

Northeast New Territories (NENT) Landfill Extension

1. PURPOSE OF PROJECT PROFILE

1.1 This project profile sets out the scope of the environmental issues associated with a proposed extension of the existing Northeast New Territories (NENT) Landfill at Ta Kwu Ling for the application of an Environmental Impact Assessment (EIA) study brief. This extension is regarded as a designated project under G.1, Schedule 2 of the EIA Ordinance.

2. BASIC INFORMATION

2.1 Project Title

Northeast New Territories Landfill Extension

2.2 Purpose and Nature of the Project

In order to maintain the availability of landfill capacity for the cost-effective and environmentally satisfactory disposal of wastes, the Director of Environmental Protection commissioned in February 2000 a study on “Extension of Existing Landfills and Identification of Potential New Waste Disposal Sites”. Completed in 2003, the study proposed a long term Strategic Plan for the development of landfill extensions and new landfill sites. The NENT Landfill Extension forms an integral part in the Strategic Plan in maintaining the availability of landfill capacity in the North East New Territories. The project is to develop, operate and restore the NENT Landfill Extension. The NENT Landfill Extension is planned to commence operation in 2009 with an estimated capacity of 19M cum.

2.3 Name of Project Proponent

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

2.4 Location and Scale of Project

The extension site is located in a valley covering mainly the existing NENT Landfill Stockpile and Borrow Area that was formed to the east of the existing landfill as part of the original site development of the landfill (see **Figure 1**). The extension site covers an area of about 70 ha. The existing NENT Landfill Stockpile and Borrow Area is zoned “Other Specified Uses (Landfill)” on the

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approved Wo Keng Shan OZP No. S/NE-WKS/3. The remaining part of the extension site extends into the surrounding “Green Belt” zone. Approval from Town Planning Board on rezoning of the affected “Green Belt” zone would be required. The current OZP would also need to be amended accordingly.

2.5 Number and Types of Designated Projects to be covered by the Project Profile

There is only 1 designated project under this project profile, and it is a landfill for waste as defined in the WDO.

2.6 Name and Telephone Number of Contact Person(s)

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3. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

3.1 Project Implementation

- 3.1.1 As part of the study “Extension of Existing Landfills and Identification of Potential New Waste Disposal Sites”, a Strategic Environmental Assessment has been conducted to identify and assess the broad environmental issues associated with the NENT Landfill Extension.
- 3.1.2 The detailed EIA study for this Designated Project will be carried out by consultants to be employed by the Project Proponent.
- 3.1.3 The project is planned to be implemented through a design, build and operate (DBO) contract. The contractor to be employed for the project will be responsible for:
- (i) detailed design of the landfill
 - (ii) site formation, drainage diversion and preparation
 - (iii) installation of liner system
 - (iv) provision of leachate collection, treatment and disposal system
 - (v) provision of landfill gas collection and management system
 - (vi) operation and environmental monitoring of the landfill
 - (vii) restoration and aftercare

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3.2 Project Programme

The project programme is scheduled as follows:

(i)	commencement/completion of the feasibility/EIA study	Oct 2004/ Jun 2006
(ii)	commencement of Town Planning Ordinance procedures	Oct 2004
(iii)	complete land resumption clearance	Mar 2008
(iv)	award project contract	Mar 2008
(v)	start landfill operation	Mar 2009

4. POSSIBLE IMPACTS ON THE ENVIRONMENT

Possible impacts on the environment during the construction, operation and aftercare phases of the NENT Landfill Extension have been broadly assessed through the Strategic Environmental Assessment mentioned in 3.1.1. The assessments are summarized below. **Figure 1** shows the location of identified sensitive receivers.

4.1 Air Quality

The potential air quality impact from the project would be:

- the dust and exhaust emissions from on-site plant during landfill construction and operation
- gaseous emissions during landfill operation and aftercare
- odours arising during the operation of the landfill from waste decomposition and leachate treatment
- gaseous emissions from vehicles transporting waste during landfill operation

The Air Sensitive Receivers (ASRs) within 500m of the landfill extension are a number of village houses in Tong To Shen Tsuen and Wo Keng Shan. Beyond this boundary lies the village of Lin Ma Hang some 900m from the site which is unlikely to be affected by the extension.

The site lies within a hilly area with turbulent airflow. There are no significant topographic features between the site and the ASRs. Although the site is located within the Deep Bay Airshed, it is unlikely that air would stagnate within its vicinity because of prevailing winds.

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Previous studies on the existing NENT Landfill (the NENT Landfill Study in 1988 and the Supplementary Environmental Impact Assessment (SEIA) in 1995) predicted no significant air quality impacts arising from the construction and operation of the landfill.

4.2 Noise

Potential noise sources will be site formation works, infrastructure construction, landfilling operation and waste collection vehicles entering and leaving the site.

Given the remote location of the site, there are few Noise Sensitive Receivers (NSRs) in the area. An assessment of potential noise impacts arising from the construction and operations of the existing NENT Landfill was conducted by the landfill operator in 1995 as part of the SEIA. Impacts were predicted to be within acceptable levels. It is envisaged that the traffic flow arising from the operation of the NENT Landfill Extension would be similar to that of the existing landfill.

4.3 Water Quality

If not managed properly, the landfill has the potential to cause the following water quality impacts:

- sediment-laden run-off escaping from the site during landfill construction
- improper discharge of effluent from the leachate treatment plant during operation and aftercare
- polluting leachate leaking into surface or underground water regime during operation and aftercare

Uncontaminated surface runoff discharges are not considered to be a potential source of impact.

A stream located in the valley of Lin Ma Hang is close to the site and is a Water Sensitive Receiver (WSR) by virtue of its ecological sensitivity. From experience gained from the development and management of the existing NENT Landfill, pollution to adjacent streams and groundwater resources can be prevented by proper design and construction of lining system and runoff/leachate management systems and good site practices.

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4.4 Waste Management/Disposal Impacts

Given the remote location of the site, the conceptual design will be based on a balance of materials, i.e. there will be no significant import or export of soil materials. To construct the landfill bowl, about 8.5M cum of material would need to be excavated, which would be used as filling and covering materials within the site.

4.5 Landfill Gas and Other Hazardous Materials

The extension site is within the 250m consultation zone of the existing NENT Landfill and a Landfill Gas Hazard Assessment would be required during the EIA study.

Although the extension site would generate significant amount of landfill gas during the operation and aftercare phases, the landfill would be designed as a containment landfill with an efficient landfill gas collection system that would eliminate off-site migration. There are no sensitive receivers or pathways within 250m of the site and therefore no potential off-site landfill gas hazards are envisaged.

Some chemicals and hazardous materials may be stored, handled and transported to/from the site (e.g. chemicals for wastewater/leachate treatment, waste oils, fuels). Details on the quantities and characteristics of these chemicals and hazardous materials, and the required handling procedures would be reviewed and developed in the EIA study.

4.6 Ecology

There are a number of ecologically important/sensitive sites in the adjacent environment. **Figure 1** shows the locations and extent of the ecologically sensitive areas.

The Robin Nest is located in close proximity to the existing landfill. It is a site of botanical significance and supports a number of flora and fauna species. A detailed ecological survey would be carried out to evaluate the potential impact due to the development of the extension site.

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To the north of the extension site is the Lin Ma Hang Lead Mine SSSI, which is one of the most important bat colonies in Hong Kong. This site is located almost 1 km from the extension site and is unlikely to be adversely affected.

Lin Ma Hang Stream is a typical lowland freshwater system and has a rich collection of primary freshwater fish including several rare and uncommon species. Although there is a buffer of approximately 200m between the stream's headwaters and the northern-most extent of the site, the EIA study will evaluate the potential impact and consider the incorporation of suitable contract provisions to protect the stream.

4.7 Fisheries

As the site lies totally inland, there will be no impacts to marine fisheries. In addition, there is no freshwater fish-farming in the vicinity that would be disturbed by the project.

4.8 Cultural Heritage

Commissioned by the Antiquities and Monuments Office of the Leisure and Cultural Services Department, an archaeological survey and assessment was conducted around the extension site in 2001. The archaeological team identified a "Settlement District", with Tong To Shan as its center, dated from the first half of the 17th century to the early 20th century. The settlement district is situated adjacent to the extension site. **Figure 1** indicates the areas of archaeological importance. Opportunities to maximize the preservation of the features in the settlement district would be pursued in the EIA study.

4.9 Landscape and Visual

The broad assessment of landscape and visual impact provided in the Strategic Environmental Assessment (SEA) is summarized below. A detailed landscape and visual impact assessment will be carried out in the detailed EIA for this project.

The area of landscape in which the site lies is designated "GB" and "OU" under the Wo Keng Shan OZP.

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Because of the remote location of the site, there are no large areas of population close to the site. Across much of the visual envelope close to the site, views are significantly interrupted by vegetation, buildings or small landforms. Hikers walking close to the extension site will be exposed to visual impacts during construction/operation phase. For all other visual sensitive receivers, visual impacts will be slight or insubstantial. After being restored, the landfill will appear as a largely vegetated upland landform and residual visual impacts will be reduced to insubstantial for most visual sensitive receivers.

5. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

As discussed in Section 2.4, the extension site falls mainly within the existing NENT Landfill Stockpile and Borrow Area zoned “Other Specified Uses (Landfill)” on the approved Wo Keng Shan OZP No. S/NE-WKS/3. Remaining part of the site extends into the surrounding “Green Belt” zone.

Existing sensitive receivers in the environment would mainly be the nearby villages as described in Section 4.

The existing NENT Landfill locating next to the extension site was commissioned in 1995 and receives waste delivered by road. This inland landfill occupies approximately 70 ha. Currently, NENT Landfill is receiving around 500 loads of waste (~3,200 tonnes) via Wo Keng Shan Road everyday.

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

6.1 Air Quality

A comprehensive landfill gas management (collection and treatment) system similar to the one installed at the existing NENT Landfill would be installed. With generic good landfill design and operational practice, it is unlikely that any construction, operation or aftercare activities would have a significant impact on ASRs.

Moreover, good site practice would include reduction of dust and odour by:

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- paving and subsequent regular sweeping of long term haul roads within the site
- regular damping of unpaved roads
- vehicle washing before leaving site
- immediate cover to odorous waste (e.g. sludge) after disposal
- daily covering of the current tipping face with inert material (e.g. selected construction & demolition materials, tarpaulin covers, foam spray etc.)
- interim cover of any operational areas which are not currently in use
- proper operation and maintenance of leachate collection/management system
- proper operation and maintenance of landfill gas collection/combustion facilities

6.2 Noise

Noise generated during the construction stage is not expected to cause a significant increase to that generated by the operation of the existing NENT Landfill. There are few NSRs within 300m of the site and based on the findings of the existing SEIA for the NENT Landfill, noise impacts could be mitigated.

During construction, the topography of the site provides natural acoustic shielding, nevertheless, good site practice will be incorporated as contract requirement. This would include using only powered mechanical equipment with built-in acoustic shielding and not using percussive piling. Where necessary, temporary noise barriers or earthbunds could be constructed.

During operation, it is likely that the most significant noise source would be from landfill-related vehicular traffic on the internal haul roads and the access road. Minor sources would be from on-site plant such as leachate treatment works, pumps, generators and the flare. Appropriate mitigated measures would be carefully assessed and developed in the EIA study.

6.3 Water Quality

Leachate and other wastewater

Leachate will be generated from the extension site as soon as waste placement commences. The estimated quantity of leachate would be around 600 – 1,300 m³/day. The overall quantities of leachate generated from the extension site and the existing NENT Landfill can be minimized by:

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- Minimizing the active tipping face especially during wet season
- Ensuring that capping of the existing NENT Landfill is carried out to a high standard and in the shortest possible time.
- Increased leachate recirculation within the existing NENT Landfill following capping to increase leachate retention time and hence smooth out any temporary peak in leachate generation.

The leachate generated both from the extension and from the existing NENT Landfill will be treated at the existing Leachate Treatment Works where possible, prior to its disposal to Shek Wu Hui Sewage Treatment Works (SWHSTW). If there is a need to increase the leachate treatment capacity to cope with the temporary increase in flow as described above, the existing Leachate Treatment Works could be upgraded, or a separate plant would be installed for the extension where necessary. The potential impact of the additional pollutant loadings of the pretreated leachate to SWHSTW would also be addressed in the EIA study.

Similar to arrangement at the existing landfill, wastewater generated from the workforce during the construction and operation of the landfill extension would be collected and discharged to the on-site Leachate Treatment Works for treatment prior to disposal.

Surface Water

The EIA study would assess the potential impact of the existing drainage system due to the development of the extension site and recommend mitigation measures to control surface run-off. Reference would be made to DSD Technical Circular TC14/2000 and ProPECC Note 1/94 in managing the surface runoff during construction period.

Following restoration, drainage would run off from the landfill surface to the perimeter. The perimeter drainage channels would direct the flow to two main discharge areas located at the toe of the northern and southern bunds respectively. The drainage to the south would then follow existing drainage courses presently running through the landfill infrastructure whereas drainage to the north runs into stream courses flowing into Sham Chun River approximately 1.5 km to the north.

Storm water run-off generated during construction and operation of the extension site may contain elevated concentrations of suspended solids, as well as oils and

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other contaminants from road surfaces. Treatment of run-off water may be carried out using settlement tanks to remove suspended solids, and oil interceptors to remove oil and grease.

The quality of the discharge would be regulated by means of a Discharge Consent issued in accordance with the WPCO TM for discharge to Inland Waters.

6.4 Waste Management

All waste materials would be stored, handled and transported in compliance with the Waste Disposal Ordinance (Cap 354) and subsidiary regulations such as the Waste Disposal (Chemical Waste) (General) Regulations.

6.5 Ecology

Due to the close proximity of the Lin Ma Hang Stream and the Robin's Nest to the extension site, special provision would be incorporated into the contract documents to ensure that these sensitive areas are afforded maximum protection. Specific mitigation measures to protect the Lin Ma Hang Stream and alleviate potential ecological impacts on the surrounding ecological sensitive areas (e.g. control of run-off from the landfill extension into the stream and re-vegetation) will be developed based on the findings of the detailed ecological impact assessment.

6.6 Fisheries

As the site is totally land based, there will be no impacts to marine fisheries. Furthermore, there is no freshwater fish-farming in the area that would be distributed by the project.

6.7 Cultural Heritage

The Tong To Shan Settlement District is a site of cultural and historical significance. Some stone structural features, slope protection walls, paths and graves were identified. Heritage impact of the landfill extension on the Tong To Shan will be reviewed and appropriate mitigation measures will be designed and implemented.

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6.8 Landscape & Visual

It is envisaged that the restored site would blend in with the restoration of the original NENT Landfill, and that both should blend in with the surrounding natural landscape. If the restored landfill is to be made available for low-intensity recreational use, hiking trails and panoramic lookout points with viewing pavilions could be provided.

7. PUBLIC CONSULTATION

The North District Council (NDC) would be consulted during the course of the EIA study.

8. HISTORY OF SIMILAR PROJECTS

The project is similar to the development of the three existing strategic landfills in Hong Kong.

9. USE OF PREVIOUSLY APPROVED EIA REPORTS

Supplementary Environmental Impact Assessment Report – ERM Hong Kong (1995)

Final Strategic Environmental Assessment Report for the Extension of Existing Landfills and Identification of Potential New Waste Disposal Sites – Scott Wilson Hong Kong (2003)

Waste Facilities Business Unit

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