

20. WENT LANDFILL EXTENSIONS SITE

20.1 Basic Information

Project Title

20.1.1 WENT Landfill Extensions Sites (WLES).

Nature of Project

20.1.2 The Project would form two new landfills (*Figure 20.1*) previously designated as:

- WENT A Landfill Extension
- WENT B Landfill Extension

20.1.3 The WLES would be designed to accept waste from the time at which the disposal capacity of the existing WENT Landfill has been reached.

WENT A Landfill Extension

20.1.4 The project involves formation of a new landfill, adjacent to the existing WENT Landfill by forming a series of stepped terraces, due to the steep rise in topography. The design assumes that the landfill bowl would be formed with slopes cut in a series of benches with overall gradients of 1(V) on 1.5(H) for soil and 2(V) on 1(H) for rock.

20.1.5 Because of its small capacity, it is unlikely that it would be viable to open the WENT A Extension as a completely “stand-alone” landfill under a separate contract. It is envisaged that this project would be procured through competitive tendering but with certain services provided by the existing landfill contractor. Construction works would be as described in Section 3.4 (Part A). In addition specific issues for the WENT A Extension would include:

- Delivery of waste by road-vehicle or by marine vessel.

20.1.6 The WENT A Extension could share the following infrastructure with the existing WENT Landfill:

- Weighbridges, wheel washing and vehicle cleaning facilities.
- Facilities for recording and processing waste inputs and other site activities.
- Accommodation for Government supervisory staff and Independent Consultants.
- Leachate treatment
- Container handling areas.

WENT B Landfill Extension

20.1.7 The WENT B Landfill Extension is located in the area to the west of the WENT A Landfill Extension and requires the realignment of Nim Wan Road. The project involves the formation of a series of terraces, increasing in height towards the south.

20.1.8 If it is assumed that the WENT B Extension would be constructed as a “stand alone” facility, procured through competitive tendering, construction works would be as described in Section 3.4 (Part A). In addition specific issues for the WENT B Extension would include:

- Delivery of waste by road-vehicle or by marine vessel.

20.1.9 If, however, the project was constructed as an “addition” to the existing WENT Landfill, procured through a negotiated extension with the existing landfill contractor, then a number of facilities could be shared, thus reducing the scope and cost of the works.

Location and Scale of Project

20.1.10 The site is located in the North West New Territories (NWNT) some 5km north-west of Tuen Mun, overlooking Deep Bay. The site is 175ha overall.

- 20.1.11 The WENT A Landfill Extension is located in Tsang Kok valley, immediately to the west of the existing WENT Landfill. The Castle Peak Firing Range lies to the south of the existing WENT Landfill and the WENT A Landfill Extension. The valley extends at its southern end into the Firing Range; however, the project is to utilise the northern part of the valley only, with the area of waste disposal not extending into the Firing Range Proper. The WENT A Landfill Extension is a small extension, with a net void capacity of 6Mcum assuming balanced earthworks.
- 20.1.12 The WENT B Landfill is a significantly larger scheme than WENT A, with a net void capacity of 65Mcum, assuming balanced earthworks.
- 20.1.13 For the remainder of this SEA, the WENT A and WENT B will be referred to as the WENT Landfill Extensions Sites (WLES), since they are located adjacent to each other and, if selected would be investigated further together.

History of Site

- 20.1.14 The existing WENT Landfill was commissioned in 1993 and receives publicly collected waste from the North West New Territories by road. Waste is received by marine vessel from a number of Refuse Transfer Stations comprising Island East, Island West, West Kowloon, Outlying Islands and North Lantau. Waste is also transferred by road from the NWNT Refuse Transfer Station near Yuen Long.
- 20.1.15 The existing landfill also receives containerised sludges from various Sewage Treatment Works, including the Stonecutters Island Sewage Works constructed under SSDS.
- 20.1.16 The existing landfill is a coastal site and occupies an area of approximately 106ha. Approximately 20ha of the site was formed by reclamation from the sea, using the soil and rock excavated from the site formation for the landfill void as filling material. Some of the initial formation works were carried out under a CED contract which included an initial area of the site ready for waste deposition, formed an area of reclamation, and constructed a waste reception area, a leachate pumping station and pumping main.
- 20.1.17 The WENT Landfill Contract was subsequently awarded by EPD to Swire BFI Waste Services Ltd (now Swire SITA Waste Services Ltd) in 1993, and was the first of the three Strategic Landfill Contracts to be awarded on a Design-Build-and-Operate basis.

Number and Types of Designated Projects Covered

- 20.1.18 The WLES would be a Designated Project under the following Schedules of the EIAO:
- G1 - A landfill for waste as defined in the Waste Disposal Ordinance (Cap 354)
 - G4 - A waste disposal facility for refuse.

20.2 Outline of Planning and Implementation Programme

- 20.2.1 A generic outline for the planning and implementation is summarised in Section 3.5 (Part A), and a specific outline programme for the WLES is shown in *Figures 20.2A and 20.2B*.

20.3 Possible Impacts on the Environment

- 20.3.1 Possible impacts on the environment during the construction, operation and aftercare phases of the WLES are outlined below. *Figure 20.1* provides details of identified sensitive receivers. The individual assessments are summarised in *Tables 20.1 and 20.2*.

Air Quality

- 20.3.2 There are Air Sensitive Receivers (ASRs) found within a 500m radius from the boundary of this site, with the closest being the CLP Black Point Power Station that is 400m west of the site boundary. There are other ASRs located in the village of Ha Pak Nai, which is situated 1km to the east and Pak Long and Nam Long, which are 1.8km to the south.

- 20.3.3 The site lies within a hilly area, with turbulent air flow; although there are no significant topographic features between the site and the ASRs. Although the site is located within the Deep Bay Airshed (north-easterly), it is unlikely that air would stagnate within the vicinity of the site because of prevailing winds, which blow away from ASRs at Ha Pak Nai. Black Point Power Station is located just outside of the Deep Bay Airshed. A proposed Waste-to-Energy Facility is located at Ha Pak Nai, though it is yet to be confirmed. These developments will generate emissions that may be cumulative to the emissions from the WLES. It is possible that the topography will change after the completion of landfilling of the WLES and the dispersion pattern may differ. Therefore, cumulative air quality impacts due to this site should be carried out at the EIA study stage.
- 20.3.4 Whilst the duration of parallel operation of existing WENT Landfill and the WLES would be minimal, there is scope for cumulative odour impacts from the WLES and the existing WENT Landfill, to impact residents in Ha Pak Nai. Therefore, design and operational procedures / monitoring of the WLES should take this into account to minimise the impacts.
- 20.3.5 The site is located in a remote area. Existing developments include the original WENT Landfill, CLP's Black Point Power Station (and PFA lagoons) and the Castle Peak Firing Range. Planned developments may include additional waste management and waste to energy infrastructure projects, however, these have yet to be confirmed. There are also plans to construct the Deep Bay Coastal Road along an alignment to the west and north of the existing WENT Landfill. This scheme would upgrade the existing Nim Wan Road and provide a link between the Proposed Lingdingyang Bridge (which has a tentative landfall near Black Point Power Station) and the Shenzhen Western Corridor (which has a tentative landfall to the east of the existing landfill near Ngau Hom Shek). Given the preliminary nature of this SEA, and the uncertain status of planned projects, the issue of surrounding developments should be reviewed in subsequent, more detailed, studies. The key is to develop a design that has minimal impacts.
- 20.3.6 The information currently available from studies for adjacent facilities indicates that the overall impacts are acceptable. Cumulative impacts would not be anticipated, however, this should be reviewed at later stage.
- 20.3.7 It should also be noted that previous studies (*WENT Landfill Conceptual EIA* in 1987 and the *Supplementary Environmental Impact Assessment* in 1993) on the existing WENT Landfill reported that no significant air quality impacts were expected, provided that on-site mitigation measures (predominantly dust suppression on haul roads) were fully implemented.
- 20.3.8 The existing WENT Landfill has both marine frontage and road access for waste delivery. It is assumed that the future WLES will utilise similar transportation arrangements. The total emissions of air pollutants and hence regional air quality impacts from waste delivery will likely be moderate, i.e. higher than a marine based site but lower than a land based site that relies entirely on road transport.

Noise

- 20.3.9 The landfill development has the potential to cause the following noise impacts:
- Excavation, site formation and general construction activities.
 - Heavy mobile plant used during operation.
 - Waste collection vehicles, etc. entering and leaving the site during operation.
 - Fixed plant noise.
- 20.3.10 There are unlikely to be any significant noise implications associated with this site because there are very few NSRs within 300m of the site one shrine / temple, near Tsang Tsui, is found within the site boundary, however, in the event the WLES is pursued, this would be demolished as part of the works. Identified NSRs are shown on *Figure 20.1*.

- 20.3.11 During construction and operation phases, it is possible that activities could continue into, or even through, the night-time period. This would depend upon day-to-day landfill operations and the overall landfill development programme employed by the landfill contractor.
- 20.3.12 Based on previous studies (*WENT Landfill Conceptual EIA* in 1987 and the *Supplementary Environmental Impact Assessment* in 1993) the major noise impacts at Ha Pak Nai were from the reclamation works for the existing WENT Landfill. Since the WLES does not include any reclamation works near Ha Pak Nai, it is unlikely that this community would be unduly affected by the construction or operation of the WLES.

Water Quality

- 20.3.13 The landfill development has the potential to cause the following water quality impacts:
- Sediment-laden runoff escaping from site during landfill construction.
 - Effluent from the leachate treatment plant during operation and aftercare.
 - Accidental leachate breakout into surface water drainage during operation and aftercare.
- 20.3.14 The project would cause the loss of the Tsang Kok valley; limited water impacts are expected in this respect.
- 20.3.15 The site is located in a hilly area and while there is potential for sediment-laden and leachate-contaminated runoff during construction, the fact that the majority of construction works would be undertaken within a “bowl” should negate this potential. During operation and aftercare, surface water drainage channels would be constructed to prevent significant uncontrolled runoff from the completed landfill surface area.
- 20.3.16 The assumption is made that for an operating landfill all discharges would be controlled, so that there would be no water quality impacts during operation. However, this assumption should be addressed in further detail, including a risk assessment (e.g. of a leachate breakout incident) during the detailed EIA stage of the project. The design of the landfill would have to incorporate environmental protection orientated designs to cater for such potential incidents.
- 20.3.17 Given the current pollution loading in Deep Bay WCZ and its “zero discharge” policy, it is not desirable for any additional pollutant loading to result from the construction and operation of the WLES. Therefore, stricter performance requirements may well be necessary – these would be prepared in subsequent, more detailed studies, although some suggestions are outlined in Section 20.4.

Waste Management / Disposal Impacts

- 20.3.18 Given the remote location of the site, the conceptual design provides for a material balance within the site, i.e., there is no significant import to site or export from site of materials. Lining, capping and leachate drainage would require about 3Mcum of material for WENT A and 5Mcum for WENT B and these requirements would be provided for by excavation within the site. Existing PFA lagoons are included within the footprint of the WLES. It is anticipated that the PFA would remain in place during construction of the WLES, with no requirement to excavate and relocate the PFA.
- 20.3.19 With regard to the transportation of waste to the site, waste would be delivered by both road vehicle and by marine transport.
- 20.3.20 Various potentially polluting materials may be stored, handled and transported to / from the site. Examples may include chemicals for waste water/leachate treatment, waste oils, fuel for plant working on the site, etc.

- 20.3.21 All waste materials would need to be stored, handled and transported in an agreed and appropriate manner that complies with the Waste Disposal Ordinance (Cap 354) and subsidiary regulations such as the Waste Disposal (Chemical Waste) (General) Regulation. For this assessment it is assumed that potential impacts from polluting goods would be controlled through appropriate design and management systems.
- 20.3.22 The existing WENT Landfill has both marine frontage and road access for waste delivery. It is assumed that the future WLES will utilise similar transportation arrangements. GHG impacts are considered to be moderate, i.e., higher than a marine based site but lower than a land based site that relies entirely on road transport.

Ecology

- 20.3.23 There are no Protected Areas within 500m of the WLES. The nearest Protected Areas are the Sha Chau and Lung Kwu Chau Marine Park (over 4km to the south west) and an SSSI at Sheung Pak Nai (3.5km to the north east).
- 20.3.24 The majority of this site is grassland / man made lagoons of low or no ecological value. However, there are a few small areas of mixed shrub-land and approximately 4,000sq.m of semi-mature native woodland that are of conservation value, whilst Tsang Kok Stream is largely natural.
- 20.3.25 The immature native woodland has developed from tall scrub habitat over the past 8 years, and as such is not yet old enough to support a diverse and stable vegetation community. The habitat is situated at the foot of a slope that adjoins an upland area that is naturally vegetated and has a similar community structure, albeit with more tall grasses. As such, a similar habitat type (tall scrub with tall grass) with a similar ecological function is well represented in the broader area. Furthermore, the proximity of the immature woodland to human activities at the existing WENT Landfill makes it most unlikely to attract sensitive birds or other wildlife.
- 20.3.26 Tsang Kok Stream is predominantly a natural fast-flowing and permanent stream. The natural upper and mid sections are characterized by good water quality and a typically stony substrate. The lower sections of the stream along the boundary of the existing WENT Landfill site have been culverted and are partly within the tidal range, thus influenced by marine water quality to a certain extent. The infauna of the natural stream sections is characterized by nymphs of mayfly, dragonfly / damselfly and caddisfly which are also biological indicators of good water quality. There are few fish noted in the stream. The stream community is thus moderately diverse but by no means exceptional, and the numerous other streams draining the upland area to the east would be expected to support a similar community.
- 20.3.27 It is noted that bird surveys for the WEF study identified that two bird species, namely the Little Grebe and the Little Ringed Plover, are of some conservation significance. Both species are essentially passage migrants, although they also have resident populations in the NWNT. They are localised but not uncommon.
- 20.3.28 These bird species rely on shallow wetland habitats for foraging and, in the case of the Little Grebe, nesting. The existing ash lagoons beside the WENT Landfill likely represent the principal wetland habitat in the area used by these species. As such, the loss of the lagoons for WEF formation will also eliminate this habitat and thus the attractiveness of the area to these birds. The loss of wetland habitat favoured by these species from any WENT extension would be restricted to a relatively small area for inter-tidal flats at the mouth of Tsang Kok Stream that these birds do not inhabit.
- 20.3.29 The EIA Report for the existing WENT Landfill refers to a population of the Pitcher Plant *Nepenthes mirabilis* that was found in the Tsang Kok valley, the proposed site of WENT A. All species of the genus *Nepenthes* are protected in the HKSAR under the Forestry Regulations (Cap. 96), primarily due to past over-exploitation for use in Chinese medicine. Of the species of *Nepenthes* in Hong Kong, *Nepenthes mirabilis* is the most widespread, being found on hillsides across the New Territories. Thus, whilst *Nepenthes mirabilis* is uncommon it is not considered threatened. Further investigation would be required as part of the detailed EIA for the project.

20.3.30 This area is already disturbed by the existing landfill and Black Point Power Station. However the potential for cumulative impacts exists with a number of the planned projects, referred to earlier.

Fisheries

20.3.31 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 disturbed by the WLES.

Cultural Heritage

20.3.32 Commissioned by the Antiquities and Monuments Office (AMO) of the Leisure and Cultural Services Department, Field Archaeology Consultants conducted an archaeological survey and assessment in the WLES site during August and September 2001.

20.3.33 Tsang Tsui Archaeological Site (TTAS) was identified by AMO under the preliminary project feasibility study of a *Sludge Treatment Facility* in October 2000. Archaeological relics dated to late Neolithic period (c. 2500 – 1500 BC) were unearthed at the site. Furthermore, TTAS is a recorded item of, and should be protected by, the Antiquities and Monuments Ordinance, Cap.53.

20.3.34 The site covers the existing boundary of TTAS. In this connection, the study area is of high archaeological potential. In order to ascertain the archaeological potential of the landfill extension, 44 auger holes were drilled and 8 test pits were excavated in the study area including the platform just in the front of TTAS and the gentle slope at the north-west side of an abandoned fish pond.

20.3.35 The result of the archaeological survey concluded that Nim Wan was a suitable area for human settlement well before the 1970s. However, with the construction of former BBC station, the existing WENT Landfill and the PFA lagoons, part of the area with significant archaeological deposits were very much disturbed. The result of this survey further revealed that with the exception of the existing TTAS, it is very unlikely that any further archaeological remains would be found within the site.

20.3.36 As noted above, the TTAS lies in the centre of the boundary of the proposed WLES, (see *Figure 20.1*). In view of the overall space available in the search envelope, construction of the WLES in a manner that avoids direct impact upon the TTAS (whilst providing a viable void space to achieve the aims of the Study) is not feasible. As the TTAS would be totally buried by significant depths of waste, preservation insitu is not considered a feasible option and impacts are anticipated to be significant unless the relics are relocated.

Landscape and Visual

20.3.37 *Landscape Planning Designations* – Under the Territorial Development Strategy Review (TDSR) 1995 Landscape Strategy, the northern part of the site is zoned “Development Area High Landscape Value”. The zoning allows “selected but constrained urban/suburban land use”. The southern part of the site is zoned “Conservation Area” under the TDSR “no development is envisaged” on account of its “countryside character with extensive area of high quality natural landscape”. There is no OZP covering the site (*Figure 20.4*).

20.3.38 Extension of the landfill in this area will not be consistent with the landscape planning intention for the southern part of the area and resulting impacts will be slight/moderate during construction/operation and slight thereafter.

20.3.39 *Landscape Resources* - The landscape elements of the extension site are complex and comprise:

- An upland spur falling to sea level degraded having been subject to many minor landslips.
- Degraded coastal terrain;
- Existing ash lagoons

- Stream courses which tumble down the steeply fissured slopes;
- Abandoned agriculture;
- Scrub and degraded industrial sites.

20.3.40 Landscape resources are shown in *Figure 20.3A*. The landfill will, amongst other things, affect areas of low scrub, grass, tall scrub, small areas of woodland, stream courses and degraded upland terrain. However, given the extensive disturbance already caused to the site by industrial development, roadworks and landslides and the (relatively) limited magnitude of the extension, impacts on landscape resources during construction/operation and during afteruse, will be slight.

20.3.41 *Landscape Character* - The WLES lies within two Landscape Character Areas (*Figure 20.4*). The first, the Castle Peak Uplands, is an extensive area of upland topography, which falls in a series of steep ridges and gullies to the sea. The area is generally covered in scrub and grassland although in places there are significant areas of bare earth and rock resulting from landslides and/or the presence of the Castle Peak Firing Range (*Figure 20.3*).

20.3.42 At the foot of the uplands lies the Western New Territories Coast, a low-lying narrow coastal landscape formerly characterised by dispersed villages and areas of arable agriculture on flatter areas, broken by areas of scrub and woodland. Whilst these features still exist, most fields have been abandoned and the area now contains a wide variety of incoherent and degraded features such as Black Point Power Station, WENT Landfill, highways development and storage yards.

20.3.43 The WLES will introduce a new feature into a landscape, which is already somewhat degraded by the existing WENT Landfill and by features such as power stations and ash lagoons on the coast. This will result in moderate impacts on landscape character during the construction / operation phase and slight impacts during afteruse.

20.3.44 *VSRs* - Because of the location of the site, there are no large areas of population within the primary visual envelope, although areas of Shenzhen (Shekou) have a line of sight to the WLES from some 7km (*Figure 20.5*). Visual Sensitive Receivers are listed in *Tables 20.3 and 20.4*.

20.3.45 Generally, visual impacts are offset by the indifferent visual quality of this area of the coast and in particular the presence of the existing WENT Landfill, Black Point Power Station and ash lagoons. A small number of residential VSRs in Lung Kwu Sheung Tan will be exposed to moderate visual impacts during operation of the extension. In addition, users of Nim Wan Road will also experience moderate impacts from road works and views of the landfill works (*Figure 20.6*). For all other VSRs, during construction/operation of the landfill, visual impacts will be slight or insubstantial. During the afteruse phase, impacts will be reduced to insubstantial for most visual VSRs, and slight for a small number of VSRs.

20.3.46 *Mitigation* – Mitigation measures are outlined in Part A and are shown in *Figure 20.8*.

Landfill Gas

20.3.47 The WLES is within the 250m consultation zone of the existing WENT Landfill and so a Landfill Gas Hazard Assessment would be required during the EIA stage. There are no sensitive receivers within this consultation zone and therefore there are no potential off-site LFG hazards.

20.3.48 It should be noted, however, that two geological fault lines run from the existing WENT Landfill, through the WLES and terminate below Black Point Power Station and, as such, may provide a natural pathway for LFG migration.

20.3.49 Although the WLES would generate significant amounts of LFG during the operation and aftercare phases, it has been assumed that the WLES would be designed as a containment landfill with an efficient LFG collection system that would eliminate off-site migration.

20.3.50 Given the remote location of the site and the lack of any sizeable population nearby, the direct off-site use of LFG as an energy source, e.g., exporting via pipeline to be used as a substitute for “towngas” or LPG in surrounding communities, is not considered practical.

20.4 Environmental Protection Measures to be Incorporated into Design and Further Environmental Implications

20.4.1 Environmental design measures have been identified in Section 3.8 (Part A) and generic approaches to mitigating impacts on different environmental parameters are outlined in Section 5 (Part A). Specific environmental mitigation requirements for the WLES are outlined below but are subject to the findings of the EIA:

Air Quality

20.4.2 It is unlikely that any construction, operation or aftercare activities would have a significant impact on ASRs, and so no air quality mitigation measures are recommended at this stage, other than good site practice.

Noise

20.4.3 Noise generated by the construction of the WLES is not expected to cause a significant increase to that generated by the operation of the existing WENT Landfill. There are few NSRs within 300m of the site.

20.4.4 During construction, the topography of the site provides natural acoustic shielding, nevertheless, good site practice is recommended. This would include using only powered mechanical equipment with built-in acoustic shielding and not using percussive piling. Where necessary, temporary noise barriers and/or earth bunds could be constructed.

20.4.5 During operation, it is likely that the most significant noise source would be from landfill-related vehicular traffic on the internal haul roads, the access road and on Nim Wan Road. Minor sources would be from on-site plant such as leachate treatment works, pumps, generators and the flare. To mitigate the most significant sources, the location of fixed plant should be carefully reviewed and permanent noise barriers could possibly be placed alongside roads where necessary.

Water Quality

WENT Leachate Management

20.4.6 The leachate treatment facility at the WENT Landfill originally covered approximately 1ha. However, this area has recently been extended by the construction of additional storage lagoons of approximately 2ha in area.

20.4.7 The estimated mean daily leachate production rate for the WENT B Landfill Extension is approximately 500cum/day. During the wet season, the peak monthly leachate generation is calculated at approximately 36,000cum, equivalent to 1,200cum/day averaged over the month. It is assumed that leachate treatment would be similar to that at the existing WENT Landfill, namely treatment followed by pumping to Lung Kwu Sheung Tan and discharge into the North West New Territories Trunk Sewer and outfall into marine waters at Urmston Road offshore from Castle Peak.

20.4.8 If the existing leachate treatment facilities were used for WENT B Landfill Extension, there would be a requirement to construct an additional lagoon to replace the one currently used, which lies within the perimeter of the existing WENT Landfill. As with the existing WENT Landfill, this lagoon could be situated within the WENT B Landfill Extension perimeter, in an area where filling would not take place until late in the life of the landfill.

- 20.4.9 If completely separate leachate treatment facilities were constructed, the most feasible site for these would be on the CLP lagoon area. The WENT B extension extends onto the CLP ash lagoons, but leaves an area of approximately 20ha free to accommodate possible bulk waste reduction facilities currently in the planning stages. The area of these facilities is not currently known, but it is considered that the 20ha area allocated is likely to be more than adequate for the likely scale of such facilities. It is therefore likely that a space of up to 4ha could be made available on the CLP lagoons for a leachate treatment facility. Alternatively, the perimeter of the WENT B Landfill Extension could be adjusted to allow sufficient extra space on the CLP lagoons for leachate treatment facilities.
- 20.4.10 Construction of the WENT B Landfill Extension would entail the diversion of the existing Nim Wan Road and the existing leachate pumping main, although this may occur some considerable time after the initial phases of the WENT B Landfill Extension have become operational. When diversion of the road does occur, it would be feasible to include a rising main of suitable capacity along the new road alignment to a suitable discharge point.
- 20.4.11 The existing WENT Landfill pumps treated leachate south, along the alignment of Nim Wan Road, to a pumping station from where it is pumped out to sea via a long sea outfall. There are currently 4 pumps (2 of which are stand-by pumps). With two pumps working, the overall pumping capacity is 140 litre/s at 110m head, equivalent to a capacity of approximately 8,000cum/day over a 16-hour operating cycle. The maximum permitted discharge rate is 1,800cum/day. Typical mean pumping rates for the period August 2000 to March 2001 were in the range 700 to 1,600cum/day. The existing pumps are therefore capable of dealing with the quantity of leachate that would be produced by both the existing WENT Landfill and the WENT Landfill Extensions.
- 20.4.12 The existing pipeline from the WENT Landfill to Lung Kwu Sheung Tan is planned for replacement in 2003. The replacement pipeline would be pressure rated at PN20 in the pumping main section. The existing landfill contractor has carried out a surge analyses for this pipeline with an assumed velocity of 193L/s, and has concluded that the maximum pressures are well below the 20bar rating. A flow rate of 193L/s over a twelve-hour period is equivalent to over 8,000cum/day (the current consented limit is 1,800cum/day). This suggests that the pipeline is capable of dealing with both the existing leachate from the WENT Landfill and a similar additional volume from the WLES. More detailed analyses would be required at a later stage to confirm these preliminary calculations.
- 20.4.13 Leachate from the existing WENT Landfill is subject to pretreatment (consisting of ammonia stripping and SBR treatment), prior to discharge via the NWNT long sea outfall to Urmston Road. The discharge point lies within the North Western Water Control Zone rather than Deep Bay, and hence impacts on the sensitive Deep Bay area are expected to be minimised. The quality of treated leachate that is should be in accordance with the WPCO Technical Memorandum. The upper concentration limits for discharges to Coastal Waters of the North Western Water Control Zone is 50mg/L total nitrogen, and 300mg/L COD, for discharges of between 1,000 and 1,500cum/day.
- 20.4.14 The WENT A Landfill Extension occupies a valley to the west of the existing WENT Landfill, and the toe bund of the extension terminates directly to the south of the existing leachate treatment facilities. Given that the overall capacity of the proposed WENT A Landfill Extension is approximately 6Mcum (compared to the total capacity of the existing WENT Landfill of approximately 55Mcum), the provision of separate leachate treatment facilities is likely to be relatively costly over the relatively short operating period. If however this provision was deemed essential, there is considerable flat land for development available on the site of the CLP ash lagoons, adjacent to WENT A Landfill Extension.

WENT Sewerage

- 20.4.15 The existing WENT Landfill and the WLES fall within the Deep Bay Catchment Area. Since the pollution loading of the Deep Bay and its catchment areas have well exceeded its assimilative capacity, any new facilities or development have to demonstrate that they do not impose an additional pollution loading onto Deep Bay.

- 20.4.16 In the vicinity of the existing landfill and the extension site, there is no sewage infrastructure development. Therefore all new developments are required to provide on-site sewage treatment facilities.
- 20.4.17 The amounts of sewage generated will be very small in comparison with quantities of leachate. It is proposed that sewage from the WLES would be disposed of by being fed into the SBR treatment facilities of the leachate treatment plant, and then disposed of to the outfall in Urmston Road together with the treated leachate. The net increase in sewage arising is expected to be minimal in comparison with daily leachate generation, and is not expected to give rise to a measurable increase in pollutant loading.

WENT Surface Water Drainage

- 20.4.18 During construction of the landfill bowl for the WLES, surface water drainage would be shed to the northern perimeter bund via drains cut into the perimeter haul roads to the west and utilising the existing WENT Landfill perimeter drainage to the east. The gradients of these drains would be 1(V) on 4(H); therefore intermediate and final flow attenuation measures would be required.
- 20.4.19 Following restoration, storm water runoff would flow from the landfill surface and be collected in perimeter drainage. The perimeter drainage would in turn discharge in the west into the main drainage line along the proposed Nim Wan Road diversion; and in the east into the drainage channels flowing through the existing WENT Landfill. To prevent ponding two areas require infilling along the original Nim Wan Road cutting to the west and within the valley situated at the uppermost levels to the east. A minor cut is required to allow flow from this valley to the east.
- 20.4.20 All water that has passed through areas containing waste should be classed as leachate, and will therefore be treated and discharged as described above. Storm water run-off generated during construction and operation of the WLES is not classed as leachate, but may contain elevated concentrations of suspended solids, as well as oils and 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. Standards for discharge into coastal waters of Deep Bay are 25-50mg/L of suspended solids and 10-20mg/L of oil and grease, depending on the volume of water discharged.
- 20.4.21 It should be noted that many of the existing slopes in the vicinity of the WLES are unvegetated and heavily eroded, and may therefore give rise to considerable concentrations of suspended solids in run-off water under current conditions. Following appropriate treatment, it is envisaged that the concentrations of contaminants in stormwater would be sufficiently low to have no significant impact upon Deep Bay, and would be similar in quality to the existing run-off from the roads and partially vegetated slopes under current conditions.

Waste Management

- 20.4.22 No specific waste management mitigation measures are recommended at this stage, other than good site practice as described in Part A (Section 5).

Ecology

- 20.4.23 As vegetation clearance would be necessary for development of the WLES, revegetation works should be undertaken at suitable locations and using suitable native species. The exact location of revegetation activities and the species to be used shall be determined at the detailed EIA Study stage of the project after detailed vegetation survey and habitat mapping has been conducted. The revegetation works should adopt a "landscape ecology" approach in that planting proposals should be co-developed by competent landscape architect with support from a botanist / vegetation ecologist.

Fisheries

20.4.24 As the site totally land based, there will be no impacts to marine fisheries. Furthermore, there is no (freshwater) fish-farming in the area that would be disturbed by the WLES.

Cultural Heritage

20.4.25 Opportunities to revise the boundary of the WLES to avoid the TTAS were investigated, but are not considered likely to be practicable. A number of options to minimise the impacts on the TTAS, have been considered these are discussed and described in Appendix II and include:

- *Preservation In situ by Burial Beneath the Landfill:* This approach leaves the affected relics where they are, but assumes they could be exhumed later if desired. However this option is constrained due the fact that the relics are just below ground-level and are vulnerable to damage from construction of the landfill. Any later exhumation, would also damage the integrity of the landfill, and could result in uncontrolled release of leachate through the base liner.
- *Preservation by Removal:* This approach includes preparation of an archaeological record of the site prior to commencement of the landfill construction. The end result of the programme would be publications that reflect the significance of the data collected, and the creation of a display, either at an existing museum, or at a dedicated facility / visitor centre. This option is the most feasible and practicable approach and has the advantage that it would allow the development of the WLES to continue and at the same time the archaeological relics and findings from the programme could be displayed at a suitable location within the HKSAR as an educational facility that would benefit the community. However, it is also the least preferred as it would result in the loss of some relics as well as a portion of the TTAS for future investigations.

20.4.26 As part of an EIA, a suitable plan for rescue excavation should be drawn up for approval by AMO. All excavation works should be completed (to the satisfaction of AMO) prior to commencement of any construction works. All artefacts should be recorded and photographed during excavation. The arrangements for ensuring the long-term management of the archaeological features is subject to agreement between the project proponent and EPD. However, all artefacts should be displayed in a location and manner which promotes community understanding and knowledge of Hong Kong's archaeology and cultural heritage.

20.4.27 The study concluded by Field Archaeology Consultants noted that as the two archaeological surveys in Nim Wan area were quite conclusive, no further archaeological survey is considered necessary within the study area covered by those surveys.

Landscape & Visual

20.4.28 It is envisioned that the restored site would blend in with the restoration of the original WENT 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.

20.5 Summary

20.5.1 A summary of the SEA for the WLES is provided in *Tables 20.1 and 20.2*:

Table 20.1: WENT Landfill Extension SEA

Impacts		Score	Commentary
Air Quality Assessment			
1	Distance to areas of air sensitive land use	○	The WLES is situated between the existing WENT Landfill and Black Point Power Station. Black Point Power Station is considered as an ASR and it is within 500m from this site. A temple near Tsang Tsui is another ASR. Other ASRs located outside 500m from the site and the associated new access road include the village of Ha Pak Nai which is situated over 1km to the north east, Pak Long and Nam Long which are over 1.8km to the south.
2	Presence of topographic features which could decrease or exacerbate impacts	○	Major Urban areas such as Tuen Mun and Yuen Long are separated from the WLES by hills, which would assist in minimising air quality impacts. The fact that the WLES is within the Deep Bay air shed may compound impacts upon Ha Pak Nai (1km to the north east) and Pak Long and Nam Long (over 1.8km to the south), however their distance from the site would mean impacts are not significant. It is unlikely that dust or odours would accumulate around the WLES.
3	Occurrence of meteorological conditions which could exacerbate impacts	○	Prevailing winds are from the south-west. The predominant wind direction would blow towards Shenzhen. However the remoteness of ASRs is such that this criterion is not significant.
4	Cumulative impacts of relevant emissions (TSP (construction), Nox, CO, SO ₂ – LFG Flare) taking into account ambient conditions	-	Relevant emissions are present within 5km. Sources of emissions in the vicinity are the existing WENT Landfill, Black Point Power Station and proposed waste management facilities (eg. WEF in Ha Pak Nai) that are currently in the planning stage. There is little road traffic in the area, and so emissions from traffic are likely to be low.
5	Total Emissions of Air Pollutants from the territory-wide waste transportation between the RTSS and the site	-	The site can utilise both road and marine access.
6	Overall impact	-	Overall it is considered that the WLES would have a minimal / low air quality impact on surrounding ASRs due to its remote siting. Levels of TSP, NO _x , CO, SO ₂ etc. arising from the landfill are unlikely to exceed AQOs at surrounding ASRs. With good site practice it is highly unlikely that emissions from the WLES would cause any air quality exceedences during construction or operation, although cumulative impacts need to be carefully considered should this option progress to the Detailed Stage. Therefore a 'Negative – Low' impact overall.

Impacts	Score	Commentary
Noise Assessment		
1	Distance to areas of noise sensitive land use	○ The WLES is situated between the existing WENT Landfill and Black Point Power Station. There are no villages or major urban areas within 300m. The village of Ha Pak Nai is situated over 1km to the north east. Pak Long and Nam Long are over 1.8km to the south.
2	Topographic features (only applicable if there are NSRs within 300m)	○ As the WLES is separated from the major urban areas (Tuen Mun) by hills, noise impacts upon them would be negligible. Ha Pak Nai is more exposed, however, it would be separated from the WLES by the existing landfill which would prevent line of sight. Impacts would thus be within acceptable levels.
3	Cumulative impacts of developments within 300m	○ There are no known developments (existing or planned) within 300m of the site. This site is remote from NSRs and there are no surrounding developments which could cause cumulative impacts.
4	Overall Impact	○ Overall it is considered that the WLES will have minimal noise impacts on surrounding NSRs due to its remote siting. Therefore a ' Neutral ' impact overall.

Impacts		Score	Commentary
Water Quality Assessment			
1	Watercourse diversion	○	No watercourses diversions are likely to be necessary during the works, although a small valley would be lost. Thus there are no significant watercourse issues although drainage issues would need to be addressed.
2	Potential for sediment contaminant release	○	Part of the WENT B Landfill Extension would be constructed over the PFA Lagoons situated north-east of Black Point Power Station. Whilst some contamination may be present, it should be relatively straight forward to mitigate impacts with sensitive environmental engineering. A phased contaminated land assessment should be undertaken during subsequent, more detailed studies.
3	Potential impacts on WSRs (including increase or exceedance of WQOs)	-	The site is adjacent to the Deep Bay WCZ which has a zero discharge policy due to its ecological importance. Therefore no discharges can be made to Deep Bay that would adversely affect water quality or WSRs.
4	Potential impacts on groundwater	○	Groundwater may be present as perched water tables above rockhead and in fissures within the underlying rock mass. However, within the vicinity of the site it is believed that, in common with most of Hong Kong, groundwater is not utilised as a resource. Impacts on background groundwater quality would be minimised by design of a suitable impermeable liner for the landfill, that would prevent discharge of significant quantities of contaminants into groundwater beneath the site.
5	Potential cumulative impacts (potential for concurrent projects to exacerbate preceding impacts)	-	There are a number of planned projects adjacent to the WLES and each of these would likely discharge effluent, to the detriment of the receiving waters.
6	Overall impact	○	The site is adjacent to Deep Bay and whilst there is potential for runoff to enter Deep Bay, it is considered that the site and technology are sufficiently well known to be able to control impacts to acceptable levels. Knowledge gained from the construction and operation of the existing WENT Landfill would be invaluable in planning for drainage and leachate management for the proposed extensions. Therefore a 'Neutral' impact overall.
Waste Management Assessment			
1	Balance of materials (surplus / deficit of public fill needed for landfill development)	○	The WLES has been designed to have a balance of cut and fill.
2	GHG emissions from mode of transport for delivery of waste to the site from RTSS	-	The site has a marine frontage, and is close to the marine reception facilities at existing WENT landfill. Waste transportation would be primarily by sea and road.
3	Overall impact	○ / -	With a material balance and waste transportation by sea and road, overall the strategic waste issues associated with the WLES are considered to be 'Neutral / Negative-Low' .

Impacts		Score	Commentary
Ecological Assessment			
1	Potential for secondary environmental impacts on "Areas of Absolute Exclusion"	○	There are no protected areas within 500m of the WLES. The nearest Protected Areas are the Sha Chau and Lung Kwu Chau Marine Park (over 4km to the south west) and an SSSI at Sheung Pak Nai (3.5km to the north east).
2	Affects an important habitat	-	The majority of this site is grassland / man made lagoons of low or no ecological value. However, there are a few small areas of mixed shrub-land and approximately 4,000m ² of immature native woodland that are of conservation value. Tsang Kok stream would also be lost.
3	Affects a species of conservation importance	-	The EIA Report for the existing WENT Landfill refers to a population of the Pitcher Plant <i>Nepenthes mirabilis</i> that was found in the valley of the Tsang Kok stream, the site of WENT A Landfill Extension. Although the species is protected, it is reported as being locally abundant in Hong Kong. Further investigation would be required as part of the detailed EIA for the project.
4	Potential for cumulative ecological impacts on sites of recognised value	○ / -	This area is already disturbed by the existing landfill. However the potential for cumulative impacts also exists with planned projects such as WEF.
5	Overall impact	-	Although there are no Protected Areas within 500m, the WLES would adversely affect an important habitat and a species of conversation importance, albeit ones that are located elsewhere. Nevertheless, together with the likely cumulative impacts from proposed adjacent developments, the overall impact has been assessed as ' Negative – Low '.
Fisheries Assessment			
1	Potential for secondary environmental impacts on "Areas of Absolute Exclusion"	○	Land based site – no impact anticipated.
2	Affects an important mariculture/ fisheries resources (including spawning / nursery ground)	○	Land based site – no impact anticipated.
3	Potential for cumulative fisheries impacts on sites of recognised value	○	Land based site – no impact anticipated.
4	Overall impact	○	This is a land based site and so there will be no fisheries impacts, i.e., ' Neutral '.

Impacts	Score	Commentary
Cultural Heritage Assessment		
1	Important cultural (Declared, Deemed or Graded sites) / archaeological sites	-- The WENT B Landfill Extension would cover the existing boundary of the Tsang Tsui Archaeological Site (TTAS), a recorded item under the Antiquities and Monuments Office. Recent excavations in this area have revealed extensive remains of the late Neolithic period (c 2500-1500 BC). There is also a large grave of the Tang Clan, dating to the late Qing period (c. 100 years old). There are no other declared, deemed or graded sites in the vicinity.
2	Potential for archaeological value	- Surveys have revealed that TTAS has a high cultural heritage/ archaeological value.
3	Potential for cumulative heritage Impacts on sites of recognised value	○ There are no known developments in the vicinity that are expected to impact on TTAS.
4	Overall impact	-- Construction of WENT B Landfill Extension could lead to the loss of an important archaeological site, albeit one with no above-ground features of cultural or historic significance. It would also lead to the loss of a large Tang Clan grave. Therefore, the overall impact has been assessed as ' Negative – High '.

Impacts	Score	Commentary
<i>Landscape and Visual Impact Assessment</i>		
1	Implications for landscape planning and designations	- Under the Territorial Development Strategy Review (TDSR) 1995 Landscape Strategy, the northern part of the site is zoned "Development Area High Landscape Value", areas of "suburban character with areas of scenic quality". The WLES will not be consistent with the landscape planning intention for the southern part of the area. Development is not inconsistent with the landscape planning intention for the northern part of the area.
2	Landscape resources	- Landscape resources on the site are not very sensitive, there is extensive disturbance already caused by industrial development and landslides, and the magnitude of the potential impacts is (relatively) limited.
3	Landscape character	- The effect of the WLES will be to introduce a new landscape feature into an upland area, which is already characterised by an existing landfill and by incongruous power station developments. This will result in impacts on landscape character.
4	Visual	- Only limited numbers of VSRs fall within the visual envelope of the WLES. The most significantly impacted VSRs include users of the Nim Wan Road, residents in Lung Kwu Sheung Tan and hikers on the Castle Peak peninsula. Generally however, visual impacts are offset by the indifferent visual quality of this area of the coast and in particular the presence of the existing WENT Landfill, Black Point Power Station and ash lagoons.
5	Overall Impact	- Overall, landscape and visual impacts will be ' Negative – Low ', for the following reasons: <ul style="list-style-type: none"> • The extension is not compatible with existing landscape planning intentions for the area. • Landscape resources on the site are not of particular sensitivity. • Landscape character is of medium/slight sensitivity, and is already degraded by the presence of the existing landfill, power station and ash lagoons. • VSRs are very few in number, often distant from the WLES and often transient. • The site will eventually be restored to simulate natural landforms and will be given landscape context by existing uplands.

Impacts		Score	Commentary
Landfill Gas Assessment			
1	Distance between the new / extended landfill and SRs	○	Other than buildings associated with the existing landfill, the nearest sensitive receivers are >250m away.
2	Number of receivers within 250m (i.e. Consultation Zone)	○	Other than buildings associated with the existing landfill, the nearest sensitive receivers are >250m away.
3	Man-made / natural pathways for LFG migration	-	There are utility routes in the vicinity of the site, consisting of the services leading to the existing landfill. However, the pathways via these services to sensitive receivers are long and indirect. There are not considered to be any significant geological pathways from the landfill.
4	Additional utilisation of LFG to reduce GHG emissions	○	There are no potential off-site users of LFG at this time.
5	Overall impact	○	There are no particular issue regarding LFG and so the impact is considered to be ' Neutral '.

Table 20.2: Summary of WENT Landfill Extension SEA

Overall Impacts	Score	Commentary
Overall Air Quality	-	Negative – Low
Overall Noise	○	Neutral
Overall Water Quality	○	Neutral
Overall Waste Management	○ / -	Neutral / Negative – Low
Overall Ecology	-	Negative – Low
Overall Fisheries	○	Neutral
Overall Cultural Heritage	--	Negative – High
Overall Landscape & Visual	-	Negative – Low
Overall Landfill Gas	○	Neutral

Table 20.3 Assessment of Significance of Visual Impacts for WENT Landfill Extension During Construction / Operation Phase
(Note: All impacts adverse unless otherwise noted)

VSR	Key Visually Sensitive Receiver (VSR)	Approx. Minimum Distance Between VSR and Source(s)	Nos. of Receivers (order of magnitude only)	Magnitude of Impact During Construction (Negligible, Small, Intermediate, Large)	Receptor Sensitivity (Low, Medium, High)	Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial)	Significance of Residual Impacts (Insubstantial, Slight, Moderate, Substantial)
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Residential Receivers

VR15	Lung Kwu Sheung Tan	1km	Very Few	Negligible	High	Insubstantial	Insubstantial
VR6	Ha Pak Nai	2km	Very Few	Small	High	Moderate	Slight
VR5	Sheung Pak Nai/ Ngau Hom Sha	5km approx	Very Few	Negligible	High	Insubstantial	Insubstantial
VR2	Lau Fau Shan Coast	6km-10km	Few	Negligible	High	Insubstantial	Insubstantial
VR7	Shenzhen (Shekou)	7km	Many	Negligible	High	Insubstantial	Insubstantial

Occupational Receivers

VR16	Workers in Black Point Power Station	400m	Very Few	Intermediate	Low	Slight to Moderate	Slight
VR17	Workers in fields around Lung Kwu Sheung Tan	1km	Very Few	Intermediate	Low	Slight to Moderate	Slight
VR18	Workers in fields around Ha Pak Nai	200m-3.5km	Very Few	Small	Low	Slight	Insubstantial
VR14	Vessels in Deep Bay	500m+	Very Few	Intermediate	Low	Moderate	Slight
VR19	Workers in Shenzhen (Shekou)	7km approx	Many	Negligible	Low	Insubstantial	Insubstantial

Recreational Receivers

VR10	Hikers on Castle Peak Peninsula	50m-5km	Very Few	Small	Medium	Moderate to Slight	Slight
VR20	Hikers on Lantau	16km	Very Few	Negligible	Medium	Insubstantial	Insubstantial

VSR	Key Visually Sensitive Receiver (VSR)	Approx. Minimum Distance Between VSR and Source(s)	Nos. of Receivers (order of magnitude only)	Magnitude of Impact During Construction (Negligible, Small, Intermediate, Large)	Receptor Sensitivity (Low, Medium, High)	Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial)	Significance of Residual Impacts (Insubstantial, Slight, Moderate, Substantial)
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Travelling Receivers

VR12	Nim Wan Road	50m	Few	Large	Medium	Substantial	Moderate
VR13	Users of Proposed Shenzhen Western Corridor	6km	Moderate	Small	Medium	Moderate to Slight	Slight
VR14	Vessels in Deep Bay	500m+	Very Few	Small	Medium	Moderate	Slight

Notes: Assessment of Impacts does not account for possible off-site visual mitigation, which may have the effect of reducing certain impacts further.
Locations of most important visual receivers shown in Figure 20.5.

Table 20.4 Assessment of Significance of Visual Impacts for WENT Landfill Extension During Afteruse Phase (Year 10 after Restoration)
(Note: All impacts adverse unless otherwise noted)

	Key Visually Sensitive Receiver (VSR)	Approx. Minimum Distance Between VSR and Source(s)	Nos. of Receivers (order of magnitude only)	Magnitude of Impact During Afteruse (Negligible, Small, Intermediate, Large)	Receptor Sensitivity (Low, Medium, High)	Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial)	Significance of Residual Impacts (Insubstantial, Slight, Moderate, Substantial)
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Residential Receivers

VR15	Lung Kwu Sheung Tan	1km	Very Few	Intermediate	High	Moderate	Slight
VR6	Ha Pak Nai	2km	Very Few	Small	High	Slight	Insubstantial
VR5	Sheung Pak Nai/ Ngau Hom Sha	5km approx	Very Few	Negligible	High	Insubstantial	Insubstantial
VR2	Lau Fau Shan Coast	6km-10km	Few	Negligible	High	Insubstantial	Insubstantial
VR7	Shenzhen (Shekou)	7km	Many	Negligible	High	Insubstantial	Insubstantial

Occupational Receivers

VR16	Workers in Black Point Power Station	400m	Very Few	Intermediate	Low	Slight to Moderate	Slight
VR17	Workers in fields around Lung Kwu Sheung Tan	1km	Very Few	Intermediate	Low	Slight to Moderate	Insubstantial
VR18	Workers in fields around Ha Pak Nai	200m-3.5km	Very Few	Small	Low	Insubstantial	Insubstantial
VR14	Vessels in Deep Bay	500m+	Very Few	Intermediate	Low	Slight	Slight
VR19	Workers in Shenzhen (Shekou)	7km approx	Many	Negligible	Low	Insubstantial	Insubstantial

Recreational Receivers

VR10	Hikers on Castle Peak Peninsula	50m-5km	Very Few	Small	Medium	Moderate to Slight	Slight
VR20	Hikers on Lantau	16km	Very Few	Negligible	Medium	Insubstantial	Insubstantial

	Key Visually Sensitive Receiver (VSR)	Approx. Minimum Distance Between VSR and Source(s)	Nos. of Receivers (order of magnitude only)	Magnitude of Impact During Afteruse (Negligible, Small, Intermediate, Large)	Receptor Sensitivity (Low, Medium, High)	Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial)	Significance of Residual Impacts (Insubstantial, Slight, Moderate, Substantial)
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Travelling Receivers

VR12	Nim Wan Road	50m	Few	Intermediate	Medium	Moderate	Slight
VR13	Users of Proposed Shenzhen Western Corridor	6km	Moderate	Small	Medium	Slight	Insubstantial
VR14	Vessels in Deep Bay	500m+	Very Few	Small	Medium	Slight	Slight

Notes: Assessment of Impacts does not account for possible off-site visual mitigation, which may have the effect of reducing certain impacts further.
Locations of most important visual receivers shown in Figure 20.5.