

1.0 Basic Information

1.1 Project Title

Decommissioning of a clinical waste incinerator at Pok Oi Hospital.

1.2 Purpose and Nature of the Project

It is planned to redevelop and expand Pok Oi Hospital to serve the anticipated increase in demand of health care services in the North New Territories. As part of the redevelopment and expansion programme, an existing incinerator, which ceased operation since August 1998 will be demolished.

1.3 Name of Project Proponent

Hospital Authority

1.4 Location and Scale of Project

The existing Pok Oi Hospital is situated along Castle Peak Road, Yuen Long. Figure 1-1 shows the location of the hospital and its surrounding landuses. The major existing buildings to be demolished include the Main Building (South Wing, Central Wing, North Wing and associated Staff Quarters), Boiler Room, ODP/ Accident and Emergency (A&E) Building, and Jockey Club Care and Attention Home (C&A Home).

The incinerator to be demolished is located at a partitioned room of the Boiler House. Location of the incinerator room is as shown in Figure 1-2. The incinerator flue leaves the incinerator room and runs horizontally until reaching the external façade of the North Wing (southern portion). The flue then runs vertically along the external façade of the Main Building.

In order to allow the redevelopment programme to proceed as scheduled, the existing old buildings, including the Boiler Room and waste incinerator, at Pok Oi Hospital have to be demolished.

The incinerator furnace consists of two combustion chambers, each with a capacity of 0.5m³. The incinerator was put into service since 1988 and ceased operation in August 1998. The normal hours of operation during the period was 4 to 5 hours per day and 6 days per week. Average quantity of waste incinerated per day was in the order of 8 bags (39 inch (H) x 15 inch (W)) per day. Maintenance and repairing of the incinerator were provided by a contractor recruited during its operational period. No recorded accidents occurred during the operations of the incinerator.

Waste generated from the operation of the hospital incinerated during the period include, wastes generated from laboratories, tissues or organs or other wastes from the Operating Theatre, dressing with blood waste from A&E Department or wards, and unused drug waste.

1.5 Number and Type of Designated Project to be covered by the project profile

Under item 3 in Part II, Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance, decommissioning of the clinical waste incinerator at Pok Oi Hospital is classified as a designated project. Therefore, an Environmental Permit must be obtained before conducting the decommissioning works.

1.6 Name and Telephone Number of Contact Person(s)

2.0 Outline of Planning and Implementation Programme

2.1 Project Implementation

Decommissioning of the incinerator will be carried out by the same contractor commissioned to carry out the overall demolition programme.

2.2 Project Timetable

It was planned to complete the demolition works, including the decommissioning of the incinerator by end of January 2002 in order to allow the overall redevelopment programme to be completed as scheduled under the programme.

2.3 Interactions with Broader Programme Requirements

Decommissioning of the incinerator will be carried out along with other demolition works under the redevelopment programme by the same contractor. The contractor contract period will come to an end in January 2002. Decommissioning of the incinerator will have to commence as early as possible to allow the boiler house and the overall demolition works to be completed by the contractor.

3.0 Possible Impact on the Environment & Environmental Protection Measures

3.1 Introduction

In accordance with “A Guide to the Registration of Chemical Waste Producer” issued by Environmental Protection Department, incineration ash generated from the incineration process is classified as a chemical waste.

During the operation of the incinerator, emission control was achieved through proper design of the combustion furnace as described in the design manual of the equipment. The primary and secondary combustion chambers are separated by a matrix of venturi filter panels. The panels, which contained a series of holes allowing flue gases to pass from the primary to the secondary combustion chamber, were manufactured from 1600°C quality refractory material and prefired. The panels retained large fly ash particles within the primary combustion chamber. Together with the afterburner and secondary combustion air, the panels created the necessary conditions for burnout of small particles, smokes and odours.

A visual inspection of the incinerator has revealed that there is minimal incinerator ash left in the combustion furnace and the panels. However, the chamber is considered contaminated and hence the decommissioning of the combustion furnace shall therefore be carried out with special care to ensure that any incineration residues that may contains heavy metals and dioxin are handled, transported and disposed of properly.

3.2 Containment Approach

Decommissioning of the combustion furnace shall be conducted under a containment as a prudent approach to avoid the release of any incinerator ash to the environment which could be generated during the decommissioning of the incinerator.

3.2.1 Site Preparation and Containment Construction

The first horizontal section of the incinerator flue outside the incinerator room will be taken down by losing the flanges. The flue opening on the side connected with the incineration furnace shall be sealed with 2 layers of fire retardant polythene sheets.

Preliminary site decontamination of all debris shall be carried out using HEPA vacuum cleaner. Except the incinerator, all other existing items shall be removed from the incinerator room as far as practicable to avoid obstructing the subsequent work activities. The walls, floor and ceiling of the incinerator room shall then be lined with 3 layers of fire retardant polythene sheets. At the entrance to the incinerator room, a 3-chamber decontamination unit shall be constructed for entry and exist from the work area. The walls of the room shall be used as the boundary for the segregation. All workers must carry out decontamination procedures in this unit every time they leave the work area. Warning signs in both Chinese and English should be put up in conspicuous areas.

The 3-chamber decontamination unit shall comprise a dirty room, a shower room and a clean room of at least 1m x 1m base each with 3 layers of fire retardant polythene sheet where the worker shall carry out decontamination before leaving the work area. All bagged material shall egress the containment through the decontamination unit after thorough cleaning.

An air mover shall be provided to exhaust air from the work area. Sufficient air movement shall be maintained to give a minimum of 6 air changes per hour to the work area, and maintain a negative pressure of 0.05-0.15 inches of water within the work area throughout the entire course of the decommissioning works. A pressure monitor with printout records and audible alarm shall be installed at an easily accessible location to demonstrate that the negative pressure is maintained. A standby air mover shall be made available for use. New pre-filters shall be used at the air movers. HEPA filters shall only be installed in the maintenance workshop.

A copy of the maintenance records of the air movers should be kept on site for inspection upon request. The appointed contractor shall also check the differential pressure of the air mover to make sure the filter is not blocked. A differential pressure above 0.2 inches of water indicates that the filters would need to be changed. All items remain inside the containment should be covered with at least 2 layers of fire retardant polythene sheets before the decommissioning works should proceed.

3.2.2 Smoke Test

Before commencement of the decommissioning work, a smoke test with non-toxic smoke shall be carried out to ensure the air-tightness of the containment. Also check whether there are stagnant air pockets indicated by an aggregate of smoke that cannot effectively be extracted. After a successful test, switch on the air mover to exhaust smoke from the containment and to give a minimum of 6 air changes per hour, and check visually to see that the absolute filters screen out the smoke effectively and if the pressure gauges read normal. If not, the air mover shall be sealed up and returned to the supplier workshop for necessary servicing, and replaced by a tested air mover. The normal reading pressure range for maintaining 6 air changes per hour shall be 1.5-4 mm/0.05-0.15 inches of water or equivalent (negative pressure). The audible alarm's integrity should also be checked and the trigger shall be at <1.5 mm/0.05 inches of water (negative pressure). Otherwise securely seal up all openings before switching off the air mover.

3.2.3 Removal Method

All workers shall wear full protective equipment, disposable protective coverall (such as Tyvek) (with hood and shoe covers), inner and outer nitrile gloves, rubber boots (or boot covers), and full-face positive pressure respirators equipped with a combination cartridge that filters particulate and removes organic vapour. The organic vapour protection is an added level of insurance against the unlikely exposure to any vapour as a precautionary measure.

The top vertical section of the incinerator flue shall be removed first by loosening the flanges. The detached sections of the flue shall be wrapped with 2 layers of fire retardant polythene sheets. A third layer shall then be wrapped and secured with duct tape. Decontaminate the outer layer of the wrapped flue sections by wet wiping when passing them out of the containment through the decontamination unit for disposal. If a flue section is large, it should be left in the containment for later removal.

The combustion furnace, with a size of approximately 1m³, upon removal, shall be wrapped with 3 layers of fire retardant polythene sheets. The outermost layer shall be secured with duct tape.

Workers shall carry out decontamination in the 3-compartment decontamination unit and have the used coveralls, nitrile glove, and rubber boots disposed of as chemical waste in the dirty room.

All wastewater generated within the decontamination unit shall pass through a filtration system for removal of particles down to 5 micron in suspension, before being discharged into the drainage system.

After completion of removal, decontaminate all surfaces, including the wrapped incinerator chambers and flue sections left within the containment, by wet wiping and HEPA vacuum. Then spray the innermost layer of the fire retardant polythene sheet covering the wall, ceiling and floor with PVA. Upon drying, peel off this innermost layer of the polythene sheet covering the containment and dispose of as chemical waste.

Repeat the above decontamination procedure for the second innermost layer of fire retardant polythene sheet, including the wrapped incinerator chambers and flue sections left within the containment by wet wiping and HEPA vacuuming. After spraying with PVA, peel off this second innermost layer of the polythene sheet covering the wall, ceiling and floor and dispose of as chemical waste.

Finally, the last layer of polythene sheet shall then be taken down and disposed as chemical waste.

3.2.4 Disposal

The dismantled incinerator furnace and flue sections wrapped in polythene sheets shall be disposed of at a designated landfill site. The maximum total waste quantity is estimated to be in the order of 10m³. A disposal permit has to be obtained from the Authority.

The disposal trip ticket is required to be made available as record after disposal.

3.3 Possible Environmental Impact & Environmental Protection Measures

Given the small size of the incinerator, decommissioning of the facility is not expected to generate any significant environmental impact on the surrounding landuses. The key

focus from an environmental perspective is to avoid release of incineration ash to the environment and contamination of the onsite facilities, as well as to implement other standard environmental control measures to control any potential environmental impact on air quality, and water quality, etc.

The incinerator, with a small furnace capacity of 1m³, was constructed with a durable steel fabrication structure with temperature resistance internal surfacing lining. It was also placed on top of a concrete solid base built on top of the concrete slab of the incinerator room. Potential land contamination arising from the operation of the incinerator in the past was not identified to be a key concern.

3.3.1 Air Quality

No significant gaseous/dust emission is expected from the decommissioning/demolition of the incinerator as the work shall be carried out in an air-tight condition under negative pressure. With regard to the demolition of the associated structure (i.e. incinerator room), the requirements under the *Air Pollution Control (Construction Dust) Regulation* will be followed.

3.3.2 Noise

Demolition of the incinerator would be carried out by hand-held tools only. The demolition activities are not expected to give rise to any significant noise impact. Demolition activities are only planned during the non-restricted hours, and the noise-sensitive facilities that will remain in operation during the demolition works are provided with air conditioning and do not rely on operable windows for ventilation.

Given the limited quantity of demolition waste associated with the decommissioning of the incinerator, traffic associated environmental impact is not identified to be a key concern.

3.3.3 Water Quality

The works are not expected to generate a significant quantity of wastewater. Any wastewater generated from the decontamination unit or within the containment shall pass through filtration system for removal of particles down to 5 micron in suspension before being discharged into the drainage system.

3.3.4 Waste Management Implications

As a prudent approach, the polythene sheets wrapped incinerator furnace and flue sections shall be regarded as chemical waste, and shall be placed into appropriate containers such as drums, jerricans, or heavy duty and leak-proof plastic bags made in accordance with the specifications as set out in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Potentially contaminated waste generated from the dismantlement of the containment and decontamination units, and cloth used in

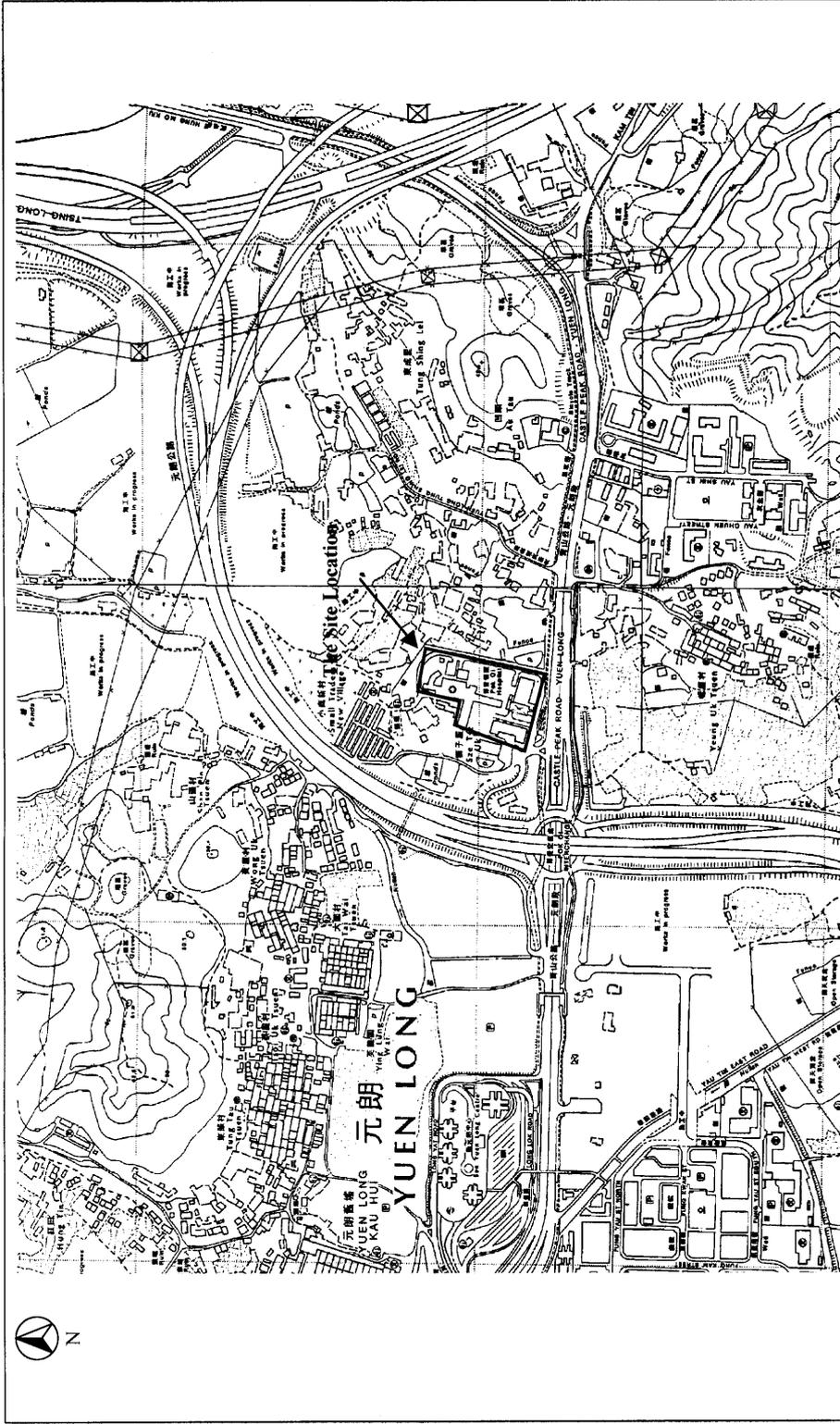
wet wrapping, etc. shall also be disposed of as chemical waste. The maximum total quantity of waste to be handled was estimated to be in the order of 10m³.

3.3.5 Unsightly Visual Appearance

The decommissioning/demolition of the incinerator will be carried out inside the existing Incinerator Room, no particular unsightly visual appearance is envisaged.

4.0 Use of Previously Approved EIA Reports

A Preliminary Project Feasibility Study (PPFS), including a Preliminary Environmental Review (PER) has been carried out for the project. The findings of the PER confirm that it is not necessary to carry out an EIA for the project.



Title: Location of the Hospital and its Surrounding Landuses

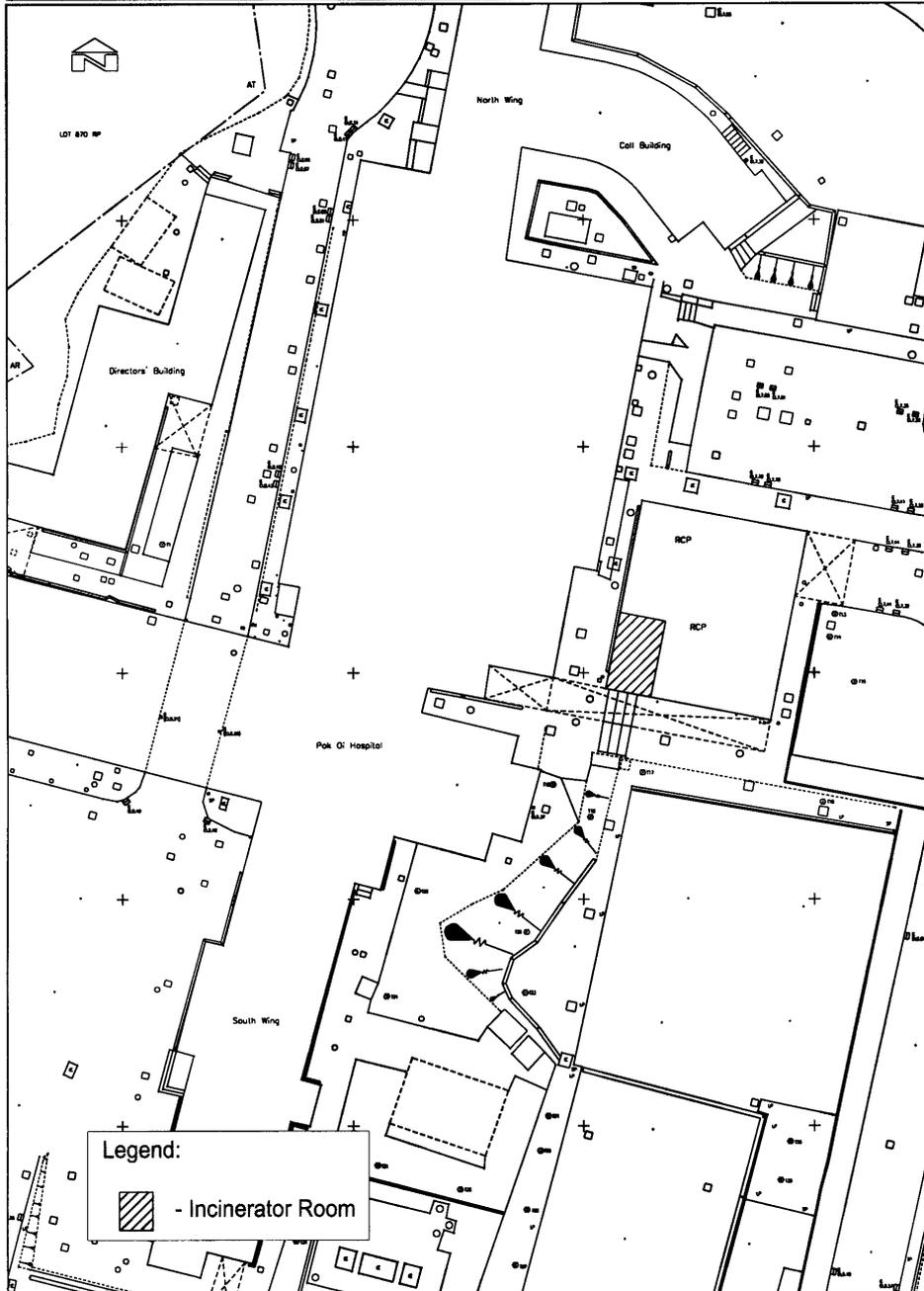
CH2M HILL (China) Limited

Project: Decommissioning of a Clinical Waste Incinerator at Pok Oi Hospital

Scale: NTS

Figure: 1-1

November, 2001



Title: Location of the Incinerator Room	CH2M HILL (China) Limited
Project: Decommissioning of a Clinical Waste Incinerator at Pok Oi Hospital	Scale: NTS Figure: 1-2