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1 BACKGROUND

- 1.1.1 The Diamond Hill Crematorium (hereafter referred as the Existing Crematorium) has been catering for the cremation services in Kowloon since 1979. The six existing cremators are now approaching the end of their serviceable life and hence the Food and Environmental Hygiene Department (FEHD) proposes to demolish the Existing Crematorium as well as to construct and operate a new crematorium (hereafter referred to as the New Crematorium) *in situ* as a replacement (hereafter referred to as this Project).
- 1.1.2 The Architectural Services Department (Arch SD) is the works agent for implementing the Project. After completion of construction works, the new cremators will be handed over to FEHD for operation.
- 1.1.3 Based on the definition laid down under the Environmental Impact Assessment Ordinance (EIAO) and the Project nature, two designated projects (DPs) requiring environmental permit are identified. One DP falls into EIAO *Schedule 2, Part II, Item 3*, which is the decommissioning of a clinical waste incinerator, as the Existing Crematorium once dealt with non-infectious amputated body parts, which is classified as clinical waste under the “Practice Note on the Disposal of Clinical Waste at Landfills”, from hospitals during the period from 1994 to 2001. The other DP falls into category *N4* of EIAO *Schedule 2, Part I*, which is the construction and operation of the New Crematorium. The Environmental Impact Assessment (EIA) Study Brief (ESB-102/2002) issued by Environmental Protection Department (EPD) requires assessment of environmental impacts and recommendation of appropriate mitigation measures, where necessary, for the two DPs. The Hong Kong Productivity Council supported by Townland Consultants Ltd., Scott Wilson (Hong Kong) Ltd. and Atkins China Ltd. was commissioned by Arch SD to conduct the EIA Study. The detailed EIA results and recommendations are documented in the EIA Report while this Executive Summary serves to present the key EIA findings.

2 PROJECT DESCRIPTION

2.1 Needs for the Project

- 2.1.1 After long years (over 24 years) of cremator operation in the Existing Crematorium, the downtime incurred due to frequent faults (about 2 fault incidents every week) and associated repair works from April 2002 to March 2003 amounted to 7.4% of the annual operating hours. Further operation of existing cremators for long hours would give rise to more frequent breakdowns and even longer down time, thereby adversely affecting the provision of cremation service to the public.
- 2.1.2 There are now 29 commonly used cremators in the territory and 6 of them are installed at the Existing Crematorium. These 6 cremators handled over 20% of the total cremations taken place in 2002. If these cremators were to cease operation eventually without any replacement or reprovisioning, it would be impossible for the other 23 cremators to absorb the current cremation loading. Replacement of the cremators at the Existing Crematorium is therefore essential for maintaining the normal level of service to the public. In addition, at a Legislative Council Case Conference held in January 2003, Members urged for early implementation of the Project for local environmental improvement.
- 2.1.3 The actual number of cremations carried out locally has increased substantially by about 55% over the past 15 years from some 18,400 in 1988 to over 28,400 in 2002. With the increase in the overall population and change in demographic profile, the demand for cremations will follow a continuously rising trend. With the use of present-day technology, the cremation time of new cremators can be shorter. As such, replacement of the Existing Crematorium by the New Crematorium will help meet part of the increasing demand for cremations.

2.1.4 In view of the above, there is a demonstrated need for this Project to upgrade the existing cremators and to meet the increasing cremation demand. Arch SD, in consultation with FEHD has considered different options in siting, crematorium layout, and cremation and pollution control technologies in order to arrive at the practicable and environmentally sound design and arrangement for the Project. Details of the key considerations leading to this Project are provided below.

2.2 Considerations on Siting of New Crematorium

2.2.1 To replace the existing cremators that have been approaching the end of their serviceable life and to ensure that future cremation demand will be met, the formerly-USD (presently FEHD) had explored various siting options as described below:

Option 1: Building additional new cremators at existing crematoria

2.2.2 The option of building additional six new cremators at existing crematoria had been considered. After reviewing the space availability of all existing crematoria, it was found that, apart from the Existing Crematorium at Diamond Hill, no other existing crematoria had space readily available for accommodating the additional six cremators. Therefore, this option was considered not feasible.

Option 2: Building a new crematorium at a new site

2.2.3 The formerly-USD conducted a site search for the development of a new crematorium for reprovisioning of the Existing Crematorium. The required site should be easily accessible by the public, and provided with the necessary infrastructure, including water and electricity supplies, drainage and sewerage system and road access. The new crematorium should also be environmentally compatible with the site and satisfy the statutory land requirement. However, as advised by the Planning Department (Plan D), most part of the urban area had been fully developed and no readily available new sites meeting these criteria could be identified. As for the New Territories, Plan D had, in a similar proposal to relocate Fu Shan Crematorium, commented that relocation should not be contemplated if upgrading (i.e. in-situ replacement) was a solution. In the absence of a suitable alternative site, this option was not feasible.

Option 3: Reprovisioning of the cremators at the Existing Crematorium site at Diamond Hill

2.2.4 Having studied the various possible options, building six new cremators to replace the six existing cremators at the Existing Crematorium at Diamond Hill site is found to be the only feasible option as well as a straight-forward and most efficient approach in providing the proposed replacement cremators for meeting the demand in cremation service. The proposal was supported by the Environmental Committee of the formerly Wong Tai Sin Provisional District Board (PDB).

The Proposed Project Site

2.2.5 After consideration of the above 3 options, it is proposed to adopt option 3, i.e., to build the New Crematorium at the Existing Crematorium site at Diamond Hill. As shown in *Figure 2.1*, the Project site is located along Po Kong Village Road in Diamond Hill, between Hammer Hill Road and Po Leung Lane. To the North of the Project site is an urn cemetery. The Diamond Hill Columbarium lies on the Eastern and Western sides of the Project site. The Northern part of the Project site is higher than the Southern part, making it sloping in nature.

2.2.6 The area of the Project site is approximately 10,300 m². The Study area focuses on the immediate environment of the Project but also takes into account the surrounding areas where necessary.

2.3 Description of the Existing and New Crematorium

Existing Crematorium

- 2.3.1 As indicated in *Figure 2.1*, most of the facilities of the Existing Crematorium are provided in the main building at Northern side of the site, which include two service halls and six cremators. According to the drawing from Arch SD, the Existing Crematorium consists of approximately 1,300 m² gross floor area (GFA). Cremators in the Existing Crematorium are fueled by diesel and there is an underground fuel tank with capacity of 9,092 L. In addition to cremation of the deceased, the Existing Crematorium processed clinical waste collected from hospitals from 1994 to 2001.

New Crematorium

- 2.3.2 The New Crematorium will comprise six cremators, four service halls and a range of supporting facilities. It will be located at a sloping site on three terraces at different levels (from 70 mPD to 80 mPD). The usable site area for accommodation of the major components of the crematorium is limited.
- 2.3.3 The New Crematorium building will be organized into 2 different zones on 3 levels, viz., the podium deck level (service halls and landscaping), arrival hall level (office public toilets etc) and the ground floor level (building services and cremator plant rooms). The podium level will be devoted to public use and the ground floor level will be mainly for operation/function/office use. The operation areas will be separated from the public area by the podium deck and access road. This 3-level terrace design will be able to fully utilize the Project Site and to avoid large scale excavation. The site area will be approximately 10,300 m² with GFA of about 2,084 m². The building height of the New Crematorium will be 18.5 m while the chimney height will be 28.5 m. *Figures 2.2 to 2.5* show the layout of the New Crematorium.
- 2.3.4 By introducing a new automatic transportation system, the New Crematorium will provide automatic handling of coffins, resulting in greater efficiency and higher-standard services. Based on a 10-hour work shift per day, the estimated number of cremations at the New Crematorium would be about 6 per day for each automatic cremation system.

2.4 Construction and Demolition Programme

- 2.4.1 The Project proposes to demolish the Existing Crematorium and to construct and operate the New Crematorium for replacement. Key construction and demolition works of the Project will be completed in two phases: Phase I (from September 2004 to February 2006) and Phase II (from October 2006 to November 2007). The proposed work programme is as provided in *Figure 2.6*. The identified sensitive uses surrounding the Project site are illustrated in *Figure 2.7*. Details of the 2 phases of work are as follows:

Phase I

- (a) Demolition of facilities in Existing Crematorium in southern side of the Project site, including the existing sitting out area, garden of remembrance, CLP secondary substation, toilets, pavilion and retaining walls
- (b) Construction of the New Crematorium main facilities, which include one cremator plant room housing six cremators, three fuel tanks (with total capacity of 34,000 L), two service halls (each can hold 120 people), one pulverizing room, one mortuary, one office, toilets for public, ancillary service rooms including battery fork lift, transformer and switch room, emergency generator room and joss burners, two (2) automatic transportation systems for coffins and part of an underground service tunnel for coffin circulation, vehicular loading bay for coffin van, coach, landscape area and dangerous goods store and temporary CLP electricity transformer at Phase II area

Phase II

- (a) Demolition of Existing Crematorium main facilities, which include two service halls, one cremation room with six cremators, one transformer room, one underground oil fuel storage tank (9,092 L), one mortuary, one machine room, one general store plus water tank, one dangerous goods store and one chimney (10 m in height)
- (b) Construction of the remaining facilities of the New Crematorium, which include two service halls (each can hold 120 people), two (2) automatic transportation systems for coffins and the remaining part of the underground service tunnel for coffin circulation, vehicular loading bay for coffin van, coach etc., and landscape area

2.4.2 The columbarium next to the Project site will remain untouched throughout both Phase I and Phase II.

2.4.3 To provide cremation service in a continuous manner, operation of the Existing Crematorium will be maintained until the commissioning of the New Crematorium main facilities provided in Phase I of the Project. However, to prevent deterioration of environmental performance, in particular air quality, mitigation measures are recommended to minimize any cumulative impact.

2.5 Benefits of this Project

2.5.1 After due consideration of the siting, layout, design, construction and demolition schedule as discussed in the previous sections, the proposed Project will have the following key environmental and social benefits:

- The Project will be able to address the increasing cremation demand without construction of additional cremators, which will otherwise incur extra pollution loading
- Replacing the Existing Crematorium by the New Crematorium with improved cremation design and air pollution control technologies will lead to the betterment of local air quality
- The existing cremators are consuming about 547,000 L of diesel per year. The new cremators would be more fuel efficient and therefore utilize less natural resources
- Spatial utilization in the Project site will be improved
- The Project will be able to address the increasing cremation demand in a relatively shorter timeframe by avoiding the long lead time required to get a piece of vacant and earmarked land for adding a new crematorium in the relevant statutory plan
- Building the New Crematorium at the same location of the Existing Crematorium will provide a speedy means to replace the existing cremators, which are at the end of their serviceable life, because less time will be needed for making the infrastructure provisions
- Replacement of the existing cremators by the new cremators would more likely be accepted by the community as evidenced by the support of the Environmental Committee of the formerly Wong Tai Sin PDB in 1997

2.6 Scenarios with and without the Project

2.6.1 There is a demonstrated need for the Project to replace the Existing Crematorium, which is near the end of its serviceable life, by the New Crematorium that will be equipped with state-of-the-art cremation technology and pollution control facilities. With the Project, it will be able to achieve improved environmental quality (particularly the air quality) in the locality as well as to address the increasing cremation demand without the need of building extra cremators.

2.6.2 Without the Project, on the other hand, the existing cremators that are near the end of their serviceable life will have to continue their operation, which might give rise to the following adverse situations:

- The local environmental conditions, particularly the air quality, at the Existing Crematorium might be worsened due to potential reduction in performance of the existing cremators.

- According to the information from FEHD, the total number of odour and black smoke complaints relating to the operation of the Existing Crematorium had risen from 8 in 2000 to 10 in 2002. Continuing the use of existing cremators with likely increasing faults might see a further increase the number of these complaints in future.
- The likely increasing down-time of the existing cremators might adversely affect the normal provision of cremation service to the public.

3 SUMMARY OF POTENTIAL IMPACTS AND RECOMMENDATIONS

3.1 Overall Assessment Methodology

3.1.1 This EIA had been carried out based on the information provided by Arch SD and FEHD. Where possible, the Consultants had provided input on modification on New Crematorium design, air pollution control system adopted, construction programme and methodology etc. so to prevent generation of environmental impacts. Degree of environmental impacts generated throughout the Project had been evaluated and where applicable, mitigation measures had been recommended to maintain the impact to acceptable level.

3.2 Air Quality Impact

3.2.1 The major air quality impact of the new Crematorium will be fugitive dust emission during the construction phases and chimney emissions from the cremators during the operation phase. An air quality impact assessment was carried out to assess the air quality impact during the construction and operational phases of the Crematorium.

3.2.2 The air quality impact due to fugitive dust emission during construction phases of the Crematorium was predicted by Industrial Sources Complex (Short Term) 3 (ISCST 3). It was found that when appropriate dust suppression measures, such as water spraying, are implemented, the total suspended particulates (TSP) emission will be reduced by 90%. In addition, the dust control requirements of the Air Pollution Control (Construction Dust) Regulation shall be followed for the dust control. The levels of 1-hour and 24-hour average TSP at all the 24 identified air sensitive receivers (ASR), with appropriate fugitive dust control measures, will meet the respective air quality guidelines during construction Phases I & II. It is therefore anticipated that the air quality during the construction phases will not be adversely affected.

3.2.3 The detail design of the New Cremators is subjected to tendering process and therefore the cremation design and air pollution control technology to be adopted is not confirmed at this stage. The cremation designs most widely available are flat-bed type and free-falling type because of their high combustion efficiency. Whereas wet scrubbing, carbon injection, neutralization with chemical, electrostatic precipitation, bag filters, quenching are applicable air pollution control technology. The newly built Kwai Chung Crematorium adopted free-falling cremation design and installed cyclone and bag filter using dry chemical process and could be referenced in the selection of appropriate cremation design and air pollution control technology to be adopted in the New Crematorium.

3.2.4 When the new Crematorium is put into operation, the chimney emissions from the cremators will be the major air quality impact to the nearby ASRs. The operation of the cremators will generate and emit a variety of air pollutants, including particulate matters, gaseous air pollutants such as sulphur dioxide, nitrogen dioxide, carbon monoxide, total organic compounds, heavy metals and dioxins.

3.2.5 During the testing and commissioning stage, administrative measures will be implemented to ensure that a total of no more than 6 cremators, including both existing and new cremators will be in operation at the same time, in order to avoid imposing additional air pollutant emissions to the environment.

- 3.2.6 An air quality impact assessment was carried out by air quality modelling technique, the short term and long term ambient air quality due to the operation of the Crematorium was predicted. It was found that the levels of all the air pollutants including dioxins under assessment meet the respective acceptable air quality criteria. In addition, the lifetime excess cancer risk imposed on the general public due to dioxins emission will not be significant. Nevertheless, under the Air Pollution Control Ordinance, FEHD is required to obtain a specified process licence from EPD for the operation of the new cremators in the New Crematorium such that the new cremators will fully comply with the Best Practicable Means (BPM) 12/2 requirements under the APCO and the target emission limits of non-BPM regulated pollutants to control the emissions.
- 3.2.7 As a number of complaints about the odour nuisance relating to the operation of the existing crematorium were received, an odour assessment was also carried out to evaluate the odour nuisance to the nearby ASRs. Since the New Crematorium will be provided with advanced cremators equipped with appropriate air pollution control system, the emissions of air pollutants and odour will be much reduced. Therefore, the assessment results show that the odour impact to the nearby ASRs will not be significant.

3.3 Noise Impact

- 3.3.1 Potential noise impacts to the nearby sensitive receivers during the C&D works will be mainly contributed by the operation of the powered mechanical equipment as well as the associated site activities. As recommended in the EIA report, the C&D noise impact can be reduced and brought down to a state of compliance by implementation of necessary noise mitigation measures, including use of quiet equipment, use of movable noise barriers and implementation of good site practices throughout the C&D works. The contractor should minimize construction noise exposure to schools (SR1 to SR5) as far as practicable, especially during examination periods. In addition, the contractor should liaise with the schools and the Hong Kong Examinations and Assessment Authority to ascertain the dates and times of examination periods during the course of the construction/ demolition works.
- 3.3.2 During the operation stage of the New Crematorium, its air-conditioning system, radiators for cremators, general exhaust fans and exhaust fans for air pollution control system will be the major potential fixed-noise sources to the nearby premises. Considering that these systems are not expected to be operated during nighttime, the noise contributed from the plant operation towards the representative noise sensitive receivers for the daytime period was estimated and the predicted noise levels are all within the daytime operation noise criteria. No adverse residual noise impacts are hence expected.

3.4 Land Contamination

- 3.4.1 On the basis of historical information and current practices, principal sources of contaminant sources were identified. These sources include fuel storage tank, dangerous goods store, CLP secondary substation, areas impacted by aerial deposition from Existing Crematorium stack emissions and cremators, as well as the former crematorium.
- 3.4.2 A Contamination Assessment Plan (CAP) detailing the potential contamination sources, pathways and receptors as well as the site investigation proposals has been prepared and endorsed by EPD. The CAP has identified six locations where potential contaminants (diesel-range total petroleum hydrocarbon, polyaromatic hydrocarbons, polychlorinated biphenyls, the "Dutch List" of heavy metals and/or dioxins) may be present. Subsequent to the site investigation, a Contamination Assessment Report revealed that no contamination was found apart from locations S3 and S5 (see *Figure 3.1*) where exceedance in lead and tin were present. Toxicity Characteristic Leaching Procedure (TCLP) tests conducted confirmed that the heavy metals contaminated soil from these two locations would be disposed to landfill without prior treatment. Detail remediation procedures have been given in the Remediation Action Plan (RAP).

- 3.4.3 It is recommended to conduct supplementary site investigation at the CLP secondary substation, after decommissioning but prior to demolition of the substation, during Phase I of the works, as it cannot be accessed at this stage. In addition, since the Existing Crematorium will be in operation until 2006, collection of confirmatory surface samples at locations S1 to S6 during the Phase II has been recommended to determine any further contamination due to aerial deposition. In addition, if visual or olfactory evidence of fuel contamination by experienced environmental specialist underneath the underground fuel tank during Phase II, confirmatory site investigation on diesel range total petroleum hydrocarbon should be carried out.
- 3.4.4 Provided that the New Crematorium complies with the prescribed air emission limits as specified in the BPM 12/2 and target emission limits set by the proponent, it is considered very unlikely that the aerial deposition would give rise to significant land contamination. In addition, provided that the fuel tanks are constructed, maintained and inspected in accordance with appropriate standards and regulations, the likelihood of uncontrolled leakage of fuel causing land contamination is low.

3.5 Waste Management

- 3.5.1 The key waste materials to be generated during the C&D work of the Project will comprise excavated materials, C&D materials, contaminated materials (including asbestos containing materials (ACM), dioxin containing materials (DCM), heavy metal containing materials (HMCM), polyaromatic hydrocarbons containing materials (PAHCM), total petroleum hydrocarbon containing materials (TPHCM) and polychlorinated biphenyls containing materials (PCBCM)), chemical waste (such as spent lubricants, solvents, etc.) and general refuse. Ash and non-combustible residues, chemical waste and general refuse are expected to be the major types of waste arising from the operation of the New Crematorium.
- 3.5.2 Appropriate waste reduction, reuse and/or recycling measures are recommended in the EIA Report and should be adopted as far as practicable in order to minimize the amount of waste requiring disposal. Approximately 2,100 m³ of surplus excavated material will be generated from the C&D works and should be used for landscaping works as far as practicable. The C&D materials should be segregated into inert and non-inert portions (with estimated quantities of about 272 m³ and 68 m³ respectively) so that the inert waste can be reused on site or used as public fill materials. Where feasible, waste with recyclable values (e.g., timber, paper, aluminium cans, plastic bottles) should be separated for collection by outside waste recycling agents.
- 3.5.3 Proper waste management measures as detailed in the EIA Report should be applied to control the secondary environmental impacts arising from handling, storage and disposal of the waste materials (such as potential hazard, air and odour emissions, transportation and wastewater discharges) to acceptable levels. Particular attention has been drawn to the ACM, DCM, HMCM and PAHCM from certain contaminated ash waste and building structures. Areas where ACM, DCM, HMCM and PAHCM might be found (cremators, chimney and flue) cannot be accessed now due to operation constraints. Therefore, supplementary site investigation is recommended to be conducted during Phase II, after the Existing Crematorium is decommissioned but before the demolition work.
- 3.5.4 Registered asbestos contractor should be employed for demolition of building structures having ACM and for proper handling and disposal of the contaminated materials in accordance with the relevant code of practices (COP) published by EPD. Relevant mitigation measure for DCM and HMCM, depending on the contamination level to be found in further site investigation, have also been recommended.
- 3.5.5 Subject to supplementary and confirmatory land contamination site investigation results, where DCM, HMCM, PAHCM, TPHCM and PCBCM in soil might be found, the environmental impact associated with the handling of soil remediation is expected to be small.

- 3.5.6 With effective implementation of the recommended measures, it is anticipated that the potential impacts on the capacity of waste collection, transfer and disposal facilities as well as the secondary environmental impacts from management of the various waste materials will not be significant for the Project.

3.6 Landscape and Visual Impact

- 3.6.1 The Project will result in a net loss of soft landscaped area of approximately 970 m² (the area of planting in Existing Crematorium is 2,620 m² while the areas of planting, lily pond and lawn in New Crematorium are 1,650 m², 751 m² and 507 m² respectively). This will also include removal of 144 trees and 12 mature shrubs by either transplanting (132 nos) or felling (24 nos). It is proposed to minimize the anticipated landscape impacts by transplanting the most suitable specimens, including the protected species (9 mature/semi-matures trees and 12 immature trees/shrubs), to locations within the Existing Crematorium. If not all the trees can be accommodated within existing planting areas then it is proposed to store them in available space in FEHD's Wo Hop Shek Crematorium pending availability of other suitable sites in other projects. This will apply mainly to the trees affected by Phase I C&D work. Careful co-ordination of the two Phases of C&D work will allow transplants from the Phase II site to be transplanted directly into the completed Phase I site. The proposed transplanting coupled with the proposed new planting to the crematorium perimeter and open space areas will help mitigate the overall landscape impacts. A Master Landscape Plan is provided in *Figure 3.2*. As a result, residual landscape impacts will be acceptable with proposed mitigation measures.
- 3.6.2 A number of mitigation measures including tree transplanting, tree protection, topsoil conservation, replanting and design of New Crematorium architecture were recommended. With regard to visual impact, retention of the Existing Crematorium's dense and mature boundary tree belt will provide a strategic screen to low-level visually sensitive receivers (VSRs). Furthermore, the building is generally low to medium rise and nestles neatly into the existing topography and surrounding amenity planting, thus reducing the overall visual impacts for high-level VSRs. The overall residual visual impacts will be acceptable with the proposed mitigation measures.

3.7 Water Quality Impact

- 3.7.1 The major potential sources of impacts on nearby water quality from C&D work of the Project would be from C&D run-off and drainage, general C&D activities, sewage generated from site staff and soil remediation work. As recommended in the EIA Report, the contractor will be required to implement appropriate mitigation measures with reference to the relevant Practice Note published by EPD in order to prevent and control the potential water quality impacts. With regard to the possible water pollution arising from soil remediation work, relevant mitigation measures were recommended in the RAP. Nevertheless, according to the site investigation work conducted in March 2003, the amount of ground water at the Project site would be limited. The water quality impact associated with soil remediation is expected to be small.
- 3.7.2 During operation of the New Crematorium, since the air pollution control system would involve a dry process, the only key sources of potential water pollution will be sewage from visitors/staff and wastewater from general cleaning activities (with an estimated total quantity of about 28 m³ /day). All such sewage/wastewater will be properly connected to foul sewer that leads to the government Sewage Treatment Work for treatment.
- 3.7.3 No significant residual impacts on the water quality are anticipated when the mitigation measures as recommended in the EIA Report are properly implemented.

3.8 Hazard to Life

- 3.8.1 As there will be 3 diesel storage tanks and a dangerous goods store where chemicals (such as activated carbon and lime) will be stored, there might be potential hazard (e.g. land contamination from diesel leakage, fire hazard due to undetected build-up of diesel in a confined space, etc.) during operation of the New Crematorium. To mitigate the hazard level to minimal, it is recommended in the EIA Report that the fuel tanks should be designed with adequate safety features. Moreover, appropriate safety and precautionary measures on proper handling and storage, spill prevention and clean up should be adopted throughout the operation phase of the Project and be included in the environmental management plan framework.

3.9 Environmental Monitoring and Audit

- 3.9.1 Environmental monitoring and audit (EM&A) is recommended for air quality, noise level, land contamination, waste management and visual impact and landscape. Details of the EM&A programme, including the monitoring locations, frequencies and procedures, are documented in a stand-alone EM&A Manual for the Project. This will enable the contractor to receive early warning and to take necessary actions to reduce impacts at specific areas in case the environmental criteria are approached. The effectiveness of the recommended mitigation measures could also be assessed through this monitoring and auditing exercise.
- 3.9.2 All the parameters to be monitored and audited during the Phase I and II C&D works and the operation phase of the Project are as summarized in Table 3.1.

Table 3.1 Summary for All Monitoring Parameters

Monitoring Area	Construction and Demolition Phases I & II	Operation Phase
Air Quality	Monitoring of 24-hour and 1-hour TSP every 6 days at 2 selected sampling locations at nearby ASRs	<p><u>Continuous monitoring</u></p> <ul style="list-style-type: none"> - Temperature of primary chamber - Temperature of secondary chamber - Smoke density - Carbon monoxide and oxygen <p><u>Commissioning stage & routine compliance checking</u></p> <ul style="list-style-type: none"> - Particulate matters - Hydrogen chloride - Carbon monoxide - Organic compounds - Mercury - Dioxins - Smoke density
Noise	Weekly monitoring of noise level at 3 selected sampling locations at the sensitive receiver	Not required
Land Contamination	<p><u>Supplementary site investigation</u> Soil: At the CLP secondary substation during Phase I (diesel range total petroleum hydrocarbon and polychlorinated biphenyls)</p> <p><u>Confirmatory site investigation</u> Soil: Locations S1 to S6 during Phase II (dioxin, heavy metals, polyaromatic hydrocarbon)</p> <p>Soil: Underneath underground fuel tank during Phase II (if visual or olfactory evidence of fuel contamination by experienced environmental specialist) (diesel range total petroleum hydrocarbon)</p> <p><u>Remedial work</u> Soil: Around locations S3 and S5 during Phase II (tin and lead)</p>	Not required
Waste Management	<p><u>Supplementary site investigation</u> Ash: at cremators/chimney/flues during Phase II (dioxin, heavy metals, polyaromatic hydrocarbon)</p> <p>Building Structures: cremators/chimney/flues during Phase II (asbestos)</p>	Not required
Landscape & Visual Impact	Weekly inspections of tree protection measures as well as monitoring of tree transplant operations during both phases	The 1 st , 6 th and 12 th months inspection of maintenance after the completion of all the recommended planting work

4 CONCLUSIONS

- 4.1.1 The EIA findings have provided information on the nature and extent of the environmental impacts arising from the Project. Where appropriate, the EIA has recommended mitigation measures to reduce the impacts to ensure compliance with the relevant environmental legislation and standards.
- 4.1.2 Overall speaking, the EIA has predicted that the environmental impacts arising from the Project are either considered minimal or can be mitigated to an extent where the impacts on the sensitive receivers are acceptable. The EM&A programme is therefore recommended to ensure that the mitigation measures are properly implemented and environmental quality is not seriously affected throughout Phase I and Phase II C&D works as well as the operation phase of the Project.