

1. PURPOSE OF PROJECT PROFILE

- 1.1 This project profile sets out the proposed scope of the environmental issues associated with a proposed animal cremator project at an identified site in Nim Wan, Tuen Mun for the application of an environmental impact assessment (EIA) study brief.

2. BASIC INFORMATION

2.1 Project Title

Project title : Animal Cremator

2.2 Purpose and Nature of the Project

It is proposed to build an animal cremator at a site in Nim Wan, Tuen Mun for the disposal of animal carcasses¹. Animal carcasses will mainly be delivered by the Agricultural & Fisheries Department, Regional Services Department, Urban Services Department, slaughterhouses and other private sources. The Animal Cremator will also provide individual cremation service of dead pets for the public (optional). During emergency situation, it may be used to handle human body parts such as amputated limbs and excised organs originated from hospitals or clinics.

2.3 Name of Project Proponent

Waste Facilities Business Unit (WFBU) of the Environmental Protection Department (EPD).

2.4 Location of Project

The Animal Cremator is located immediately to the south of the CLP Power Hong Kong Limited's pulverized fly ash (PFA) lagoon and in the vicinity of the West New Territories (WENT) Landfill (refer to the attached drawings in Appendix A and B), and will occupy an area of about 0.3 - 0.4 ha. The Animal Cremator is a designated project.

2.5 Name and Telephone Number of Contact Persons

Mr. Simon S. M. Liu Tel. : 2872 1682 Fax : 2591 0636

Mr. Eric Y. K. Cheung Tel. : 2872 1620 Fax : 2591 0636

3. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

3.1 Scope of Works

- 3.1.1 The EIA study will be carried out by a consultant to be employed by the WFBU. The Animal Cremator will be built under a Design-Build-Operate (DBO) Contract. The

¹ "Animal carcasses" to be disposed of by means of cremation include animal dead bodies (intact, or parts); offal; condemned meat (which is not suitable for human consumption).

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Contractor will be responsible for the design, build and operation of the Animal Cremator which will receive animal carcasses from different public and private sources.

3.1.2 The construction of the Animal Cremator will basically comprise the following :

- (1) construction of a building for accommodating cremator units and the associated facilities, workshops, office, cold storage, etc. to handle 20 tonnes (including contingency) of animal carcasses per day ;
- (2) construction of a chimney (of about 20 m to 30 m high) ;
- (3) installation of probably two cremator units and one pet cremator (optional) ;
- (4) provision of infrastructures including service roads and drains, sewerage, paved parking spaces and fencings ; and
- (5) where necessary, provision of wastewater treatment facilities or pumping facility to transfer its wastewater to other government facilities for treatment.

3.1.3 The operation of the Animal Cremator comprises the following activities :

(1) Waste Collection and Transportation

Animal carcasses will be delivered by Government and private vehicles. At present, the total daily arisings of animal carcasses is about 14.5 tonnes per day. The projected daily arisings of animal carcasses is about 20 tonnes per day by the year 2021.

(2) Waste Reception and Feeding

Deliveries of animal carcasses will generally occur during daytime working hours (08:30 - 18:00). Animal carcasses will be kept temporarily in a refrigerated storage unit pending for cremation. The storage capacity will be sufficient for 2-days' waste throughput.

(3) Cremation

The two cremators, batch type units, will have a total average cremation capacity of about 1.5 tonnes per hour. The cremators will also handle specific types of human body parts such as amputated limbs and excised organs generated from hospitals or clinics as a backup option under emergency situation. The pet cremator (optional) will provide individual pet cremation service for the public (to be confirmed later).

(4) Waste Disposal

Residues and other solid waste will be disposed of at the WENT Landfill. Liquid waste generated by the plant will be disposed of to sewer or nearby government facility. Pre-treatment of wastewater may be necessary

(5) Emission Monitoring

Pollutant and system monitoring will be provided to ensure that the plant performs to the necessary standards during operation. The flue gas emission will meet the appropriate Best Practical Means Requirements under the *Air Pollution Control Ordinance* (APCO).

3.2 Project Programme

The project programme is scheduled as follows :

Feasibility Study including EIA	05/2000 - 10/2001
Public Consultation	04/2001 - 08/2001
Funding Application	06/2001 - 02/2002
Tendering	03/2002 - 12/2002
Commencement of Construction	01/2003 - 05/2004
Commissioning and Operation	06/2004

4. POSSIBLE IMPACTS ON THE ENVIRONMENT

4.1 The Animal Cremator has the potential to cause environmental impacts on its surrounding area. Possible impacts on its surrounding areas during both the construction and operation stages of the Animal Cremator include the following aspects :

- air quality
- health
- noise
- traffic generation
- water quality
- visual appearance
- waste management
- ecology
- hazard to life

The following environmental impacts are *not* expected to arise during the construction and operation stages of the Animal Cremator and, therefore, not applicable :

- disruption of water movement or bottom sediment

4.2 Air Quality

4.2.1 Construction Phase

Dust and exhaust emissions will be emitted from on-site construction activities and construction traffic and will vary substantially from day to day depending on the extent of construction activities and the prevailing weather conditions. Dust will be emitted from construction activities such as site excavation, handling and storage of construction materials, spoil or aggregates and vehicle movements.

Due to the limited scale of construction work, the construction vehicle trip is estimated to be about 40 per day during the peak construction period. The nearest Air Receivers (ARs) are about 2.0 km from the proposed site for the Animal Cremator (see the attached location map).

4.2.2 *Operational Phase*

Operations of the Animal Cremator will involve reception, handling, storage, cremation and removal of ash, all of which may give rise to air quality impacts. The possible air quality impacts during the operation of the Animal Cremator include :

- fugitive emissions of dust from handling and storage of reagents and ash on-site ;
- cremator stack emissions ; and
- odours from fugitive sources.

(1) *Operational Fugitive Dust Emissions*

Operations at the Animal Cremator will involve handling, storage and removal of materials, all of which could give rise to fugitive dust emissions.

These materials will consist of :

- scrubber and wastewater treatment (if required) reagents ;
- bottom ash from the cremator ;
- ash and reagents from gas cleaning ; and
- dewatered sludge from the wastewater treatment facility, if any.

(2) *Cremator Stack Emission*

The Contractor shall design, construct and operate cremators which shall, as a minimum requirement, comply with the emission standards under *Air Pollution Control Ordinance (APCO)*. The cremators shall be designed to comply with the *Air Pollution Control (Specified Process) Regulations*.

(3) *Odours from Fugitive Sources*

The handling of animal carcasses can generate fugitive odour emissions for which adequate controls shall be applied.

(4) *Airport Height Restriction*

The site is at about 12 km north of the Hong Kong International Airport and is subject to an airport height restriction of about 190 mPD. It is anticipated that the emission stack of the Animal Cremator, the tallest structure within the site, is about 20 m to 30 m high (<50 mPD).

(5) *Cumulative Impact of Aerial Emissions*

The cumulative impact of aerial emissions shall be assessed taking into consideration of the nearby Black Point Power Station. If the co-location option is adopted for any other proposed incineration facilities at or in the vicinity of the site, the overall cumulative impact of aerial emissions to the surrounding area shall also be assessed.

4.3 Health

Potential health risks associated with aerial emissions from the Animal Cremator will be similar to that of the Centralized Incineration Facility (CIF) which has been assessed under the CIF EIA study (see reference in *Section 7* of the Project Profile). The CIF EIA shows that the level of risk to health caused by the CIF (including incinerators for clinical waste and animal carcasses) is within the established limits. However, infectious animal carcasses and human body parts will also be handled by the Animal Cremator under emergency situation, the long term health effect of the atmospheric emissions from the Animal Cremator shall be assessed.

4.4 Noise

4.4.1 Construction Phase

(1) On-Site Noise

It is confirmed in the Sludge Treatment and Disposal Strategy Study: *Site Specific Feasibility of Sludge Management Strategy (SMS) and Sludge Disposal Plan (SDP) - Volume 1 (Main Report)* that there are no existing or planned Noise Sensitive Receivers (NSRs) located within 300 m of the proposed site. However, a temple is found in the vicinity (about 320 m away).

The construction activities of the proposed Animal Cremator shall be planned and controlled in accordance with the *Noise Control Ordinance*. If the Contractor proposes to carry out construction activities requiring the use of powered mechanical equipment during the restricted hours (i.e. outside of 0700-1900 hours Monday through Saturday and during public holidays) and particularly at night, the Contractor shall be required to obtain a Construction Noise Permit (CNP) and shall need to achieve the applicable Acceptable Noise Level (ANL) with the necessary mitigation measures.

(2) Traffic Noise

The construction traffic is estimated to be about 40 vehicle trips per day during the peak construction period.

4.4.2 Operational Phase

(1) On-Site Noise

All the machinery and the cremator units shall be installed in an enclosed building structure.

(2) Traffic Noise

The operational traffic is estimated to be about 20 vehicle trips per day to the cremator site.

4.5 Traffic Generation

4.5.1 Construction Phase

The traffic generated by the cremator construction work is estimated to be about 40 vehicle trips per day during the peak construction period.

4.5.2 Operational Phase

The traffic generated by the cremator operation is estimated to be about 20 vehicle trips per day to the cremator site.

4.6 Water Quality

4.6.1 Construction Phase

The major sources of water quality impacts that can potentially arise from the construction of the facility will include construction run-off and surface water drainage, and sewage from on-site construction workforce.

4.6.2 Operational Phase

During operation of the facility, discharges arising will include washwater from delivery trucks and vehicle washing, hose-down water and drainage from process areas, stormwater run-off and domestic sewage.

Disinfection of the cremator facilities and appurtenances may be needed on a regular basis and will be required after cremation of infectious animal carcasses.

4.7 Visual Appearance

4.7.1 Construction Phase

The construction work for the Animal Cremator is expected to have low visual impact on the distant sensitive receptors.

4.7.2 Operational Phase

There is the potential for steam to be emitted from the stack of an incineration facility.

4.8 Waste Management

4.8.1 Construction Phase

It is expected that the site preparation work and earthwork activities will not be extensive. Therefore, the construction of the Animal Cremator will generate small volumes of excavated material and small quantities of general construction wastes, chemical wastes and general refuse.

4.8.2 *Operational Phase*

During the operation of the Animal Cremator, waste categories likely to be generated include chemical wastes, general refuse, and post-combustion wastes.

4.9 **Ecology**

4.9.1 *Ecological Importance of the Site*

The site comprises a driveway, footpaths, and open levelled grounds, presently covering with grass and some trees. The natural vegetation offsite on the low-lying slope inland is largely common shrubs or trees intermingled with grassland. This type of vegetation does not support very rich and diversified animal life. The Castle Peak Firing Range to the further south, though relatively less disturbed, has abundant rock outcrops with poor grass patches.

The subject site is located in the Deep Bay Catchment area. The potential impact on these ecological resources shall be evaluated.

4.9.2 *Construction Phase*

In general, construction activities for typical development can have the following impacts to the vegetation and wildlife of the area :

- direct losses may occur as a result of access, clearing, excavation, and other civil engineering works ; and
- indirect effects from dust and exhaust emissions and sediment runoff.

It is envisaged that no extensive site formation works (the principal source of construction dust) are needed and the dust generated during construction will be for short duration.

4.9.3 *Operational Phase*

Regarding the operational phase, the stack emissions from the Animal Cremator would have the potential to effect on the local ecosystem. The likely pollutants of principal concern are SO₂, NO_x, CO, and dust.

Stack emissions from the Animal Cremator could affect the upland vegetation in the Castle Peak Firing Range.

4.10 **Hazard to Life**

4.10.1 *Construction Phase*

Small amounts of chemicals will be used by the contractor for the construction activities. The Contractor shall be cautioned for the proper use, handling and disposal of the chemicals or any other hazardous materials.

4.10.2 *Operational Phase*

The cremator operation will involve transportation, handling, storage and use of fuel oil. The risk of accidents which would result in pollution and hazard to life shall be evaluated.

5. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

5.1 Existing and planned sensitive receivers and sensitive parts of the natural environment which might be affected by the proposed project are as follows :

(1) *Temple*

A small temple is situated to the west of the site. The access to this temple is via footpath running along the eastern and southern boundaries of the site.

(2) *Site of Cultural Heritage*

The site has not been subjected to any archaeological investigation nor any survey of historic buildings and structures. Before the start of any foundation related construction works, an archaeological investigation and survey of historic buildings and structures may need to be conducted to confirm if the site is of any archeological interest.

(3) *Water Course*

The site is about 200 m away from the downstream of a small nullah. The effluent arising from the Animal Cremator during both construction phase and operational phase would need to be properly controlled and treated before discharging to the nullah nearby.

5.2 There is no major element of the surrounding environment and existing and/or relevant past land use(s) on site, which might affect the area in which the project is proposed to be located.

6. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

6.1 Air Quality

6.1.1 *Construction Phase*

The construction works shall be carried out with good on-site management and working practices, and appropriate dust suppression measures such as frequent water spraying.

6.1.2 *Operational Phase*

(1) *Operational Fugitive Dust Emissions*

Fugitive dust emissions shall be controlled through proper enclosure design of the facility, for instance, by enclosing dusty operations and filtering exhaust air.

To minimize fugitive dust impacts during the operation of the Animal Cremator, good housekeeping measures shall be adopted and staff shall be trained to an appropriate level.

(2) *Cremator Stack Emission*

The Animal Cremator shall be designed and operated to minimize any air pollution. Regular flue gas sampling and monitoring shall be carried out to ensure that the emission standards under APCO are fully met. Also, the ambient air quality at the identified ARs shall be monitored against the Hong Kong Air Quality Objectives (AQOs).

(3) *Odours from Fugitive Sources*

All animal carcasses shall be handled within the main cremator building where deodourizing measures would be applied to prevent fugitive emissions.

6.2 Water Quality

6.2.1 Construction Phase

Proper site management is essential to minimize wash-off during the rainy season and "good housekeeping" practice to ensure that debris and rubbish cannot gain access to nearby stormwater systems. Construction site discharges into the North Western Water Control Zone (WCZ) are controlled under the *Water Pollution Control Ordinance* (WPCO) and thus valid WPCO licences are required. Standard measures which would be appropriate in this case are described below. The Contractor shall also be referred to the *Practice Notes for Professional Persons - Construction Site Drainage, EPD, 1994* (ProPECC PN 1/94) and noted that only stormwater may be discharged to stormwater drains.

6.2.2 Operational Phase

Wastewater sources from the operation of the Animal Cremator basically include washing of delivery trucks, process area hose-down and maintenance cleanup which all together will contain contaminants. These wastewater will be treated by an on-site wastewater treatment facility, if required, before discharge.

The operation of the Animal Cremator is not envisaged to generate any wastewater discharge likely to cause adverse water quality impacts as the wastewater will be treated to the requirements of the TM under WPCO before discharge. The Contractor shall confirm that effluent streams from the site to be treated.

6.3 Visual Appearance

6.3.1 Exterior Design of the Facility

The architectural design of the facility will be compatible with the current and planned landuses in the area. A commonality in the architectural design shall be adopted for all building structures. Common colour themes shall run throughout the site, from the stack and roofs to equipment, and where possible, the site shall be enlivened through the use of attractive bold colour themes, strong signage and the detailing of specific features of buildings (e.g. stairways, access points, etc.).

6.3.2 *Operational Impacts*

The emissions from the stack of the Animal Cremator shall be controlled to ensure no visible plume is produced and a steam free emission under normal conditions.

6.4 **Waste Management**

The Contractor shall provide training and instruction to his staff to increase awareness and draw attention to waste management issues and the need to minimize waste generation.

6.4.1 *Construction Phase*

(1) *Waste Minimization*

Construction materials (and materials generated during operation) shall be recycled or reused wherever possible. The waste management strategy to be employed shall be waste minimization at source. Where waste generation is unavoidable, the potential for recycling or reuse shall be explored and opportunities taken wherever possible. If wastes cannot be recycled, then the proposed disposal routes as mitigation measures shall be followed.

Waste reduction measures shall be introduced at the design stage and carried through the construction activities, wherever possible, by careful purchasing control, reuse of formwork and good site management.

(2) *Segregation of Wastes*

Activities during the construction of the Animal Cremator will result in the generation of a variety of wastes which can be divided into distinct categories based on their nature and ultimate disposal sites.

In order to ensure that all wastes are disposed of in an appropriate manner, waste shall be separated by category on-site by the Contractor. The criteria for sorting solid waste are described in *New Disposal Arrangements for Construction Waste* issued by the EPD and the CED.

(3) *Excavated Material*

It is expected that the Animal Cremator construction will not generate significant quantities of excavated material during the initial earthwork activities and digging of foundations. Excavated material from the site will comprise primarily rock and sand which can be used as reclamation fill. The main impacts associated with the excavated material are related to air quality and dust generation during excavation, stockpiling and transportation which have been discussed in *Section 4.2.1* of the Project Profile.

(4) *Construction Wastes*

In accordance with the *New Disposal Arrangements for Construction Waste*, issued by EPD and CED, disposal of construction waste can either be at a specified landfill, or at a public dump. Depending on the nature of the construction wastes generated, surplus construction waste not suitable for reuse on-site shall be collected by a waste collector under arrangement with the Contractor and deposited at a designated landfill or public dump. The

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Contractor shall ensure that the necessary waste disposal permits are obtained prior to the collection of waste.

The Contractor shall recycle as far and as much as possible of the construction waste on-site, in order to reduce the requirement to import additional materials.

(5) *Chemical Wastes*

Chemical wastes will arise principally as a result of maintenance activities. It is difficult to quantify the amount of chemical waste which will arise from the construction and operation activities since it will be highly dependent on the Contractor's on-site maintenance requirements and the number of plant and vehicles utilized.

Chemical wastes shall be disposed of at the Chemical Waste Treatment Centre (CWTC) located at Tsing Yi to ensure that environmental, health and safety risks are reduced to the minimum, provided that correct storage procedures are instigated on-site and that the collection vehicles are operated by licensed collectors.

(6) *General Refuse*

The amount of general refuse which is likely to arise cannot be quantified at this time as it will be largely dependent on workforce size and site practices.

General refuse generated on-site shall be stored and collected separately from other construction, industrial and chemical wastes. The Contractor may arrange for the collection and disposal of the refuse to the landfill. The removal of waste from the site shall be arranged on a daily basis by the Contractor to minimize any potential odour impacts, the presence of pests, vermin and other scavengers and prevent unsightly accumulation of waste.

6.4.2 *Operational Phase*

During the operation of the Animal Cremator, the main sources of impacts associated with post-combustion are the possible effects of the quantities generated on disposal capacity and the proposed arrangements for handling and disposal of these wastes.

(1) *Waste Minimization*

Recycling of wastes generated through administrative and maintenance activities during the operation shall be encouraged as long as it does not interfere with the operation of the Animal Cremator. No recycling of the bottom ash shall be permitted. The Contractor shall recycle, where practical, waste paper generated at the Contractor's administrative offices, scrap metal and other recyclable materials.

(2) *General Refuse and Chemical Wastes*

Waste management measures similar to those for the construction phase will be applied.

(3) Disposal of Post Combustion Wastes

In general, bottom ash from the Animal Cremator will contain mainly carboniferous material and trace metals. Filter cake will be mainly fly ash from gas streams and will usually have high levels of trace metals from dewatered hydroxides, sulphates and sulphites of metals.

Ash from the Animal Cremator will be disposed of at the WENT Landfill. The quantities of bottom ash and filter cake that will be produced by the Animal Cremator will have a negligible effect on the overall disposal capacity of the WENT Landfill.

(4) Waste Disposal during Non-Standard Operating Conditions

If the Animal Cremator ceases to function for a period longer than that could be absorbed within the on-site storage system, an alternative means of disposal of the animal carcasses shall be required. It is anticipated that in such an event, the animal carcasses shall be disposed of to the WENT Landfill, as is currently practised for such wastes.

The Contractor shall ensure that a storage facility shall be provided, having a capacity equivalent to at least the total waste inputs for animal carcasses incineration for 2 days.

6.5 Ecology

The subject site is located in the Deep Bay Catchment area. Mitigation measures as described in *Section 6.2* shall be provided to ensure effluent discharge of the Animal Cremator would not create any adverse water quality impact during both construction and operation.

6.6 Hazard to Life

Safety measures of dangerous goods shall be implemented for the transportation, handling, storage and use of fuel oil for cremator operation.

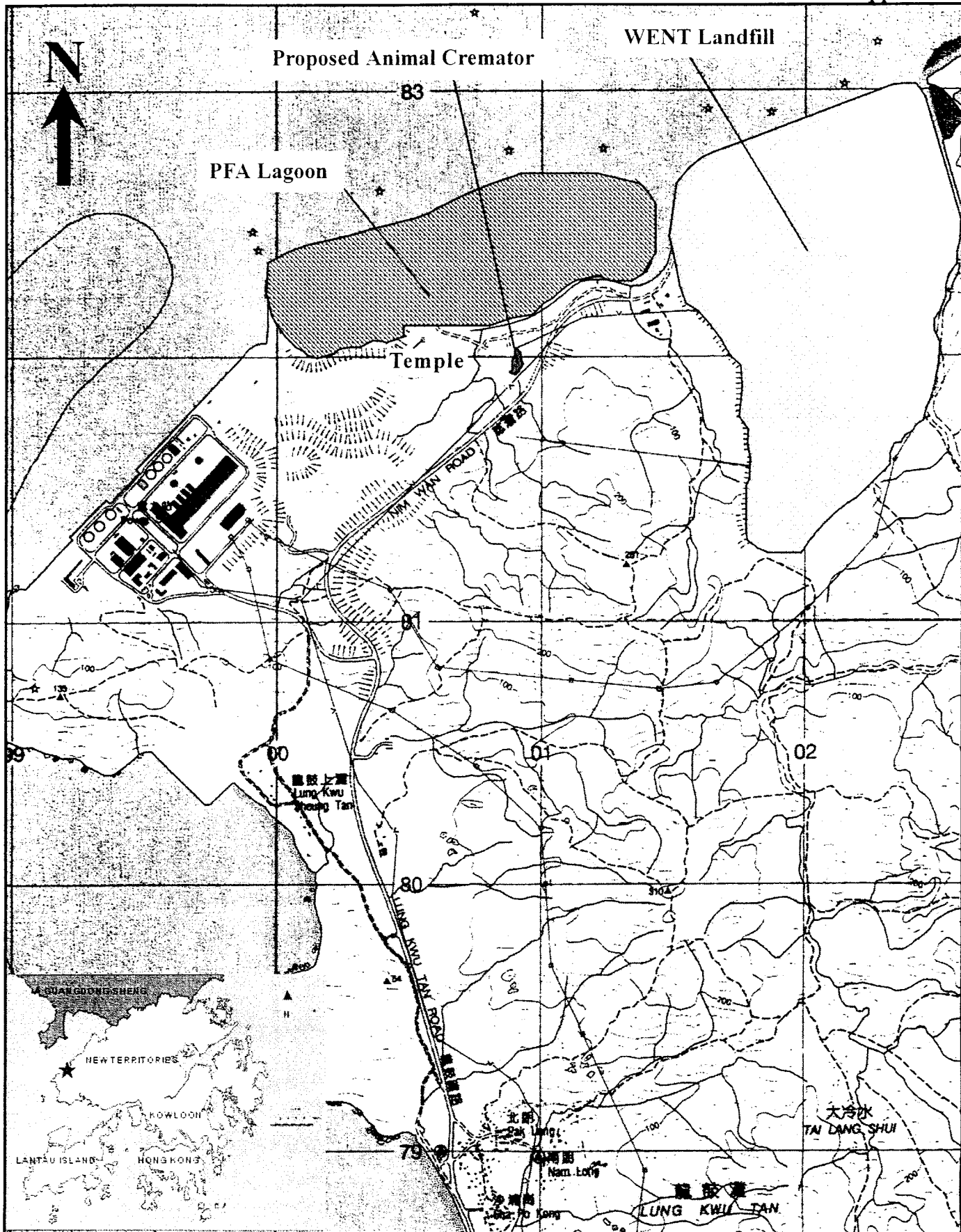
7. PUBLIC CONSULTATION

We have informed the Tuen Mun Provisional District Board on 7.9.1999 that we intend to carry out an EIA study of the proposed Animal Cremator.

8. USE OF PREVIOUSLY APPROVED EIA REPORT

The results of the following previously approved EIA report is used in preparing this Project Profile :

Centralised Incineration Facility (CIF) for Special Wastes : Vol. 2 - EIA Final Report, prepared and issued in February 1995 by ERM-Hong Kong, Ltd. under the supervision of EPD. The subject EIA report has been approved by the Director of Environmental Protection and deposited in the EIAO's Register.

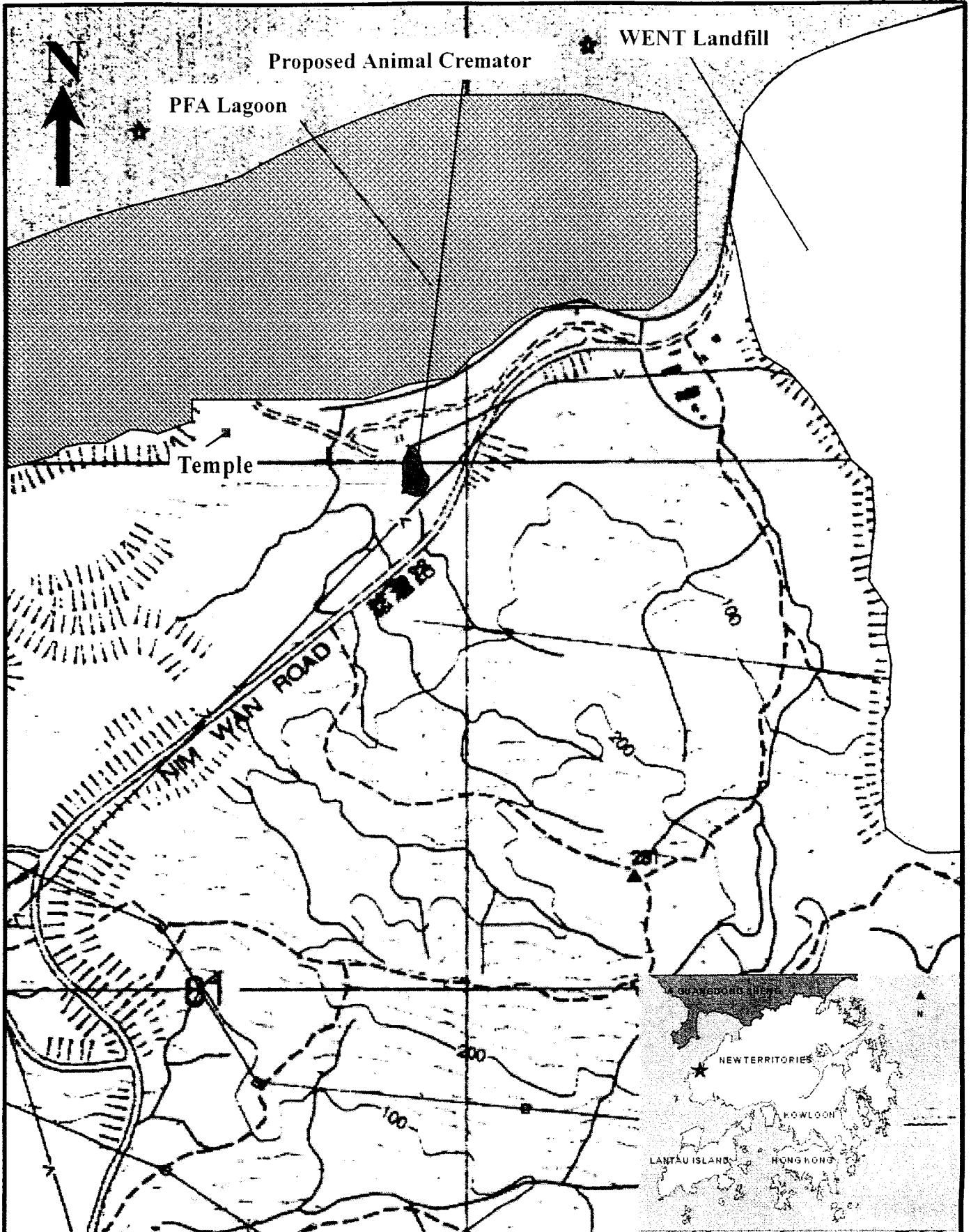


Environmental
Protection
Department

Proposed Animal Cremator Site

Legend

- ★ Project Site
- Scale 1:20000
- Date 14.7.1999



Environmental
Protection
Department

Proposed Animal Cremator Site

Legend

★ Project Site
Scale 1:10000
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