Chapter 13

IMPLEMENTATION OF MITIGATION MEASURES

13 IMPLEMENTATION OF MITIGATION MEASURES

Table 13.1 Implementation Schedule for Land Contamination

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	SI/ Dem	Ex	Tre	
	Site decontamination and Soil remediation							
S.4.96 & S.4.214	• Where free product is detected at groundwater surface at during excavation, the free product shall be skimmed off, containerised and disposed of properly. Monitoring of free product and sampling/analysis of groundwater shall be conducted to ensure complete removal of the free product.	At CLS / During Soil Excavation	Contractor			✓		
S.4.97	• Where dewatering is necessary during excavation, the groundwater shall be recharged within 10m of the extraction point and below the water table. Regular monitoring of groundwater level at various locations shall be undertaken to ensure insignificant migration of contaminant in groundwater or soils due to locally risen groundwater level.	At CLS / During Soil Excavation	Contractor			✓		
S.4.95, S.4.222 & S.4.290	• Personal protective equipment (PPE) shall be used by site workers during soil excavation / free product skimming / groundwater dewatering.	At CLS / During Soil Excavation	Contractor			✓		
S.4.222	• Excavated areas shall be fenced off to restrict unauthorised entrance.	At CLS / During Soil Excavation	Contractor			✓		
S.4.158– S.4.160	• All contaminated soils at CLS shall be excavated and treated on site or transported out of the site for off-site treatment.	At CLS and/or TKW / During Design, Soil Excavation, & Soil Treatment	CED / Contractor	✓		✓	✓	

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Sl/ Dem	Ex	Tre	
S.4.158 & S.4.206-S.4.219	• After excavation, confirmation sampling and testing shall be conducted to ensure complete excavation of contaminated soils.	At CLS / During Design & Soil Excavation	CED / Contractor	✓		✓		
S.4.214	• Contaminated soils shall be sorted and handled with respect of their contamination.	At CLS / During Soil Excavation	Contractor			✓		
S.4.220	• Precautionary measures shall be implemented to avoid environmental nuisance during excavation.	At CLS / During Soil Excavation	Contractor			✓		
S.4.221-S.4.222	• Health and safety plan for excavation shall be followed.	At CLS / During Soil Excavation	Contractor			✓		Occupational Safety & Health Ordinance; Guidelines on Occupational Exposure
S.4.223-S.4.265	• The following remediation processes shall be applied for different types of soil contamination: – Biopiling for TPH/SVOCs contamination; – Cement solidification for metal contamination; and – Thermal desorption for dioxin contamination.	At CLS and/or TKW / During Design, Soil Excavation, & Soil Treatment	CED / Contractor	✓		✓	✓	
S.4.239-S.4.243	• Upon completion of biopile treatment, confirmation sampling and testing shall be undertaken for biopile closure assessment to ensure the cleanup targets have been attained.	At TKW / During Design & Soil Treatment	CED / Contractor	✓			✓	
S.4.251-S.4.256	• Upon completion of solidification treatment, confirmation sampling and testing shall be undertaken to ensure the cleanup targets have been attained.	At CLS & TKW / During Design & Soil Treatment	CED / Contractor	✓			✓	
S.4.265	• Upon completion of thermal desorption process, confirmation sampling and testing shall be undertaken to	At TKW / During Design & Soil	CED / Contractor	✓			✓	

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Sl/ Dem	Ex	Tre	
	ensure the cleanup target has been attained. • Mitigation measures for air quality and water quality impacts associated with the site decontamination and soil remediation works are presented in the relevant sections of this schedule.	Treatment						
S.4.290	Health and Safety Measures (General) • During the course of the site remediation, the following basic health and safety measures shall be implemented as far as practicable: – Set up a list of safety measures for site workers; – Provide written information and training on safety for site workers; – Keep a log-book and plan showing the contaminated zones and clean zones; – Maintain a hygienic working environment; – Prohibit eating and cooking inside the contaminated zones; – Avoid dust generation; – Provide face and respiratory protection gear to site workers; – Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and – Provide first aid training and materials to site workers.	At CLS & TKW sites / During Soil Excavation & Soil Treatment	Contractor			✓	✓	Occupational Safety & Health Ordinance; Guidelines on Occupational Exposure

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Sl/ Dem	Ex	Tre	
S.4.291-S.4.294	Personal Protective Equipment for Workers during Excavation of Dioxin-contaminated Soil The workers engaged in the excavation of dioxin-contaminated soil shall put on appropriate PPE to minimise the exposure to the carcinogens via inhalation, ingestion and dermal contact: • An air purifying respirator; • Latex gloves; • Protective clothing. If other contaminants are identified or the levels of contaminant are expected to be very high, a higher level of protection, such as self-supplied respirators, space suit, may be required.	At CLS / During Soil Excavation	Contractor			✓		Occupational Safety & Health Ordinance; Guidelines on Occupational Exposure
S.4.295	Safety Measures for Handling Dioxin-containing Residue Storage and conveyance of dioxin-containing residue shall be undertaken in accordance with the relevant Dangerous Goods Ordinance.	At TKW / During Soil Treatment	Contractor				✓	Dangerous Goods Ordinance

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.
* Des - Design, Slo/Dem – Slope Improvement and Building Demolition, Exc – Soil Excavation, and Tre – Soil Treatment

Table 13.2 Implementation Schedule for Air Quality Control

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S5.75	General Measures for Construction Sites • Dust mitigation measures stipulated in the *Air Pollution Control (Construction Dust) Regulation* shall be incorporated to control dust emission. Notice shall be given to the authority prior to commencing of work.	CLS, slope behind CLS and TKW / During building demolition, slope improvement soil excavation and setting up of treatment plant	Contractor		✓	✓	✓	Air Pollution Control (Construction Dust) Regulation
S5.76	Transportation from CLS to TKW • Dioxins contaminated soils shall be transported in enclosed roll-off truck with sealable top, which shall be delivered to enclosed material handling shed and storage areas. In addition, material handling process such as screening and crushing shall be conducted in an enclosed environment. • General contaminated soils transported to the storage bin at TKW by truck shall be properly covered with impermeable sheeting to minimize wind erosion and fugitive emission. The storage bin shall be fully enclosed on four sides and top to eliminate dust emission.	Haul road between CLS and TKW/ During soil transportation and unloading	Contractor			✓	✓	
S5.76	Soil Excavation • Excavation of dioxins contaminated soils shall be limited to 200 m^3/hr; whereas excavation of styrene and chromium VI contaminated soils shall be limited to 20 m^3/hr. • The top layer soils shall be sprayed with fine misting of water immediately before the excavation. • Inactive excavated area shall be covered by	At CLS site / During soil excavation	Contractor			✓		--

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	impermeable sheeting to minimise dust emissions.							
S5.77-S5.79	Solidification • Temporary stockpiles shall be covered by impermeable sheets to minimize wind erosion. • Handling and mixing of cement shall follow Air Pollution Control (Construction Dust) Regulation to limit cement emission.	At CLS and TKW site / During soil treatment	Contractor				✓	Air Pollution Control (Construction Dust) Regulation –
	• Mixing process at TKW shall be conducted in enclosed area.	At TKW site / During soil treatment	Contractor				✓	
	Biopiling • Emission characterisation study to identify exact concentration of individual species of VOCs. • Biopiles shall be at all times covered by impermeable sheeting to prevent wind erosion. • TOC emission to the atmosphere shall be limited to 20mg/m^3, with maximum flow of no more than 56 m^3/min, expressed at 298K, 1 atmosphere, dry and 11% oxygen content condition.. • Carbon absorber with 99% control efficiency shall be installed to ensure TOC level of off-gas comply with the emission limit before discharged.	At TKW site / During soil treatment	Contractor				✓	
	Thermal desorption • Gaseous fuel shall be used for thermal desorption • The thermal desorption shall be of enclosed process. • The flue stack shall be of at least 10m high. • The following emission limits (expressed at 298K, 1 atmosphere, dry and 11% oxygen content condition) from the thermal desorption process shall be satisfied; – 0.1ng/m^3 for dioxin;	At TKW site / During soil treatment	Contractor				✓	

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	– 20mg/m^3 for TOC; and – exhaust gas flowrate of no more than 60m^3/min. • The air treatment unit associated with the thermal desorption facility shall allow no more than 0.0001% of SVOC, PAHs and dioxins from the soils, escaped as gaseous pollutants. • Approval from authority is required for installation of chimney with gaseous consumption rate more than 1150 MJ/hr							Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alternation) Regulation

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.
* Des - Design, Slo/Dem – Slope Improvement and Building Demolition, Exc – Soil Excavation, and Tre – Soil Treatment

Table 13.3 Implementation Schedule for Water Quality Control

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S7.70 – S7.73	**Building Demolition, Slope Improvement, Soil Remediation Plants Construction and Remediation Plant s Decommissioning** Surface Run-off Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks. Surface run-off from the construction sites shall be directed into storm drains via adequately designed wastewater treatment facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such facilities Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. Open stockpiles of demolition materials on site shall be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms. Measures shall be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. Manholes (including any newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system.	1. Building demolition at CLS 2. Slope Improvement behind CLS 3. Remediation Plant Construction at TKW 4. Remediation plant decommissioning at TKW	Contractor		✓ ✓		✓ ✓	EIAO-TM, WPCO

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	Wheel Washing Water							
S7.74	All vehicles and plant shall be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay shall be provided at every site exit, if practicable, and wash-water shall have sand and silt settled out or removed before being discharged into the storm drains. In any case, discharge of wheel wash water shall be minimised and recycled where possible. The section of construction road between the wheel washing bay and the public road shall be paved with backfill to reduce vehicle tracking of soil and to prevent surface run-off from entering public road drains							
	Wastewater from Site Facilities							
S7.75	Shall the use of chemical toilets be necessary then these shall be provided by a licensed contractor, who will be responsible for appropriate disposal and maintenance of these.							
	Storage and Handling of Oil, Other Petroleum Products and Chemicals							
S7.76	All fuel tanks and chemical storage areas shall be provided with locks and be sited on sealed areas. The storage areas shall be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters. The Contractors shall prepare guidelines and procedures for immediate clean-up actions following any spillages of oil, fuel or chemicals.							

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S7.77	Wastewater Treatment Facilities Sufficient wastewater treatment facilities shall be provided to treat the surface runoff and wheel wash water to the discharge standards as stipulated in the *Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*. In addition, discharge licence under the *Water Pollution Control Ordinance* shall be obtained for any discharge of treated runoff and wheel wash water to the environment.							
S7.79 – S7.81	**Soil Remediation** Excavation and Dewatering at CLS All exposed pits shall be whenever possible backfilled immediately or covered and bunded. Further, all excavated soil shall be loaded into dump truck directly to avoid stockpiles of contaminated soil next to excavation pits Final surfaces after excavation shall be well compacted and the subsequent permanent work or surface protection shall be carried out as soon as practical after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within the trenches or footing excavations. The contractor shall develop contingency plans for capture and control of any runoff prior to backfill during runoff-producing rainfall events.	Soil excavation at CLS	Contractor			✓		--

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	Groundwater drawn from the dewatering process during excavation and rainwater collected within the trenches or excavation pits shall be pumped out and recharged back the ground in the vicinity.							
S7.83 – S7.85	<u>Operation of the Solidification Facility</u> The designated stockpiling area before incepting contaminated soils shall be concrete-paved or lined with impervious floor membrane and shall have its perimeter constructed of a concrete bund in order to avoid any contaminated leachate from migrating out of the area. The leachate shall be collected and treated prior to disposal. Temporary stockpiles upon formation shall be immediately covered with low permeability cover to stop precipitation from washing the contaminated soil thus generating contaminated runoff. The contractor shall formulate contingency plans for the runoff collection and control. The solidification facility shall be sheltered and area of soil unloading/ loading shall be provided with shed to avoid contaminated runoff. Excessive addition of water during the process shall be avoided during the process. As an additional measure, any pits used for solidification area shall be shallower than the water table to minimize the leaching of the contaminated soils. And a impermeable membrane/sheet shall be placed at the bottom of any solidification pit during the solidification process	Operation of the solidification facility at CLS	Contractor				✓	--

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S7.86	Decontamination Water and Wheel Wash Water During soil excavation, dump trucks or excavators shall be decontaminated before they leave the site to ensure that no contaminated earth, mud or debris is deposited by them on roads. A wheel washing bay shall be provided at every site exit that equipped with an adequately sized centralised wastewater treatment unit. The wastewater treatment unit shall deploy flocculation/ sedimentation and activated carbon filtering by which processes sands/ silts with dioxin cohered are to be settled out and other soil contaminants in wheel washes and decontamination water removed. The polluting parameters in effluent shall comply with TM discharge standards and dioxin in effluent shall be cleared of to an undetectable range before the effluent being discharged into the storm drains. The installation and operation of the wastewater treatment unit shall be licensed and subject to the effluent monitoring as required under the *Waste Disposal Ordinance*. In any case, discharge of wheel wash water shall be minimised and recycled where possible. The section of construction road between the wheel washing bay and the public road shall be paved with backfill to reduce vehicle tracking of soil and to prevent surface runoff from entering public road drains.	Soil excavation at CLS	Contractor			✓		EIAO-TM, WDO
S7.89- S7.90	Biopiling Impermeable liner shall be placed at the bottom of the biopiles and leachate collection sump shall be constructed along the perimeter of the biopiles to prevent leachate from contaminating the underlying soil/groundwater. Concrete bund shall be constructed along the perimeter of biopiles to prevent the runoff coming out from the	Soil treatment at TKW	Contractor				✓	EIAO-TM, WDO

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	contaminated soil. All leachate collected shall be treated in a centralised wastewater treatment unit. The wastewater treatment unit shall deploy flocculation/ sedimentation and activated carbon filtering by which processes sands/ silts with dioxin cohered are to be settled out and other soil contaminants in wheel washes and decontamination water removed. The polluting parameters in effluent shall comply with TM discharge standards and dioxin in effluent shall be cleared of to an undetectable range before the effluent being discharged into the storm drains. The installation and operation of the wastewater treatment unit shall be licensed and subject to the effluent monitoring as required under the *Waste Disposal Ordinance* Biopiles after formation and during rain shall be covered by anchored impermeable geotextiles to prevent contaminated runoff. The exposed biopile section at any time shall not be more than 5m in length.							
S7.91	Thermal Desorption The storage bin for the dioxin-contaminated soils shall be sheltered and bottom lined to prevent generation of contaminated runoff. The storage bin shall be equipped with leachate sump to collect any leachate from the soil stack and subsequently the leachate will be treated in the centralised wastewater treatment unit before discharging. Concrete bund and adequately sized sump shall be constructed at the perimeter of thermal desorption plant to collect any runoff within the plant to cater occasionally very heavy downpour during the remediation period. The runoff from the desorption plant of the first 30 minutes of a rainstorm is considered to be contaminated and shall be collected and treated in the centralised wastewater	Soil treatment at TKW	Contractor				✓	EIAO-TM, WDO

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	treatment unit. The wastewater treatment work shall contain sedimentation, filters, coagulation/ flocculation unit and activated carbon adsoption. The treatment plant will be subject to the effluent monitoring requirement under the *Waste Disposal Ordinance*. . All non-aqueous condensates from the thermal desorption processes shall be stored in sealable, leak-proof containers for off-site disposal. The aqueous phase of the condensate shall be used to quench the thermally-treated soil and rehumidify it to reach a specified moisture content. Excessive aqueous product shall be treated in the wastewater treatment unit before discharged. No direct discharge of excessive aqueous product into the local drains or drainage channel shall be allowed.							
S7.92 – S7.93	Solidification The solidification facility shall be sheltered and area of soil unloading/ loading shall be provided with shed to avoid contaminated runoff. Excessive addition of water during the process shall be avoided during the process. As an additional measure, Any pit used for solidification area shall be shallower than the water table to minimize the leaching of the contaminated soils. And a impermeable membrane/sheet shall be placed at the bottom of any solidification pit during the solidification process..	Soil treatment at TKW	Contractor				✓	EIAO-TM

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.
* Des - Design, Slo/Dem – Slope Improvement and Building Demolition, Exc – Soil Excavation, and Tre – Soil Treatment

Table 13.4 Implementation Schedule for Waste Management

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S6.76	Good Site Practice and Waste Reduction Measures • Recommendations for good site practice during the decommissioning and demolition activities: – Use waste haulier authorised or licensed to collect specific category of waste; – Obtain the necessary registration and licences under the *Waste Disposal Ordinance* and the *Waste Disposal (Chemical Waste) (General) Regulation* from the Environmental Protection Department; – Nomination of an approved person, such as a site manager, to be responsible for good site practice, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; – training of site personnel in proper waste management and chemical waste handling procedures; – provision of sufficient waste disposal points and regular collection for disposal; – appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; – separation of chemical wastes for special handling and appropriate treatment at a licensed facility; – regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; – a recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites);	CLS, slope behind CLS and TKW / During building demolition, slope improvement, soil excavation and soil treatment	Contractor		✓	✓	✓	Waste Disposal Ordinance (Cap. 54)

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	– In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and control fly-tipping, a trip-ticket system shall be included as one of the contractual requirements and implemented by the Environmental Team. One may make reference to WBTC No. 5/99 for details; and – A Waste Management Plan (WMP) shall be prepared and this WMP shall be submitted to the Engineer for approval. One may make reference to WBTC No. 29/2000 for details.							
S6.77	• The following measures shall be implemented where applicable: – segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; – to encourage collection of aluminium cans, paper waste and plastic bottles by individual collectors, separate labelled bins shall be provided to segregate this wastes from other general refuse generated by the work force; – any unused chemicals or those with remaining functional capacity shall be recycled; – use of reusable non-timber formwork to reduce the amount of C&D material; – prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill; – proper storage and site practices to minimise the potential for damage or contamination of	CLS. slope behind CLS and TKW / During building demolition, slope improvement, soil excavation and soil treatment	Contractor		✓	✓	✓	Waste Disposal Ordinance (Cap. 54)

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	construction materials; and – plan and stock construction materials carefully to minimise the amount of waste generated and avoid unnecessary generation of waste.							
S6.79	Waste Recycling • To minimise the amount of waste disposal to landfill, the general refuse (not contaminated) shall be reused and recycled as much as practical. Waste sorting and segregation shall be carried out in accordance with the following categories for recycling: – Plastic (i.e. plastic bag, plastic bottle, plastic packaging, etc.) – Rubber; – Paper; – Wood/ timber; – Glass; – Textile; and – Metal (i.e. aluminium can, steel metal, ferrous metal, and non-ferrous metal).	CLS, slope behind CLS and TKW / During building demolition, slope improvement, soil excavation and soil treatment	Contractor		✓	✓	✓	-
S6.37 – S6.38, S6.81 – S6.85	Chemical Waste • The Contractor shall register with EPD as chemical waste producer. • To maximise the opportunity for recycling/ reuse, during the decommissioning stage, recoverable chemical wastes (in particular oil, paint and solvent) shall be separated from the rest and collected by licensed collector for recovery at licensed plant. • The chemical waste, including asbestos wastes, shall be separated from non-chemical waste. Workers involved	CLS, slope behind CLS and TKW / During building demolition, slope improvement, soil excavation and soil treatment	Contractor		✓	✓	✓	Waste Disposal Ordinance and Waste Disposal (Chemical Waste) (General) Regulation.

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	in the handling of chemical waste shall be suitably trained and shall wear appropriate protective masks and clothing when handling such materials. Chemical wastes shall be handled according to the *Code of Practice* on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals shall be stored and collected by an approved operator for disposal at a licensed facility in accordance with the *Chemical Waste (General) Regulation*. • Containers used for storage of chemical waste shall: – Be suitable for the substance they are holding, resistant to corrosion, maintained in good condition, and securely closed. – Have a capacity of less than 450 litres unless the specifications have been approved by the EPD. – Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations. • The storage area for chemical waste shall: – Be clearly labelled and used solely for the storage of chemical waste. – Be enclosed on at least 3 sides. – Have an impermeable floor and bunding, of capacity to accommodate 100% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest. – Have adequate ventilation. – Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary). – Be arranged so that incompatible materials are adequately separated. • Disposal of chemical waste shall:							

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	– Be via a licensed waste collector. – Be at a facility licensed to receive chemical waste, such as CWTC which offers a chemical waste collection service and can supply the necessary storage containers. – Be a recycler of the waste, with waste disposal licence from the EPD.							
S6.86	<u>C&D Material</u> • The Contractor shall separate the C&D material including steel, timber and scrap metals from other wastes, as far as practical, and shall arrange for recycling and reuse on site to the extent possible. All C&D materials arising from demolition work shall be sorted on-site and be separated into different groups for disposal at landfills, PFAs, or recycling as appropriate in accordance with *WBTC No. 5/98*. Due to limited space at landfills, disposal at reclamation sites or PFAs would be the preferred option. A trip-ticket system for disposal of C&D material as detailed in *WBTC No. 5/99* shall be followed. Finally, a method statement for the sorting, processing and disposal of C&D materials arising from demolition work shall be submitted by the Contractor to the Engineer for his approval.	CLS, slope behind CLS and TKW / During building demolition, slope improvement, soil excavation and soil treatment	Contractor		✓	✓	✓	Waste Disposal Ordinance (Cap. 354); New Disposal Arrangements For Construction Waste (1992); WBTC No. 5/98, On Site Sorting Of Construction Waste On Demolition Sites.
S6.87 – S6.89	<u>Contaminated Residues</u> • Building sampling shall be carried out prior to demolition to characterise the contaminants present on the building surfaces and identify suitable reagents for decontamination. After contaminants characterisation, a Decommissioning Plan shall be prepared by the	At CLS site / During building demolition	Contractor		✓			Waste Disposal Ordinance (Cap. 354)

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	specialist Contractor recommending the indoor remediation protocols as well as the demolition method for the Engineer's approval. Scabbling is the preferred method of cleaning. • Adequate on-site supervision by competent personnel is required. • After completion of building decontamination, the material can be discarded as normal C&D waste. The chemical deposits or residues from scabbling will be disposed of to CWTC.							
S6.90 – S6.91	General Refuse • General refuse shall be stored in enclosed bins or compaction units separated from C&D material and chemical wastes. No open stockpile of general refuse is allowed on site to minimise environmental impacts. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material and chemical wastes, on a daily or every second day basis to minimise odour, pest and litter impacts. • Aluminium cans, paper waste and plastic bottles are often recovered from the waste stream by individual collectors if they are segregated or easily accessible, so separate labelled bins for their deposit shall be provided if feasible. Site office waste can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme shall be considered if one is available.	CLS, slope behind CLS and TKW / During building demolition, slope improvement, soil excavation and soil treatment	Contractor		✓	✓	✓	Waste Disposal Ordinance (Cap. 354); New Disposal Arrangements For Construction Waste (1992); WBTC No. 5/98, On Site Sorting Of Construction Waste On Demolition Sites.

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S6.92 – S6.93	Slope Works behind CLS • The excavated soil and rock shall be disposed of to PFAs. In addition, a Waste Management Plan shall be prepared by the Contractor in order to keep waste arising to a minimum and to ensure that waste is handled, transported and disposed of in a suitable manner. • The design of slope work shall be planned carefully to maximise the preservation of existing profiles with stabilisation as necessary to minimise cutting.	At slope behind CLS/ during slope improvement	Contractor		✓			-
S6.94	Land Formation • The C&D material generated from this Project shall be reused/ recycled as far as practicable in the land formation works within CLS site so as to minimise the amount of C&D material to be disposed of at PFAs.	CLS, slope behind CLS and TKW / During building demolition, slope improvement	Contractor		✓			-
S6.95 – S6.96	Soil Excavation at CLS • The buried chemical wastes shall be handled in compliance with the provisions of *Chemical Waste Regulations*. The site contractors, workers and operatives shall also be required to follow appropriate procedures on handling chemical wastes according to the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* and with the *Code of Practice on the* Handling, *Transportation and Disposal of Asbestos Waste* for asbestos wastes.	At CLS site / During soil excavation	Contractor			✓		Waste Disposal (Chemical Waste) (General) Regulation (Cap 354); Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S6.98	Collection and Transportation of Wastes • Dump trucks will be extensively used for the transit of waste, other than material contaminated with dioxin which will be transported by roll-off trucks between the excavation area and TKW. The following precautionary measures shall be taken to avoid spillage, wind erosion and incident in transit. – Transportation of contaminated soil shall be escorted to improve road safety; – The haul road shall be properly illuminated if there are any night works. – Strict speed limit (50km/hr.) shall be imposed on the whole length of the haul road; – Never overload the dump truck to prevent spillage of contaminated soil; – Dioxin-contaminated material shall be transported in roll-off trucks with sealable top; – Always cover the payload on each dump truck with strong and impermeable sheeting to withstand wind and rain while the truck is travelling; – Adequately but not excessively wet the payload to check the dust generation.	From CLS to TKW site / During soil excavation and soil treatment	Contractor			✓	✓	-
S6.99 – S6.101	• As dioxin-contaminated soil is classified as chemical waste, the trucks shall be labelled, handled and transported in accordance with the *Waste Disposal Ordinance* and the *Waste Disposal (Chemical Waste) (General) Regulation*. In addition, Chemical Waste Collection Licence under S.21 of the Waste Disposal Ordinance shall be obtained for the collection and transportation of such chemical waste. When the trucks	From CLS to TKW site / During soil excavation and soil treatment	Contractor			✓	✓	Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	approach the TKW Site, they will approach from west well clear of the east side of the site thereby avoid disturbance to the area where the group of egrets was sighted. • Dioxin condensate (oily residue) generated from the thermal desorption plant shall be transported in heavy duty and sealable drums, which will then be collected by CWTC's own fleets which are designed and licensed for the collection of hazardous and chemical wastes. • A contingency plan shall be prepared by the Contractor to spell out the necessary procedures to be taken and in case of accident and/ or emergency when transporting the contaminated soil to off-site location(s). All responsible parties and/ or persons and their contact numbers shall be listed in the plan.							
S6.103 – S6.106	<u>Material Handling and Transportation</u> • The general contaminated material in the trucks shall be covered with impermeable sheeting (i.e. HDPE) to prevent ingress of rainwater during transportation. Movements by sea of material contaminated with heavy metals, PAH and TPH could use self-propelled barges. • For material contaminated with dioxin, roll-off trucks (with sealable top) are recommended to minimise the risk of material loss during material handling and transportation, particularly in the event of an incident. Direct loading of material into containers at the point of excavation is recommended to minimise double handling and any associated losses.	From CLS to TKW site / During soil excavation and soil treatment	Contractor			✓	✓	-
S6.107 – S6. 116	<u>Storage</u>	At TKW site/ During soil	Contractor				✓	-

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	• The stockpile shall be formed on a paved area. To reduce air quality impact, the storage area shall be roofed. The roof structure shall be in place prior to the deposition, storage or removal of material from the storage building. • For the bulk storage of general contaminated material for solidification only, a stockpile is proposed for storage up to an overall height of 5 metres over a net storage area of 1.0ha. Material stored to the design height shall be covered using a impermeable sheeting.	treatment						
S6.117	Treatment Area • The containment structure and concrete floor at the treatment site shall be decontaminated after completion of remediation. It is recommended that these structures be decontaminated by scabbling and then be discarded as normal C&D material. The chemical deposits or residues from scabbling will be disposed of at CWTC for ultimate disposal.	At TKW site / During soil treatment	Contractor				✓	Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)
S6.118 – S6.119	Off-Site Decontamination Works • All soils after treatment will turn to clean inert materials suitable for public filling. The condensate as the end product of the thermal desorption process and other chemical wastes (e.g. spent activated carbons & filters) generated shall be temporarily stored in a secure hut. Such waste will be collected by licensed collectors and disposed of at the CWTC to avoid bulk storage at treatment site. Pending collection, the chemical waste shall be packaged and where necessary stored	At TKW site / During soil treatment	Contractor				✓	Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	temporarily on-site in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation.* • Prior arrangement with CWTC shall be made to avoid compromising the daily operation of CWTC.							
S6.120	Off-Site Decontamination Works • A batch of the oily condensate will be sent to CWTC for a performance test and treatment shall begin only after performance tests have been passed. • Treatment of condensate shall be in batches with a campaign every week or every two weeks.	At TKW site / During soil treatment	Contractor				✓	-
S6.121	Precautionary Measures during Wet and Typhoon Seasons • Surface runoff from the treatment site shall be directed into storm drains via adequately designed sand/ silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such site removal facilities. • Catch-pits and perimeter channels shall be constructed in advance of site preparation works. • Open stockpiles on site shall be covered with tarpaulin during rainstorms. Measures shall be taken to prevent the washing away of soil into any drainage system. • The storage area for excavated soil from CLS shall be roofed and covered. In addition, run-on/ run-off control elements shall be constructed. Finally, the floor shall be concrete paved. • A dedicated wastewater treatment unit shall be constructed for the treatment of contaminated run-off, leachate collected and decontamination water	At TKW site / During soil treatment	Contractor				✓	-

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S6.122 – 6.125	Equipment Decontamination Requirement • For excavation and transport equipment at the CLS or treatment site, if it stays within the contaminated zone, such as excavation and stockpiling areas, it shall be decontaminated (typically steam cleaning) prior to leaving the contaminated zone. The contaminated zone shall need to be clearly defined with fencing. The exit of the contaminated zone shall have a decontamination pad for cleaning of the equipment before it leaves the zone. The decontamination water shall be collected and disposed of at the on-site wastewater treatment unit. Care shall be exercised by the Contractor to prevent contamination of areas outside the contaminated zone. • In treatment area, particularly for a large-scale ongoing operation, separate equipment shall be employed for transport of treated materials to prevent any potential for recontamination. A "contaminated" loader shall load only the contaminated soils into the decontamination system, and a "clean" loader shall be assigned to remove the treated soils from the stockpile at the outlets of the decontamination systems. • Lining of trucks with plastic is recommended to prevent spills and leakage during transport. Besides, draping of plastic over the sides of trucks can minimise the amount of soil accumulates on the outside of the body. For transport within the contaminated zone, the cover fabrics/ plastic sheeting can be reused depending on the truck and cover configuration, otherwise they shall be dumped into landfill. • No water discharge is allowed prior to on-site treatment.	From CLS to TKW site / During soil excavation and soil treatment	Contractor			✓	✓	Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.
* Des - Design, Slo/Dem – Slope Improvement and Building Demolition, Exc – Soil Excavation, and Tre – Soil Treatment

Table 13.5 Implementation Schedule for Ecological Impact

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S8.78-S8.94 S8.135-S8.139	Impacts to restricted / protected plant species • Where possible, restricted/protected plant species are to be preserved *in situ*. Areas supporting the highest concentrations of restricted or protected species have been fenced off to prevent tipping, vehicle movement and encroachment of personnel into these areas. • Plants directly affected by the proposed works will be transplanted to suitable receptor sites that have been identified at Tai Tam Country Park. To maximize the transplantation success, seeds will be collected prior to transplantation and kept in specialist storage facilities. In case the transplantation is unsuccessful, the stored seeds will be germinated and cultivated, and reintroduced to the receptor sites. A 3-year post-transplantation monitoring will be undertaken to ensure successful establishment of the plants concerned.	Behind CLS and near MTHS / During building demolition, slope improvement and soil excavation	Contractor		✓	✓		Forests and Countryside Ordinance (cap. 96) Animals and Plants (Protection of Endangered Species) Ordinance (Cap. 187) Country Parks Ordinance (Cap. 208)
S8.95-S8.115.	Impacts to MTHS and Rice Fish population • The lower course of MTHS will be affected by the proposed works at Cheoy Lee. Mitigation measures will focus on re-creating a suitable habitat of the Rice Fish further upstream of MTHS, where impacts arising from construction works to the re-created habitat is minimal. More detailed surveys of the Rice Fish will be carried out prior to the commencement of fill works. • If Rice Fish are found in future surveys, they shall be temporarily relocated to holding aquaria. A recreated habitat suitable for the fish shall then be constructed at MTHS, and the fish returned to the habitat. Maintenance of the holding facilities and care for the captive fish will	At MTHS / During building demolition, and soil excavation	Contractor		✓	✓		-

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
	be undertaken prior to relocation to the re-created habitat. • If no Rice Fish are found in future surveys, it may be possible to source a captive population, and re-introduce the fish to a re-created habitat at MTHS. Post relocation monitoring of the Rice Fish in the re-created habitat will be undertaken. • Incorporation of environmentally friendly design of the future drainage channel to encourage recolonisation of the lower stream fauna.							
S8.118	The following measures will be implemented to reduce disturbance to the coastal area of TKW in view of the previous incidental sighting of a small population of ardeids: - The construction of biopiles (where high levels of activity may disturb the birds) shall take place from October-February, outside of the Ardeid breeding season; - Thermal Desorbers shall be placed at the west of the site, as far from potential nesting sites as possible	At TKW site / During soil treatment	Contractor				✓	-
S8.117	<u>Other Mitigation Measures</u> • All potentially harmful contaminants from CLS shall be handled, treated and disposed of in an appropriate manner; to minimise risks to human health and flora and fauna.	At CLS site / During decommissioning	Contractor			✓	✓	-

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S8.119-S8.121	Fill / Slope works • Shotcrete shall not be used for the slope works. The design of slope works shall make reference to the GEO Publication No. 1/2000 "Technical Guidelines on Landscape Treatment and Bioengineering for Man-made Slopes and Retaining Walls". • Works on slopes supporting natural vegetation shall be minimised as far as slope safety standards allow. • Hydroseeding and planting of trees and shrubs including native species will be undertaken on newly created slopes.	At slope behind CLS / During slope improvement	Contractor		✓			Technical Guidelines on Landscape Treatment and Bioengineering for Man-made Slopes and Retaining Walls.
S8.122-S8.130	General Mitigation Measures • Before commencement of works, staff shall be informed by the Site Engineer of the conservation significance of restricted/protected plant species directly impacted by the development. • Placement of equipment or stockpile in the work areas and access routes shall be selected on existing disturbed land to minimise disturbance to natural habitats. • Construction activities shall be restricted to the work areas that shall be clearly demarcated. • The work areas shall be reinstated immediately after completion of the works. • Waste skips shall be provided to collect general refuse and construction wastes. The wastes shall be disposed of timely and properly off-site. • Drainage arrangements shall include sediment traps to collect and control construction run-off. • Open burning shall be strictly prohibited.	All works sites / During all work phases	Contractor		✓	✓	✓	-

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.
* Des - Design, Slo/Dem – Slope Improvement and Building Demolition, Exc – Soil Excavation, and Tre – Soil Treatment

Table 13.6 Implementation Schedule for Cultural Heritage Impact

EIA Ref#	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	Slo/ Dem	Exc	Tre	
S9.23 – S9.28	• Impermeable sheeting shall be used to cover the archaeological potential site for areas where are not subject to rescue excavation. • Detailed design of filling work or ground level adjustment work shall consider diversion of site runoff to prevent any waterlogged conditions.	At CLS site / during design and building demolition	CED, Contractor	✓	✓			-
S9.23-S9.28	The impacted area shall be mitigated by rescue excavation prior to decontamination works. The rescue excavation team shall adopt the following procedures to ensure the safe and healthful work environment. • Smoking, open flames and the carrying of matches and lighters is not allowed in the rescue areas; • Personal protective clothing shall be worn by the team members at all time; • Respirator and gloves for vapour exposure protection shall be worn during excavation; • Impermeable liners shall be placed at the bottom of the stockpile to prevent leachate from contaminating the underlying soil/groundwater; • Inactive excavated area shall be covered with low permeable sheet; • Any material shall be backfilled on site after completion of the rescue works; • Temporary stockpiles beside excavation areas shall be covered by impermeable sheet to prevent dust emission and contaminated runoff.	At CLS site / During building demolition	AMO		✓			-
S9.23	• On-site monitoring	At CLS/ During building demolition and soil excavation	AMO		✓	✓		

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.
* Des - Design, Slo/Dem – Slope Improvement and Building Demolition, Exc – Soil Excavation, and Tre – Soil Treatment