minimise loss of sediment during the raising of loaded grabs through the water column; • the descent speed of grabs shall be controlled to minimise the seabed impact speed and to reduce the volume of over dredging; • barges shall be loaded carefully to avoid splashing of material; • all barges used for the transport of dredged materials shall be fitted with tight bottom seals in order to prevent leakage of material during loading and transport; • all barges shall be filled to a level which ensures that material does not spill over during loading and transport to the disposal site and that adequate freeboard is maintained to ensure that the decks are not washed by wave action; • the speed of trailer dredgers shall be controlled to prevent propeller wash from stirring up the sea bed sediments; • "rainbowing" sand fill from trailer dredgers shall not be permitted; and • the works shall cause no visible foam, oil, grease or litter or other objectionable matter to be present in the water within and adjacent to the dredging site and along the route to the disposal site.	During reclamation works phase	HEC and Construction Contractor	Contractual requirements and Works Method Statements

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Water Quality - construction (con't)	Cumulative impacts shall be assessed through EM&A. Coordination with the EM&A consultants for other projects to determine if any exceedances are caused by the other projects or by HEC's activities. Should monitoring results indicate exceedances at sensitive receivers due to HEC's activities, then the above described mitigation measures shall be implemented until impacts reduce to acceptable levels.	During reclamation works phase	HEC and Construction Contractor	Records generated by the implementation of the Event & Action Plan
Water Quality - operation	No further mitigation measures were found to be necessary provided the discharge of cooling water and residual chlorine are kept below the rates assumed in the water quality assessment*.			
	HEC shall, however, commit to examine the feasibility of lowering the residual chlorine concentrations for the Lamma Extension below the 0.3 mg L^{-1}, which was assumed in the water quality assessment. HEC shall further investigate the possibility of using alternative biocides.* The review shall be verified by the IEC and submitted to EPD 3 months prior to the operation of the first unit.	Design Phase	HEC and Design Consultant	In-house Report
	All Storm drains shall be diverted from the Hung Shing Ye Bay*.	Design Phase	HEC and Design Consultant	Design Drawings
	Design measures shall be implemented to discourage the formation of foam at the cooling water outfalls*.	Design Phase	HEC and Design Consultant	Design Drawings
	*All discharges of effluent/wastewater shall be controlled through licensing under the *Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters,* issued under Section 21 of the *Water Pollution Control Ordinance*.			
Noise - Construction	• General noise mitigation measures shall be employed at all work sites throughout the construction phase.	Throughout Construction Phase	HEC and Construction Contractor	Contractual requirements, Works Method Statements and EM&A Manual
	• Mitigate against general construction noise during Sunday's and public holidays, either at source with portable noise barriers, or by rescheduling of some PMEs to less sensitive time periods. @	Sunday's & Public Holidays	HEC and Construction Contractor	
	• Mitigate against night time noise from dredging equipment, with silencers or mufflers. @	Night time	HEC and Construction Contractor	
	Note : @ Regulated under the Noise Control Ordinance and subsidiary legislation.			

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Noise - Operation@	General			
	• HEC shall implement the gas-fired units for base-load operation to minimise the noise generated from the existing units.	Throughout the operational phase	HEC	On-site records
	• During the design phase, HEC shall deposit to the satisfaction of the DEP a noise control study report of the 1,800MW Gas-fired Power Station. The Report shall demonstrate the performance of the Power Station as a whole and individual plant shall meet the recommendations of the EIA Study. It shall reach EPD 3 months before HEC approve the design. The Report shall be certified by the HEC's Environmental Manager and verified by Independent Environmental Checker.	During the Design Phase. Report to be deposited to the EPD 3 months prior to design approval for each unit.	HEC's Design Consultants, Environmental Manager and Independent Environmental Checker	Design drawings and Contractual requirements
	The noise control study report shall include but not limited to the following key EIA findings:			
	Gas Turbine			
	• To mitigate for the residential communities to the east and north, ensuring that the Gas turbine intakes are oriented to the west.	Installed before commissioning test	HEC's contractor	Design drawings and Contractual requirements
	• To ensure the installation of high performance attenuators in the turbine intake duct.	ditto	ditto	ditto
	• The use of acoustic insulation around the external ducting between the turbine and the silencers.	ditto	ditto	ditto
	Note : @ Regulated under the Noise Control Ordinance and subsidiary legislation.			

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Noise - Operation[@] (con't)	*Gas Turbine Exhaust / HRSG*			
	• Ensure the installation of high performance silencers to the HRSG.	Installed before commissioning test	HEC's contractor	Design drawings and Contractual requirements
	• The use of acoustic insulation around the exhaust ducting between the turbine, silencer and HRSG.	ditto	ditto	ditto
	Gas & Steam Turbines / Generators			
	• Use of acoustic enclosures around major noise sources.	ditto	ditto	ditto
	Note : [@] Regulated under the Noise Control Ordinance and subsidiary legislation.			
Landscape & Visual impacts	The following mitigation measures shall be allowed for landscape and visual improvement:			
	• Use rubble mound seawall along south and west edges of the reclamation to provide a more natural look.	During Construction Phase	HEC and Construction Contractor	Master Layout Plan
	• Break the mass of main buildings by varying the height/division into smaller units.	During Construction Phase	HEC and Construction Contractor	Master Layout Plan
	• Plant trees and vegetation for screening.	During construction Phase	HEC and Construction Contractor	Master Landscape Plan
	• Adopt colour scheme to blend the buildings into the scenery.	During Construction Phase	HEC and Construction Contractor	Colour Scheme Proposal

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Marine Ecology	All percussive piling works shall be conducted on reclaimed land to avoid noise impact to marine mammals	During construction phase	HEC and Construction Contractor	Contractual requirement and works method statement
	All construction related vessels shall approach the extension site from the north and via the East Lamma Channel to avoid disturbance to the finless porpoise	During Construction phase	HEC and Construction Contractor	Contractual requirement and works method statement
	Rubble mound seawall to the south and west edges of the reclamation to enhance recolonisation of marine organisms	During Construction Phase	HEC and Construction Contractor	Contractual requirement and works method statement
	Artificial Reefs of a volume not less than 400 m^3 shall be deployed in a location to be decided upon consultation with the Director of Agriculture and Fisheries to serve the purpose of an Additional Habitat Enhancement Measure. The actual volume shall be decided based on the findings of the ecological monitoring programme.	A period of two years after construction of the extension rubble mound seawalls	HEC	Proposal to be submitted to EPD and AFD for approval once a site has been selected in consultation with AFD and the deployment volume has been decided.
Waste Management	HEC to submit a Waste Management Plan for the construction phase to EPD. The Plan shall be verified by the IEC and shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommendations of the EIA report.	Three months prior to the commencement of the construction works	HEC and Construction Contractors	Contractual requirements and Waste Management Plan
	HEC to submit a Waste Management Plan for the operation of the Lamma Extension to EPD. The Plan shall be verified by the IEC and shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the operation of the power station and shall take into account the recommendations of the EIA report.	Three months prior to the commencement of the first units of the power station	HEC	Self regulatory

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Waste Management (con't)	*Dredging Waste* • All vessels for marine transportation of dredged sediment shall be fitted with tight fitting seals to their bottom openings to prevent leakage of materials. In addition, loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water, and barges or hoppers should under no circumstances be filled to a level which shall cause the overflowing of materials or polluted water during loading or transportation.	Throughout the construction phase	HEC and their Construction Contractor	Contractual requirements and works method statements
	Storage, Collection and Transport of Waste • Minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers.	Throughout the construction phase	HEC and their Construction Contractor	Contractual requirements and works method statements
	• Obtain the necessary waste disposal permits from the appropriate authorities, if they are required, in accordance with the Waste Disposal Ordinance (Cap.354), Waste Disposal (Chemical Waste) (General) Regulation (Cap.354), the Crown Land Ordinance (Cap 28), Dumping at Sea Ordinance (Cap 466) and Work Branch Technical Circular No. 22/92, Marine Disposal of Dredged Mud. +	Throughout the construction phase	HEC and their Construction Contractor	Contractual requirements and works method statements
	• Disposal of waste at Licensed sites; ~	Throughout the construction phase	HEC and their Construction Contractor	Contractual requirements and works method statements

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Waste Management (con't)	• Develop procedures such as a ticketing system to facilitate tracking of marine mud and chemical waste (~ for chemical waste only), and to ensure that illegal disposal does not occur; • Segregate and sort the waste materials into 3 categories: - public fill (e.g. concrete and rubble) for re-use on-site or disposal at a public filling area; - re-use and/or recycling waste (e.g. steel and other metals); - waste which cannot be re-used and/or recycled (e.g. wood, glass and plastic) for landfill disposal. The sorting process shall be carefully monitored to avoid missing of the 3 categories. Different types of wastes shall be stockpiled and stored in different containers or skips to enhance re-use or recycling of materials and their proper disposal.	Throughout the construction phase	HEC and their Construction Contractor	Contractual requirements and works method statements
	• Maintain records of the quantities of wastes generated and disposed off-site for each category of waste.	Throughout the construction phase	HEC and their Construction Contractor	Contractual requirements and works method statements
	Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. ~ *Note:* ~ *Regulated under the Waste Disposal Ordinance and subsidiary legislation.* + *Regulated under the Ordinances and Administrative Rules cited.*	Throughout the construction phase	HEC and their Construction Contractors	Contractual requirements and works method statements

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Land Contamination	HEC shall submit a Land Contamination Avoidance Plan which shall take account of the recommendations of the EIA report to EPD. The Plan shall be verified by the IEC.	Three months prior to the commencement of the operation of the first unit of the power station.	HEC	Self regulatory
	The bunded area for light oil tanks shall be constructed in accordance with the Code of Practice for the Design Construction and Maintenance of Oil and Petroleum Feedstock Installations published by the Building Authority under the *Building (Oil Storage Installations) Regulations*.	Construction phase	HEC and their Construction Contractors	Contractual requirements and works method statements
	An oil leak detector with an alarm system shall be installed at the sump pit within the bunded area.	Construction phase, prior to commissioning test	ditto	ditto
	The light oil tanks shall be equipped with high level alarms to prevent overflow.	Construction phase, prior to commissioning test	ditto	ditto
	Maintain records of the following items: • integrity testing of light oil tanks; • daily inspection of the light oil tanks and bunded areas; • quantities of oily waste and sludge generated from oil interceptors and chemical waste generated from operation of the power station • disposal of oily waste/sludge and chemical waste to licenced site; • quantities of chemical and chemical waste • incidents of spillage and remediation actions; and • emergency response training and drills.	Operational phase	HEC	Self regulatory

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Risk (Fuel Gas Hazards)	Follow the guidelines in the UK Health and Safety Executive's *Interim Advice Note on Health and Safety in CCGT and CHP Plant* in developing the design of the gas turbine enclosure, ie: • avoid the need for acoustic enclosures, wherever reasonably practicable; • implement a Permit-to-Work system for any entry into an acoustic enclosure; • provide safe systems of work for investigation of fuel leaks within the enclosure (recognising that typical plant designs make off-load pressure testing or use of tracer gases difficult); • ensure adequate dilution ventilation, through competent design and verification by techniques such as smoke testing, air flow measurement, and use of Computational Fluid Dynamics (CFD); • minimise the chance of a fuel leak through minimisation of the number of joints, adherence to relevant standards for pipework, provision of fuel safety shut-off and vent valves with valve proving systems; • provide explosion relief/suppression systems where dilution ventilation is inadequate; and • conduct an engineering risk assessment to verify that the chosen means of control are effective.	During design and operation phases	HEC	Risk Assessment Report and Health and Safety Guidelines
	HEC shall review their existing safety management system against current best practice	During design, construction and operational phases	HEC	Safety Management System
Risk (Non-Fuel Gas Hazards)	Storage quantities of the non-fuel gas DGs shall be minimised as far as reasonably practicable. The design and operation of the various non-fuel gas DG facilities shall follow current best practice. Any significant reduction in separation distance between the locations of the various non-fuel gas DG facilities and the site boundary (ie a reduction which might reasonably affect the conclusions reached in the EIA Report) shall require review of the Hazard Assessment.	During design and operational phase	HEC	Health and Safety Guidelines and EIA Report

(1) Media or resources that is to be monitored or protected
(2) Measures/Actions to be adopted/undertaken
(3) When are such measures/actions to be implemented
(4) Who shall implement those measures or undertaken actions
(5) How shall implementation be checked; what records

1 *IMPLEMENTATION SCHEDULE*

1.1 *TRANSMISSION SYSTEM*

Table G2 Recommended Mitigation Measures and their Implementation

Parameter[1]	**Mitigation Measures**[2]	**Implementation**[3]	**Responsibility**[4]	**Audit**[5]
General	EM&A Requirements	The Construction & Operational Phase EM&A Manuals will be submitted to the DEP for approval 3 months prior to the commencement of construction works and the operation of the first 300MW unit respectively	HEC	EM&A Manual
Air Quality - Construction	To mitigate potential construction related dust impacts, the dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation shall be complied with, such as : • all debris or materials shall be either covered or stored in a sheltered debris collection area; and# • prior to any materials handling, all dusty material shall be sprayed with water.# *Note:* # *Regulated under the Air Pollution Control Ordinance & subsidiary legislation.*	Throughout construction phase of the land portion of transmission route	HEC Construction & Contractor	Contractual requirements, works method statements and EM&A Manual
Water Quality - Construction	No further mitigation measures were considered necessary.	-	-	-

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Noise - Construction	The following mitigation measures are recommended at the defined locations: N4-N5 Cable Route Selection and use of quiet PMEs, or use of modest source noise controls with standard PMEs; N5 Landing Point Selection and use of quiet PMEs (particularly the barge-mounted crane), or use of comparably effective source noise controls with the PMEs; For non-percussive piling - use of equipment with a SWL of 113 dB(A) or less if there is no programme overlap of the piling with the site formation works, otherwise offsetting source noise controls shall be required. For percussive piling - use of equipment with a SWL of 115 dB(A) or less, otherwise offsetting source noise controls shall be required. • If non-percussive piling and site formation activities are to be carried out simultaneously then careful equipment selection and source controls shall be required for both activities to reduce each by approximately 3dB(A). *Note:* • *Regulated under the Noise Control Ordinance and subsidiary legislation.*	Throughout construction phase	HEC and Contractor	Contractual requirements, works method statements and EM&A Manual
Marine Ecology	Construction of rubble mound seawalls for the landing and launching points at Lamma Island.	During construction phase	HEC and Contractor	None required

Table G2 - 2

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Terrestrial Ecology	Avoidance of impact on the uncommon and rare plant species *Celtis biondii* , *Pteris dispar* and *Ardicia pusilla*, and the restricted plants *Vitis balansaeana*, *Pterospermum heterophyllum* and *Rhapis excelsa*, by locating the landing points N4 & N5 and the connecting cable trough in areas outside where these plant species are located (Figures 9.4b & 9.4c, Part C, Volume 2), as well as close monitoring of the construction activity.	Prior to and during the construction works	HEC/ Contractor	Method Statement
	The erection of fences along the boundary of construction sites before the commencement of works to prevent tipping, vehicle movements, and encroachment of personnel into adjacent wooded areas, particularly where the rare, uncommon and restricted plant species are located.	ditto	ditto	ditto
	Regular checking to ensure that the work site boundaries are not exceeded and that no damage occurs to surrounding areas.	During the Construction phase	HEC/ Contractor	Method Statement
	The prohibition and prevention of open fires within the work site boundary during construction# and provision of temporary fire fighting equipment in the work area during construction.	ditto	ditto	ditto
	Note: # *Regulated under the Air Pollution Control Ordinance and subsidiary legislation.*			

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Landscape and Visual Impact	The visual impact of the Cable Landing Point I1 is considered negligible as it would have similar appearance as the existing sea wall and therefore no mitigation is required. The proposed landing points N2, N4 and N5, the following landscaping mitigation measures are recommended to minimise the potential impacts:	Throughout the construction phase	HEC and Construction Contractor	Landscape Plan
	• Although the size of the landing points varies (N2 is 26 x 70 m, N4 is 27 x 65 m and N5 is 33 x 56 m), each has a finished platform level at +6.00 mPD. With the Low Water Level at +1.00 mPD, the platforms shall be a maximum of some 5 m above the water level at low tide. In order to minimise the visual impact of the landing points, the exposed sides of the platforms and the cable slipways shall be screened with irregularly arranged boulders of varying sizes to mimic the natural coastline features. The horizontal platform surface shall be finished with natural materials such as stone pavings or tiles.	Throughout the construction phase	HEC and Construction Contractor	Landscape Plan
	• The cable trough in between Landing Points N4 and N5 is 5.5 m wide and 260 m long. The walkway that is formed above the cable trough shall be shielded by boulders (or, where practicable, shrub planting) from potential viewers from the sea and horizontal surfaces be finished with natural materials such as stone paving.	Throughout the construction phase	HEC and Construction Contractor	Landscape Plan

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Landscape and Visual Impact (con't)	• Appropriate compensatory landscaping shall be provided for any disruption to existing vegetation to blend in with the surrounding setting.	Throughout the construction phase	HEC and Construction Contractor	Landscape Plan
	• As a planning gain, parts of the landing points N4 and N5 and the cable trough between the landing points can be used for amenity and recreational purposes. Some low maintenance fixtures, matching with the natural environment, shall be built or placed on the landing points for public use. HEC shall resolve any management and maintenance requirements of the proposed mitigation measures during the processing stage of wayleave agreements. If required by Government, HEC commit to bear the management and maintenance responsibilities of these facilities.	Throughout the construction phase	HEC and Construction Contractor	Amenity Plan

(1) Media or resources that is to be monitored or protected
(2) Measures/Actions to be adopted/undertaken
(3) When are such measures/actions to be implemented
(4) Who will implement those measures or undertaken actions
(5) How will implementation be checked; what records

1 IMPLEMENTATION SCHEDULE

1.1 GAS PIPELINE

Table G3 Recommended Mitigation Measures and their Implementation

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
General	EM&A Requirements	The Construction & Operational Phase EM&A Manuals will be submitted to the DEP for approval prior to the commencement of construction works & operation of the first 300MW unit respectively	HEC	EM&A Manual
Air Quality	For the fuel gas supply system, equipment shall be chosen and measures taken, so as to prevent CH_4 leakage from the system. In accordance with this recommendation, HEC shall be implementing the following: • corrosion-preventing coatings on the pipeline; • welded pipe joints; and • laying of pipeline below sea bed such that it is well protected from potential damages by marine activities. HEC shall submit to EPD for review, a report of the above actions before the commissioning of the first 300 MW gas-fired unit.	3 months prior to commissioning of the first 300MW unit	HEC	Report
	Target reduction and achieved results of the above procedural control shall be reported in the annual inventory reports.	During the operational phase	HEC	Annual Inventory Reports

Parameter[1]	Mitigation Measures[2]	Implementation[3]	Responsibility[4]	Audit[5]
Water Quality - Construction	The following rates of dredging for the trenches at the Shenzhen and Lamma approaches and the rate of progress of the jetting shall be adopted: • a single small grab dredger with a maximum daily rate of working of 2,400 m^3 • maximum forward speed of the jetting machine should be 1 km per day	During reclamation works and jetting phases	HEC and Contractor	Construction Programme, contractual requirements and works method statements
	No further mitigation measures were considered necessary, however if unacceptable impacts were to be found in the course of the EM&A programme for the pipeline jetting, then the following measures shall be implemented: • reducing the speed of the water jetting machine; and • temporary suspension of the works.	In the event of exceedances identified by the EM&A programme.		Records generated by the implementation of Event & Action Plan
Marine Ecological Impacts	It is recommended that to avoid disruption to the *Neophocaena phocaenoides* population in the southwestern coastal waters of Lamma Island that works associated with the pipeline jetting do not occur during Spring off the coast of southwest Lamma.	During the establishment of the pipeline laying programme	HEC	Construction Programme
Hazards	Detailed quantitative risk study shall be conducted in accordance with the requirements in the Gas Safety Ordinance (Cap. 51) to satisfy EMSD's requirements which shall ensure adequate design of the pipeline to protect against third party damage and safe operation of the pipeline system.	Prior to pipeline commissioning	HEC	Quantitative Risk Assessment Report
	HEC shall review their existing safety management system against current best practice.	During design, construction and operational phases	HEC	Safety Management System

(1) Media or resources that is to be monitored or protected
(2) Measures/Actions to be adopted/undertaken
(3) When are such measures/actions to be implemented
(4) Who will implement those measures or undertaken actions
(5) How will implementation be checked; what records