

11 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

11.1 Introduction

This section reports on the study to assess the potential landscape and visual impacts arising from construction and operation of any above ground structures and works areas associated with the Desalination Plant at Tseung Kwan O.

In accordance with the criteria as stated in Annexes 10 and 18 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM), the landscape and visual impact assessment (LVIA) for this Project includes:

1. a list of the relevant environmental legislation, standards and guidelines;
2. a definition of the scope and contents of the Study;
3. a review of the relevant planning and development control framework;
4. a landscape impact assessment section, including:
 - landscape impact assessment methodology;
 - a landscape baseline study providing a description of the baseline landscape resources (LRs) and landscape character areas (LCAs) within the Study Area;
 - identification of potential landscape impacts (these are similar to the potential visual impacts and hence all potential landscape and visual impacts are contained within one section);
 - prediction of the nature of landscape impacts and the potential magnitude of change they will cause as well as the potential significance of impacts before the implementation of mitigation measures;
 - recommendation of appropriate mitigation measures and associated implementation programmes; and
 - prediction of the significance of residual landscape impacts after the implementation of the suggested mitigation measures.
5. a visual impact assessment section, including:
 - visual impact assessment methodology;
 - a visual baseline study, providing details of visual elements surrounding the Project and key Visually Sensitive Receivers (VSRs);
 - prediction of the nature of visual impacts and the potential magnitude of change they will cause, as well as the potential significance of impacts before the implementation of mitigation measures;
 - recommendation of appropriate mitigation measures and associated implementation programmes; and
 - prediction of the significance of residual visual impacts after implementation of the suggested mitigation measures.

6. an assessment of the acceptability or otherwise of the predicted residual impacts, according to the five criteria set out in Annex 10 of the EIAO-TM, namely beneficial, acceptable, acceptable with mitigation measures, unacceptable or undetermined.

11.2 Environmental Legislation, Standards and Guidelines

The following legislation, standards and guidelines are applicable to this LVIA associated with the construction and operation of the Project:

- Environmental Impact Assessment Ordinance (Cap. 499. S16) and the Technical Memorandum on EIA Process (EIAO-TM), particularly Annexes 10 (Criteria for Evaluating Visual and Landscape Impact, and Impact on Sites of Cultural Heritage) and 18 (Guidelines for Landscape and Visual Impact Assessment);
- Environmental Impact Assessment Ordinance Guidance Note 8/2010 (Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance);
- Hong Kong Planning Standards and Guidelines (HKPSG) issued by the Planning Department, in particular Chapters 4, 10, 11 and Section 7 in Chapter 12 (As at August 2011);
- Land Administration Office Instruction (LAOI) Section D-12 Tree Preservation;
- Town Planning Ordinance (Cap. 131);
- Country Park Ordinance (Cap. 208);
- Protection of Endangered Species and Plants Ordinance (Cap. 586);
- ETWB TCW No. 2/2004 – Maintenance of Vegetation and Hard Landscape Features;
- ETWB TCW No. 29/2004 – Registration of Old and Valuable Trees, and Guidelines for their Preservation;
- ETWB TCW No. 5/2005 – Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works;
- DEVB TCW No. 3/2012 – Site Coverage of Greenery for Government Building Projects;
- DEVB TCW No. 10/2013 – Tree Preservation;
- Urban Design Guidelines for Hong Kong issued by the Planning Department (2003);
- Study on Landscape Value Mapping of Hong Kong ⁽¹⁾;
- GEO I /2011 – Technical Guidelines on Landscaping Treatment for Slopes;
- GEO I/2012 – Surface Protection and Appearance of Slope.

⁽¹⁾ PlanD. *Landscape Value Mapping of Hong Kong Final Report*. Available at: http://www.pland.gov.hk/pland_en/p_study/prog_s/landscape/landscape_final/index.html [Accessed July 2014]

11.3 Scope of the Study

The Study Area, as shown in aerial photographs in **Figure 11.1**, is located to the south of Southeast New Territories (SENT) Landfill and the Tseung Kwan O (TKO) Industrial Estate. It faces Clearwater Bay Country Park to the north-east, Joss House Bay to its east and the Tathong Channel to the west and south. The proposed site for desalination plant has an area of approximately 10 ha. There are two concurrent projects within the study area which should be assessed for cumulative impacts as listed below:

- South East New Territories (SENT) Landfill Extension
- Development in TKO Area 137

Note that a Fresh Water Main will connect the existing Tseung Kwan O Primary Fresh Water Service Reservoir and the proposed Desalination Plant. As outlined in Chapter 1, this will all be laid along an existing road and no trees will be felled. The road will be reconstructed after laying the main and no change in this Landscape is anticipated. The new Fresh Water Main will therefore be underground and not visible. Since no Landscape or Visual impact is anticipated as a result of these works, LVIA for laying for the Fresh Water Main are hence not addressed further in the assessment.

11.4 Review of Planning & Development Control Framework

This section provides an overview of the HKSAR Government's development intentions, statutory land-use and planning within the Study Area, specifically from landscape and visual standpoints. The existing Outline Zoning Plans (OZPs) are considered in relation to the Project Layout Plans, with the aim of assessing whether the Project can fit with the planning intention.

11.4.1 Outline Zoning Plan Designations

The statutory designations in the *Draft Tseung Kwan O Outline Zoning Plan (OZP) No. S/TKO/21* for the Study Area, are shown in **Figure 11.2**.

The Project site is located in Planning Area 137, which is the reclaimed land formed between 1998 and 2000. The site is on land zoned as "Other Specified Uses" annotated "Deep Waterfront Industry" "OU(DWI)" which is '*intended primarily for special industrial which require marine access, access to deep water berths or water frontage.*' It is considered that amendment to the OZP is required to rezone the site to an appropriate zone under *Town Planning Ordinance*.

Table 11.1 summarises the areas of existing zoning types designated in OZP No. S/TKO/21, within the Study Area and how they are affected by the Project.

Table 11.1 Project footprint on Draft Tseung Kwan O Outline Zoning Plan No. S/TKO/21

Zoning Type	Existing Area within Study Area (ha)	Area within Project Site Boundary (ha) (Approx % of area within Study Area)	Comments on key land use changes
"Open Space" (2) ("O(2)")	12.08	0 (0%)	No change required.
"Other Specified Uses" annotated "Deep Waterfront Industry" ("OU(DWI)")	59.84	10.08 (16.8%)	According to the draft Tseung Kwan O Outline Zoning Plan (OZP) S/TKO/21, "OU (DWI)" is intended for special industries which require marine access, access to deep water berths or water frontage. It is considered that amendment to the OZP is required to rezone the site to an appropriate zone under <i>Town Planning Ordinance</i> .

11.4.2 Country Park Designations Study

In addition the Project includes a study area for slope mitigation works where investigation regarding natural terrain hazards are being carried out and some areas of soil nailing and rock slope stabilization are proposed to address this hazard. These areas fall partly within the existing Clearwater Bay Country Park (CWBCP), as illustrated in **Figure 11.2**. The purpose of Country Parks is stated in *Section 4* of the *Country Parks Ordinance* (Cap.208) as being inter alia:

- To encourage recreation and tourism;
- To protect vegetation and wildlife;
- To preserve and maintain buildings and sites of historic or cultural significance; and,
- To provide facilities and services for the public enjoyment.

The planning intention for Country Parks is set out in the Para 3.3.2 of *Section 10* (Conservation) of the *Hong Kong Planning Standards and Guidelines* as being: "for the purposes of nature conservation, countryside recreation and nature education...criteria for determining whether or not a particular location is suitable for designation as a Country Park...include landscape quality, recreation potential..."

The necessary area to cover slope mitigation works for natural terrain hazards will principally consist of soil and rock stabilization works and provision of flexible debris barriers to protect the new desalination plant from landslide and boulder hazards from this slope.

With reference to **Figure 11.12**, approximately 0.49 ha of the lower ridge to the east of TKO Area 137 fall within this slope mitigation works area inside CWBCP. The slope mitigation works comprise of soil nailing, flexible barriers and rock slope stabilization and **Figure 11.13** illustrates some of the potential elements of these works. However the exact area necessary and location of specific elements of the slope mitigation works will be reviewed at a later date based on the finalized layout of the Project. The slope

mitigation works will be minimized to lessen any potential environmental impact to the Country Park and no significant change to the topography is anticipated as any works will look to avoid trees.

11.5 Methodology - Landscape Impact Assessment

According to the Study Brief (No. ESB-266/2013) requirement, the Study Area for the landscape impact assessment shall include all areas within 500 m from each Project site boundary as described in **Section 11.3** and indicated in the aerial photograph of the Study Area in **Figure 11.1**. Firstly a baseline study has been conducted within the Study Area, followed by an impact assessment, and each step is described below.

11.5.1 Baseline Study - Landscape

- a) Identification of the baseline landscape resources (LRs) and landscape character areas (LCAs) found within the 500 m Study Area has been achieved by site visits and desktop study of topographical maps, information databases and photographs. LR types are mapped based on their principal physical landscape and visual characteristics which link them together, rather than their habitat function. In mapping these resources, contiguous areas of the LR types are identified which may not always match ecological habitat maps. LCAs are broader categorizations than LRs, and each one encompasses a number of different LRs. In addition, identification of some tree species and dominant species within LRs and LCAs Study Area was undertaken. **Figure 11.3** and **Figure 11.5** show the baseline LRs and LCAs respectively.
- b) Assessment of the sensitivity of LRs and LCAs. This is influenced by a number of factors including the following:
 - Quality and maturity, condition and value of LRs/ LCAs, taking into account information from general quality, maturity and condition of other types of vegetation. (Ranked as high, medium or low)
 - Important / rarity of LRs/ LCAs (Ranked as high, medium or low)
 - Whether a LR/ LCA is considered to be of local, regional, national or global importance (Taken into account and included in the descriptive text only if relevant)
 - Whether there are any statutory or regulatory limitations / requirements relating to the LRs/ LCAs (Taken into account and included in the descriptive text only if relevant)
 - Ability of the LRs/ LCAs to accommodate change without compromising their essential nature. (Ranked high, medium or low)

The sensitivity of each LR and LCA is based on the values of all the above factors in totality and classified as follows:

- High:** Important landscape or landscape resources of particularly distinctive character of high importance, sensitive to relatively small changes.
- Medium:** Landscape or landscape resources of moderately valued landscape characteristics reasonably tolerant to change.

Low: Landscape or landscape resources of relatively unimportant landscape characteristics largely tolerant to change.

- c) Identify the geological features and volcanic rocks around Study Area.

11.5.2 Impact Assessment - Landscape

Landscape impacts have been assessed for the construction and operational phases of the Project as follows.

- a) **Identification of potential sources of landscape impacts.** There are various construction works elements and operational procedures that have the potential to generate landscape impacts.
- b) **Rating of the magnitude of change caused by landscape impacts.** The magnitude of change caused by the landscape impact is quantified according to a number of factors including the following:
- The physical extent of the impact. This is assessed using a number of factors, including: absolute area/length within the Project Site; relative area/length within the Project Site compared to the Study Area; and the current land use compared to the proposed land use i.e. taking into account some land, even though within the Project Site, may not be directly impacted. (Ranked as small, medium or large)
 - Compatibility of the Project and associated works with the existing and planned landscape in the vicinity. (Ranked as good, fair, or poor)
 - Duration of impacts i.e. whether it is temporary or permanent, under construction and operational phases.
 - Reversibility of change (ranked as reversible or irreversible).

The magnitude of landscape change on each LR/LCA is based on the values of all the above factors in totality and classified as follows:

Large: LRs or LCAs would incur a major change.

Intermediate: LRs or LCAs would incur moderate change.

Small: LRs or LCAs would incur slight or barely perceptible change.

Negligible: LRs or LCAs would incur no discernible change.

- c) **Prediction of landscape impact significance** before and after the implementation of the mitigation measures. By understanding the magnitude of change caused by the various impacts and the sensitivity of the various LRs/LCAs, it is possible to categorize impacts in a logical, well-reasoned and consistent fashion. **Table 11.2** shows the rationale for dividing the degree of significance into four thresholds, namely insignificant, slight, moderate, and substantial, depending on the combination of a negligible-small-intermediate-large magnitude of change and a low-medium-high degree of sensitivity of LR/LCA.

Table 11.2 Relationship between receptor sensitivity and magnitude of change in defining impact significance

		Receptor Sensitivity (e.g. LR/LCA or VSR)		
		Low	Medium	High
Magnitude of Change	Negligible	Insignificant	Insignificant	Insignificant
	Small	Slight	Slight/ Moderate	Moderate
	Intermediate	Slight/ Moderate	Moderate	Moderate/ Substantial
	Large	Moderate	Moderate/ Substantial	Substantial

The four thresholds for the degree of significance are explained below. **All impacts are assumed to be adverse in the text of the Report, unless specifically identified otherwise.**

Substantial: Adverse / beneficial impact where the proposed Project will cause significant deterioration or improvement in existing landscape quality

Moderate: Adverse / beneficial impact where the proposed Project will cause a noticeable deterioration or improvement in existing landscape quality

Slight: Adverse / beneficial impact where the proposed Project will cause barely perceptible deterioration or improvement in existing landscape quality

Insignificant: No discernible change in the existing landscape quality.

d) **Potential landscape mitigation measures** have been identified with a view to reducing landscape impacts to acceptable levels during design, construction and operation of the Project and associated works. The proposed mitigation measures are not only concerned with damage reduction but will also include consideration of preservation to avoid disturbance to LRs and LCAs and potential enhancement of existing landscape (and visual) quality. Mitigation measures may take the form of:

- Adopting alternative design or revising the basic engineering and / or architectural design, to prevent and / or minimize adverse impacts. Alternative alignment(s), design(s) and construction methods that avoid or reduce the identified landscape impacts have been evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts.
- Remedial measures such as colour and textural treatment of physical, engineering and building features; and
- Compensatory measures such as the implementation of landscape design measures (e.g. tree planting, creation of new open space etc.) to compensate for unavoidable adverse impacts and to attempt to generate potentially beneficial long-term impacts.

To ensure their effectiveness throughout the construction and operational phases of the Project and associated works, the relevant responsible parties for the on-going management and maintenance of the proposed mitigation measures have been identified. Approval-in-principle to the funding, implementation, management and maintenance of the proposed mitigation measures is being sought from the appropriate authorities, according to the principles in ETWB TCW No. 2/2004.

- e) **Prediction of Acceptability of Impacts.** An overall assessment of the acceptability, or otherwise, of the impacts in accordance with the five criteria set out in Annex 10 of the EIAO-TM is given, considering the guidelines in paragraph 3.11 of Environmental Impact Assessment Ordinance Guidance Note No. 8/2010.

11.6 Methodology - Visual Impact Assessment

According to the Study Brief (No. ESB-266/2013) requirement, the Study Area for the area for the visual impact assessment (VIA) shall be defined by the visual envelope of the Project. Within the defined visual envelope, key groups of visually sensitive receivers (VSRs) have been identified, with regard to views from ground level and elevated vantage points. The views of these VSRs are described and the sensitivity of each VSR evaluated. The overall visual character of the Project Site has also been broadly defined before considering the visual compatibility of the Project within its surroundings. An assessment of the visual impact of the Project on the identified VSRs has then been undertaken for both construction and operational phases of the Project. Further details on the visual impact methodology are found as follows.

11.6.1 Baseline Study - Visual

- a) **Identification of the Visual Envelope.** This is achieved by site visit and desk-top study of topographic maps and photographs, and GIS analysis, to determine potential visibility of the Project from various locations. GIS analysis inputs known data regarding the proposed built structures to model the area that can potentially see the developments. It should be noted that GIS analysis uses topographic data as a baseline, disregarding existing built forms and vegetation which reduce the actual visual envelope.
- b) **Zone of Visual Influence (ZVI).** In addition to the GIS analysis described above, the parameters of human vision must also be considered when determining visual impacts. If the visual envelope defines the limit of visibility, the Zone of Visual Influence (ZVI) is instead the extent to which the proposed Project would exert some visual impact on VSRs. The limit of the ZVI is defined as that point past which the Project would have an insignificant effect on the view.

As VSRs are located further away from the Project, the visual impact on the VSRs will decrease, until the Project is no longer visible. However, before the point of non-visibility is reached, the Project structures will have reduced in scale such that they no longer exert a significant visual impact and they are essentially indistinguishable within their surroundings. The ZVI is therefore an area that is

most likely to be visually impacted by the Project. **Figure 11.9** illustrates the ZVI for this Project.

- c) **Visual Sensitive Receivers (VSRs) & Vantage Points (VPs).** Having determined the assessment area for the VIA, VSRs have been identified within the ZVI of the Project, including those stated in the Brief.

Vantage Points or Viewpoints (VPs) were selected from key VSRs within the ZVI, from which to help illustrate the visual change that would be brought about by the proposed Project ensuring in combination they give a good overall representation of how the Project will appear to different VSRs. Photomontages have been prepared from the VPs to conceptually illustrate the visual impacts, both unmitigated and mitigated at Day 1 and mitigated at Year 10 of operation and supplement the visual changes described in the text. The photomontages are presented in **Figure 11.16a&b, Figure 11.17 a&b, Figure 11.18a&b, Figure 11.19a&b** and **Figure 11.20a&b**.

- d) **Assessment of the Sensitivity of VSRs.** Having selected the VSRs, their sensitivity is quantitatively and qualitatively assessed, influenced by a number of factors including the following:

- Type of VSR. VSRs are categorized according to whether the viewer is at home, at work or school, at play or leisure, or travelling. (Ranked by the major VSR types, as described below)

Residential VSRs – These VSRs are people living in the area and who view the proposed Project from their homes. They are considered the most sensitive VSRs due to the character of the view from their homes having a substantial effect on their perception of quality and acceptability of their home environment and general quality of life.

Occupational VSRs – These VSRs are people working or in education in the area, who view the proposed Project from their workplace or education centre. Visual amenity is in general not considered a top priority within the average workplace and these VSRs are considered to be relatively less sensitive than residential VSRs as their view will have a less important, although still material, effect on their perception of quality of life. The degree to which this applies to workers depends on whether their location is industrial, retail or commercial. The VSRs in industrial areas, such as factories, are generally considered to be the least sensitive, due to the relatively low quality of their existing view in an industrial area.

Recreational VSRs – These VSRs are people engaging in recreational activities such as hikers on established trails and footpaths, people participating in team sports at recreation grounds or at leisure. Sensitivity of these VSRs depends on duration of stay, nature of the activity and how enclosed the location is.

Travelling VSRs – These VSRs are people travelling on public roads and railways, both in public and private vehicles and on foot. They have varying sensitivity depending on the speed, nature and frequency of travel, but are

generally considered to be transitory to the area with less regard for the surrounding views and with low sensitivity.

- Number of individuals. (Ranked as very many, many, few or very few)
- Quality of existing view (Ranked as good, fair or poor)
- Availability of alternative views. (Ranked as yes or no)
- Degree of visibility. (Ranked as full, partial or glimpse)
- Duration of view. (Ranked as long, medium or short)
- Frequency of view. (Ranked as frequent, occasional or rare)

The sensitivity of each VSR is based on the values of all the above factors in totality and classified as follows:

High: The VSR is highly sensitive to any change in their viewing experience.

Medium: The VSR is moderately sensitive to any change in their viewing experience.

Low: The VSR is only slightly sensitive to any change in their viewing experience.

11.6.2 Impact Assessment - Visual

Visual impacts have been assessed for the construction and operational phases of the Project as follows.

- a) **Identification of potential sources of visual impacts.** There are various construction works elements and operational procedures that have the potential to generate landscape impacts.
- b) **Rating of the magnitude of visual change** which is quantified according to a number of factors including the following:
 - Distance between the closest source of impact and the VSR (Given in meters)
 - Scale of the development. This is assessed using a number of factors, including: absolute dimensions of new built structures visible to the VSR; relative dimensions of the new built structures compared to other structures visible to the VSRs in their existing view (Ranked as small, medium or large)
 - Potential blockage of view. (Ranked as full, partial or nil)
 - Duration of the impacts. (Ranked as temporary [short/medium term] or permanent)
 - Compatibility of the Project and associated works with the existing and planned landscape in the vicinity. (Ranked as good, fair or poor)
 - Reversibility of change (ranked as reversible or irreversible).

The magnitude of change caused by visual impacts on each VSR is based on the values of all the above factors in totality and classified as follows:

Large: VSRs would incur a major change in their viewing experience.

Intermediate: VSRs would incur a moderate change in their viewing experience.

Small: VSRs would incur a small change in their viewing experience.
Negligible: VSRs would incur no discernible change in their viewing experience.

- c) **Prediction of visual impact significance** before and after the implementation of the mitigation measures. By understanding the magnitude of change caused by the various impacts and the sensitivity of the various VSRs impacts are categorized into four thresholds, namely insignificant, slight, moderate, and substantial, as per **Table 11.2**, depending on the combination of a negligible-small-intermediate-large magnitude of change and a low-medium-high degree of sensitivity of VSRs.

The four thresholds for the degree of significance are explained below. **All impacts are assumed to be adverse in the text of the Report, unless specifically identified otherwise.**

Substantial: Adverse / beneficial impact where the proposed Project will cause significant deterioration or improvement in existing landscape quality

Moderate: Adverse / beneficial impact where the proposed Project will cause a noticeable deterioration or improvement in existing landscape quality

Slight: Adverse / beneficial impact where the proposed Project will cause barely perceptible deterioration or improvement in existing landscape quality

Insignificant: No discernible change in the existing landscape quality.

To help illustrate the effectiveness of the proposed visual mitigation measures, photomontages from selected Vantage Points (VPs) looking towards the Project have been prepared. The photomontages illustrate:

- Existing conditions;
- Day 1 of Operation Phase without Mitigation Measures;
- Day 1 of Operation Phase with Mitigation Measures; and
- Year 10 of Operation Phase with Mitigation Measures.

- d) **Potential visual mitigation measures** have been identified with a view to reducing impacts to acceptable levels during design, construction and operation of the Project. The proposed mitigation measures are not only concerned with damage reduction but will also include consideration of potential enhancement of existing visual (and landscape) quality. They may take the form of:

- Adopting alternative design or revising the basic engineering and / or architectural design, to prevent and / or minimize adverse impacts. Alternative alignment(s), design(s) and construction methods that avoid or reduce the identified impacts have been evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts.
- Remedial measures such as colour and textural treatment of physical, engineering and building features; and

- Compensatory measures such as the implementation of landscape design measures (e.g. tree planting, creation of new open space etc.) to compensate for unavoidable adverse impacts and to attempt to generate potentially beneficial long-term impacts.

To ensure their effectiveness throughout the construction and operational phases of the Project and associated works, the relevant responsible parties for the on-going management and maintenance of the proposed mitigation measures have been identified. Approval-in-principle to the funding, implementation, management and maintenance of the proposed mitigation measures will be sought from the appropriate authorities, according to the principles in *ETWB TCW No. 2/2004*.

- e) **Prediction of Acceptability of Impacts.** An overall assessment of the acceptability, or otherwise, of the impacts in accordance with the five criteria set out in *Annex 10* of the *EIAO-TM* (beneficial, acceptable, acceptable with mitigation measures, unacceptable and undetermined) is given, considering the guidelines in paragraph 3.11 of *Environmental Impact Assessment Ordinance Guidance Note No. 8/2010*.

11.7 Landscape Baseline Conditions

11.7.1 Landscape Resources (LRs)

The Landscape Resources (LRs) of the Assessment are described below and shown in **Figure 11.3**. **Figure 11.4** provides representative photographs of various LR within the Assessment Area.

Based on the broad brush tree survey, approximately 700 existing trees fall within the Mixed Woodland area (LR9) of the Study Area. **Figure 11.21a-j** illustrates the landscape conditions and vegetation where slope mitigation works will be carried out. There are no Old and Valuable trees (OVT) or Champion Trees in the Assessment Area, and from the surveys, no potential OVTs or trees with significant size were recorded either.

- **LR1-Shrubs and Trees of TKO Area 137:** This LR consists of around 11.15 ha of scattered grass, shrubs and weedy species including the weedy tree *Leucaena leucocephala*, weedy creeper *Mikania micrantha*, and grass *Pueraria phaseoloides*, occupying distinct patches on the vacant reclamation of Area 137 as well as at the foothills near where the slope meets the fill area. There are also occasional trees dominated by *Acacia confusa*, *Ficus microcarpa*, *Homalium chochinensis* and *Litsea glutinosa*. This LR, given the weedy nature of most of its vegetation, has a moderate ability to accommodate change and its sensitivity is "Low".
- **LR2- Shrubs and topography of Tit Cham Chau:** This LR consists of 2.47 ha of natural hillside with shrubs on the former island of Tit Cham Chau (now joined to the Clear Water Bay Peninsula by reclamation) such as *Melastoma sanguineum*, *Bridelia tomentosa* and *Rhodomyrtus tomentosa*. This is an isolated natural green hill amongst the low lying, highly modified fill area and has a low ability to accommodate change. The sensitivity of this LR is "High".

- **LR3- Rocky Shore:** This LR consists of rocky shore on the south of Tit Cham Chau as well as rocky shore south of the ridge east of the TKO Area 137. This LR covers an area of approximately 2.16 ha in total and contrasts with the artificial seawalls adjacent to it. This LR has low ability to accommodate change and its sensitivity is “High”.
- **LR4-Shrubs and topography of Kwun Tsai Island:** This LR consists of a very small area of about 0.11 ha of natural low hillside with shrubs on KwunTsai Island. This LR cannot easily accommodate change. It is a very small area and the sensitivity of this LR is “High”.
- **LR5- Sandy shore:** This LR consists of approximately 0.23 ha of sandy shore / beach near the southern end of the Project Site and further round along the coast towards the north of Joss House Bay. This LR is a one of the basic coastal element of Hong Kong and has low ability to accommodate change such that its sensitivity is “High”.
- **LR6- Grass, shrubs and trees east of TKO Area 137:** This LR consists of an area of about 39.24 ha of natural upper hillsides on the south-west tip of the Clear water Bay Peninsula. The hillside is covered with grasses (such as *Ischaemum aristatum*, *Arundinella setosa*, *Cymbopogon goeringii*, and *Lepidosperma chinense*) and the lower hillside is covered with a scattering of grass and common native shrub species (eg *Miscanthus floridulus*, *Rhaphiolepis indica*, *Rhodomyrtus tomentosa* and *Melastoma sanguineum*) as well as some trees including native *Litsea glutinosa*, *Macaranga tanarius*, *Mallotus paniculatus*, *Phoenix hanceana* and the weed species *Leucaena leucocephala*. This LR also has some small rocky outcrops and includes some protected herb and orchid species (including *Pachystoma pubescens*, *Habenaria linguella*, *Platycodon grandifloras*, *Pecteilis susannae*, *Nepenthes nirabilis* and *Lilium brownie*) as well as the protected climber *Marsdenia Lachnostoma*, as detailed in Section 9 – Ecology Chapter. This LR has low ability to accommodate change. The sensitivity of this LR is “High”.
- **LR7- Drainage Channel:** This LR consists of the man-made channels and ditches within the TKO Area 137 and at the base of the eastern hill that borders the Project Site. There is approximately 1.29 ha of this LR in total and it is highly modified with a high ability to accommodate change. The sensitivity of the LR is “Low”.
- **LR8- Seascape of Joss House Bay and Tathong Channel:** This LR comprises the sea in the Study Area, making up approximately 62.89 ha. The area of this LR in the Study Area is mainly outside the Tathong Channel and used for recreational activities. It has a medium ability to accommodate change and its sensitivity is considered to be “Medium”.
- **LR9- Mixed Woodland along lower hillside of Tin Hau Shan:** This LR consists of some trees lying on what appears to be re-graded lower hillsides and is small (1.17 ha) in size with an estimated 700 trees. Vegetation includes native tree species of which the following are commonly found: *Ficus hispida*, *Ficus microcarpa*, *Macaranga tanarius*, *Mallotus paniculatus*, as well as *Bauhinia blakeana*, *Homalium cochinchinensis*, *Phoenix hanceana*, *Schefflera heptaphylla* and *Zanthoxylum avicennae*. There are also some common exotic trees such as *Acacia confusa*, *Delonix regia* and *Ficus benjamina* as well as weedy vegetation including the tree *Leucaena leucocephala*, and creepers *Mikania micrantha*, and *Pueraria phaseoloides*. There are also some

shrubs in the area. The ability of this LR to accommodate change is lower due to the vegetation growing on it, but some of these are weedy species. The sensitivity of this LR is "Medium".

- **LR10- Site office area of SENT Landfill:** This LR represents the periphery of the SENT landfill offices and laboratories, covering approximately 0.16 ha within the Study Area. Soils in this area are fabricated, and not of great sensitivity. The LR can accommodate change and in addition, there is only a small area included in the Study Area. The sensitivity of this LR is "Low".

- **LR11 – Fill Area:** This LR is the existing fill bank at Fat Tong Chau, including seawall and pier, and has very limited vegetation outside of that found in LR1, mainly consisting of weedy vegetation including *Leucaena leucocephala*. This LR is approximately 59.67 ha in size, can readily accommodate change and its sensitivity is "Low".

11.7.2 Landscape Character Areas (LCAs)

The main existing Landscape Character Areas Resources (LCAs) within the Study Site are illustrated in **Figure 11.5** with representative photographs of each in **Figure 11.6a&b**. There are three LCAs within Study Area as described below and no Old and Valuable trees (OVT) or Champion Trees have been recorded in the Study Area.

- **LCA1 – Fat Tong O Reclamation:** This landscape comprises an area of completed and ongoing reclamation located at the south western tip of Clear Water Bay Peninsula, between Junk Bay and Joss House Bay. The landscape comprises a large, flat and lying area of reclamation on the south west tip of the Clearwater Bay peninsula, adjoining the Tathong Channel. To the north, it abuts the former island of Fat Tong Chau and to the south it adjoins Tit Cham Chau. The reclaimed shorelines are constructed from a straight alignment of armour stone seawall. The area is currently reclaimed but undeveloped and there is a constant flow of trucks of the area. There is little or no vegetation in the landscape, except for occasional patches of scrub. The result is an almost uniform landscape of huge scale elements which has a character that is expansive and visually incoherent and which has a "Low" sensitivity (see **Figure 11.6a**).

- **LCA2 – Clear Water Bay Peninsular Coastal Uplands:** This upland landscape forms the spine of the Clear Water Bay Peninsula. The rolling uploads of Clear Water Bay Peninsula comprise a long ridgeline above steep slopes running from Sheung Yeung Shan in the north to Ha Shan Tuk and Tin Ha Shan in the south. The uplands are dominated by High Junk Peak, an extremely steep and jagged peak rising to a height of 344mPD. The uplands fall to Clear Water Bay to the east and include the small rocky headlands at Ngam Ha Tong in the north and Tai Wong Kung in the South. In general, the coast comprises low cliffs and rocky foreshore, but also beaches such a Clear Water Bay Second Beach. East facing slopes tend to be more smooth and even than those to the west. The landscape is larger undeveloped. However, the Clear Water Bay Road runs along the east side of the ridge and there is a footpath along the ridge itself. A small road provides access to traditional finishing village houses and a temple at the southern headland at Tai Wong Kung. Elsewhere, a small sheltered bay lies on the north east coast of the headland at Po Toi O forming a traditional fishing harbor for the village of the same name. The village contains traditional house, seafood restaurants, a

temple and a small pier. There are numerous cut slopes along the Clear Water Bay road. To the south of the LCA, on the north shore of Joss House Bay, is the Tin Hau Temple at Tai Miu which one of the largest and best known Tin Hau temples in Hong Kong. Vegetation within the uplands comprises grassland and emergent scrub to west facing slopes and scrub woodland to east facing areas. The result is a simple rural landscape of large scale elements which has a character that is open and tranquil and which has a "High" sensitivity (see **Figure 11.6a**).

- **LCA3- Tathong Channel and Joss House Bay:** This landscape comprises the areas of inshore water between Hong Kong Island and Clearwater Bay Peninsula. The waters extend from Junk Bay and Victoria Harbour in the north to the tip of Cape D' Aguilar (Hong Kong Island) in the south. The landscape is fairly well contained by the steep hills of eastern Hong Kong Island and those of the Clearwater Bay Peninsula. To the south, the waters open out to the open sea. The landscape comprises primarily the waters themselves, as well as Ng Fan Chau, a small, steep rocky island which lies within Island Bay to the immediate south of the Shek O Headland. The island rises evenly from a low rocky coast to a rounded peak of 47mPD and its vegetation comprises mainly scrub. Kau Pei Chau is a small double island at the southern tip of the D'Aguilar Peninsula within Cape D' Aguilar Marine Reserve. The island rises gently from the water to a twin peak 45mPD and is covered by scrub vegetation. Generally, this is an almost uniform landscape of large scale elements, which has a character that is open and tranquil and which has a "High" sensitivity (see **Figure 11.6b**).

- **LCA4 - SENT Landfill and future extension:** This landscape lies on reclaimed land on the west coast of Clear Water Bay Peninsula, between the Clear Water Bay Peninsula central uplands and Tseung Kwan O Industrial Estate. The Northern parts of the SENT Landfill are still active while southern parts have been partly restored by soil capping and have been hydroseeded and planted with woodland whips and shrub species. The future extension part of the Landfill and the Landfill site office lied within the Project Assessment Area and located at the north of the Project Site. The future extension is reclamation land connected with LCA1 Fat Tong O Reclamation Land currently. The result is a complex landscape of large scale elements which has a character that is open and visually incoherent and which has a "Low" sensitivity (see **Figure 11.6b**).

11.7.3 Geology²

The Study Area lies largely on reclaimed 'fill' land, but is in the vicinity of the Southern Clear Water Bay Peninsula which is mainly underlain by volcanic rocks (mainly acid lavas and tuffs) of the Repulse Bay formation dating from the Mesozoic period.

On the eastern side of Tai Miu Wan a small quartz monzonite pluton³ surrounded by a chilled margin of quartz trachyte is exposed in coastal sections. Here, rounded monzonite corestones stand out in the weathered cliff exposures (**Figure 11.8**). The rock is essentially fine grained and pinkish grey, with abundant alkali feldspar crystals

² Strange, P.J., Shaw R., Addison R. (1990) *Hong Kong Geological Survey Memoir No. 4. Geology of Sai Kung and Clear Water Bay*. Geotechnical Control Office, CEDD

³ Pluton – a deep-seated intrusion of igneous rock, a body that made its way into pre-existing rocks in a melted form ([magma](#)) several kilometres underground, in the Earth's crust. If a pluton is exposed at the Earth's surface, that means its top has been removed by erosion.

which are often aligned to give it a characteristic texture (See **Figure 11.8**). Within this Group, the Che Kwu Shan Formation is the most extensively exposed formation in the area. The formation comprises mainly welded crystal-bearing fine ash vitric tuff and tuff breccia.

Running east west across the southern slopes of Tin Ha Shan is a quartz monzonite dyke that reaches 60 m in width and contains several long enclaves or screens of coarse-grained granite. In places, the dyke appears to bulge, as for example at the helicopter landing site above the Tin Hau Temple.

The coastline around Joss House Bay will not be changed, particularly to the north of the bay and south of Clear Water Bay Golf and Country Club will not be affected by the Project and therefore impacts to the geology of the area are predicted to be negligible.

11.8 Visual Baseline Conditions

The Project Site is located in a coastal area, bordered by the SENT landfill to its immediate north and ongoing development further north including the TKO industrial area and high rise residential blocks. To its east it is shielded by a prominent hillside covered by grass and shrub within Clearwater Bay Country Park that provides a green backdrop. The site itself however is currently one of the main fill sites in Hong Kong and has ongoing earthworks in progress. A large portion of the coastline around the Project Site is reclaimed shoreline constructed from a straight alignment of armour stone seawall.

Figure 11.9 shows the predicted Visual Envelope and Zone of Visual Influence of the Project and illustrates that around Clear Water Bay Peninsula and Tseung Kwan O, the area is relatively shielded by natural topography. To the north, the ZVI will extend as far as Black Hill (281mPD) as well as high ground around Devils Peak (221mPD). Taller buildings within Po Lam and northern parts of Tseung Kwan O (Metro City) will also fall within the Visual Envelope. Eastern parts of northern Tseung Kwan O (East Point City) will not fall within the Visual Envelope as these areas will be screened by intervening landforms and the restored SENT landfill. To the east, the Visual Envelope is almost wholly contained by the ridge of hills along the Clear Water Bay Peninsula but there are some direct views to the Project Site along some stretches of the High Junk Peak trail from Tai O Mun Road to the Peak (344mPD) and along the Tai O Mun Road itself leading to the Clearwater Bay Golf and Country Club area. The Project Site will be visible from the Tathong shipping channel and nearby waters and across the water eastern areas of Hong Kong Island will also be able to see the site although they are all at least 2 km away.

11.8.1 Visual Sensitive Receivers (VSRs)

The Project is likely to be visible to a number of different VSRs, not only those close to the Study Site in and around Tseung Kwan O (TKO) (e.g. LOHAS Park, TKO New Town, TKO Area 85 etc.), but also to certain VSRs across the Tathong Channel at viewpoints on Hong Kong Island, potentially including those at Siu Sai Wan, Heng Fa Chueng, and Shek O as well as VSRs on Tung Lung Chau. Vessels in the Tathong Channel will also command a view of the proposed development.

Thirty one (31) nos. of VSRs have been identified within the ZVI, as shown in **Figure 11.10** with a lack of residential VSRs close to the Project Site and general shielding of views by natural topography and vegetation. VSRs are generally described below together with their sensitivity.

Residential VSRs

Ten (10) residential VSRs have been identified, most of which are considered to have **high** sensitivity, although most have partial views of the Project due to the natural topography and vegetation shielding their views. This includes VSRs H1 Future Residents at Pak Shing Kok, H2 Residents of TKO and TKO New Town, H3 Residents of LOHAS Park, H4 Future Residents of TKO Area 85, H5 Residents in Island Resort, Siu Sai Wan, H6, Residents in the Chai Wan Area, H7, Residents in the Heung Fa Chuen Area, H8 Residents in the Shek O Village Area. Exceptions to residential VSRs with high sensitivity are:

- Residents/ Inmates and staff at Cape Collison Correctional Institute (H9) are generally not considered to be sensitive to changes in their view and therefore this VSR is considered to have **low** sensitivity; and
- Residents in Full View Garden Siu Sai Wan (H10). These flats are mainly hidden behind the hill (Pottinger Peak) at Cape Collison which shields views from most flats towards the Project Site (See **Figure 11.11**) such that at best they could only get 'glimpse' views from some of the topmost flats but the majority of residents cannot see the Project. Therefore this residential VSR is considered to include very few to have **medium** sensitivity,

Occupational VSRS

Three (3) occupational VSRs have been identified, which are generally considered to have **low** sensitivity, with one exception as described below.

- **VSR 01- Workers in Existing TKO Industrial Estate:** This VSR group is approximately 950 m from the Project Site at its closest point with fair quality existing views. Due to shielding by other buildings as well as some of the natural topography views to the Project Site are partial and this VSR is considered to have **low** sensitivity.
- **VSR 02- Future Workers in TKO Area 137:** Although occupational VSRs are generally of lower sensitivity, given this VSR group will be right next to the Project with direct views, it is considered to have **medium** sensitivity.
- **VSR 03- Workers in Chai Wan Dock Area:** This VSR group is across the Tathong Channel, over 2,800 m away with only partial views of the Project Site and good alternative views. It is considered to have **low** sensitivity.

Recreational VSRs

Sixteen (16) recreational VSRs have been identified. Four (4) are considered to have **medium** sensitivity (**VSRS R3 Users of Clear Water Bay Country Park; R4 Hikers on High Junk Peak Trail and nearby; R5 Hikers/ Campers on Tung Long Chau and R9 Hikers in the Cape Collinson Area**), and the rest to have low sensitivity.

Further explanation is given for the medium sensitivity ratings for **R4 Hikers on High Junk Peak Trail**. Much of the High Junk peak trail falls outside the ZVI, with natural topography blocking views to the Project Site (see **Figure 11.10**). In addition vegetation along the sides of the path also shield views out and towards the Project Site (see **Figure 11.11**). Note the walking trail on the knoll immediately to the east of the Project Site is a 'difficult/ indistinct or seasonally overgrown' footpath and only very few people are considered to use it, with the majority of this VSR being represented by High Junk Trail users and walkers in the Clear Water Bay Country Park. Nevertheless a photomontage has been developed from a VP on this pathway (VP4) to indicate a worst case scenario for these VSRs and given an overall impression how the Project would appear from this angle.

Recreational VSRs with **low** sensitivity number twelve (12) and include **R1 Future users of the Restored SENT Landfill, R2 Users of Clear Water Bay Golf and Country Club, R6 Visitors to Shek O, R7 Users of Shek O Country Park including hikers on Dragon's Back, R8 Hikers around Mount Parker, R10 Visitors to Chai Wan Cemetery East and R11 Visitors to TKO Chinese Cemetery and Devil's Peak, R12 Hikers around Black Hill, R13 Users of Lei Yue Mun Park, R14 Future Users of the Restored TKO Landfill, R15 Users of Heng Fa Chuen Promenade and R16 Visitors to the Museum of Coastal Defence**. Most have alternative views and only have partial or glimpse views of the Project Site. (Most are 3 km or more from the Project Site)

Further explanation is given for the low sensitivity ratings for **R1 Future users of the Restored SENT Landfill, R2 Users of Clear Water Bay Golf and Country Club**. It is thought there will be relatively 'very few' future users of the Restored SENT Landfill (R1) and they will have only occasional, partial views to the Project (**Figure 11.11**) even at their closest point (650 m). For Users of Clear Water Bay Golf and Country Club (R2), the main facilities of the clubhouse do not face the Project Site. In addition there is a lot of planting within the golf course meaning that views from the greens are mainly shielded in the direction of the Project Site (**Figure 11.11**). Therefore the Project Site can only be glimpsed and the sensitivity is **low**.

Travelling VSRs

Two (2) travelling VSRs have been identified as described below.

- **VSR T1- Travellers on the Future Cross Bay Link**. This VSR group has views across the Tathong Channel to the Project Site but the duration is short and they will be at least 2,700 m from the Project Site. Views are also likely to be only glimpse given other structures, topography and vegetation shielding it and therefore the VSR has **low** sensitivity.
- **VSR T2- Vessels in Tathong Channel & Joss House Bay**. This VSR group can in theory come right next to the Project Site and get a full view. Although the majority of vessels will be in the Tathong shipping channel with the Project Site less visible to them, the VSR is considered to have **medium** sensitivity as a worst case scenario.

11.9 Identification of Potential Sources of Landscape and Visual Impacts

The Project, as described in detail in Section 3, will have various potential landscape and visual impacts during construction and operation, as described below.

11.9.1 Construction Phase

During the construction phase of the Project, potential impacts could result from the following:

- Site clearance for the civil works, including Removal of vegetation and tree felling where necessary (e.g. of weedy species);
- Open-cut excavation and re-provision of surfaces within the reclamation area;
- Clearance for temporary access to construction site;
- Landscaping works;
- Presence and operation of construction vehicles and machinery;
- Temporary works area;
- Stockpiling areas;
- Construction of the new facilities;
- Trenchless technologies for construction of the proposed submarine outfall; and
- Seabed dredging for the installation of the intake structures and outfall diffuser.

In addition, some slope mitigation works are proposed. Although the extent of such works will be decided based on the finalized layout at later stage, currently these are discussed fully in **Section 2.3.1** and include:

- Passive/ flexible debris barriers typically 4-5 m high, some soil nailing at the lower section of the natural slope and stabilization of boulders and rocks using local concrete infills dowelling. **Figure 11.12** helps to indicate the potential location of these works and **Figure 11.13** helps to illustrate the scheme of slope works.

11.9.2 Operation Phase

During the operation phase of the Project, potential impacts could result from the following:

- Operation of new buildings, machinery and plant and new access road; and
- Landscaping works.

11.10 Landscape Impact Assessment

Of the eleven (11) LR s and four (4) LCAs within the Assessment Area, three (3) LR s and three (3) LCAs are affected by the main proposed development while an additional two (2) LR s fall within the slope mitigation works area. **Figure 11.14** and **11.15** help to illustrate the areas of LR s and LCAs affected and these impacts are described below

and summarised in **Table 11.3**. All magnitudes of change are adverse unless stated otherwise.

11.10.1 Magnitudes of Landscape Change

The majority of the Project Site (approximate 5.39 ha) falls on existing Fill Area (LR11). The Project is fairly compatible with this LR and although the magnitude of change is considered to be intermediate given the medium scale, it is partly beneficial as the Plant will enhance this currently barren earthworks area. The study area for slope mitigation works covered an area of just under 6 ha on the western slope of the hill adjacent to the Project Site in Clear Water Bay Country Park. Although the majority of the Country Park will not be affected by the Project, the lower portion of the natural slope within the Country Park will require soil nailing works and rock slope stabilization as well as the erection of flexible barriers to protect the Project Site from falling debris. **Figure 11.12** indicates the location of these works and the currently proposed soil nailing and rock slope stabilization areas in total cover approximately 0.49 ha.

Two LRs at the base of the hillside are also minimally affected by the Project Site. These include approximately 0.69 ha (0.38 ha due to Desalination Plant site and 0.31 ha due to the slope mitigation works) of Grass, shrubs and trees east of TKO Area 137 (LR6) and 0.79 ha (0.61 ha due to Desalination Plant site and 0.18 ha due to the slope mitigation works) of Mixed Woodland along lower hillside of Tin Ha Shan (LR9). The civil works for the Project Site here will require the loss/ removal of natural lower hillsides, which are covered predominately with grass and also with some scattered shrubs and possibly some trees. In addition the slope mitigation works will affect these LRs as described below but the total areas affected are small and the magnitude of change to these LRs will be "Small".

In addition, the anticipated installation of the seawater intake and submarine outfall will affect the seascape of Joss House Bay and Tathong Channel (LR8). These pipes are approximately 200-250 m and 300-350 m in length and will be constructed with trenchless technologies with some localized dredging required for their construction and rock fill materials used to provide support and protection along the seabed. During construction therefore the change to this LR will be small and at operation when they are under water and no longer visible, the change will be negligible.

Similar to impacts on LRs, the main Project Site will principally affect the Fat Tong O Reclamation (LCA1) (approximately 10.30 ha) with a small peripheral area of Clear Water Bay Peninsular Coastal Upland (LCA2) (approximately 0.51 ha, in which 0.10 ha due to Desalination Plant site and 0.41 ha due to the actual proposed area of soil nailing and rock slope stabilization) affected. The changes to these LCAs will be intermediate and small respectively. The seawater intake and submarine outfall will affect the Tathong Channel and Joss House Bay LCA3, with the magnitude of change being small and negligible during construction and operation respectively.

Overall impacts on Trees

Based on the broad brush tree survey, approximately 700 existing trees fall within the Mixed Woodland area (LR9) of the Study Area. Of these, approximately 320 trees are

located in the direct footprint of slope mitigation works area, where careful design will seek to work around them and avoid any tree felling. For the remaining 380 trees, 280 trees are either located outside the Project site or the slope mitigation works, whilst approximately 100 of trees would require felling for site formation of desalination plant. In addition, approximately 100 trees under the corner of some facilities and the perimeter road of the Project and occasional trees within the shrubs of TKO Area 137 (LR1) that will require felling. As a result, approximately 200 trees will require felling within the Project site of desalination plant. None of these trees are Registered Old and Valuable Trees or species of conservation interest. A detailed tree survey and removal application will be submitted in accordance with *DEVB TCW No. 10/2013 – Tree Preservation* separately, in which the precise number of trees to be retained, transplanted, felled and compensated will be determined and agreed with the relevant authorities. Trees of conservation importance, if any, are proposed to be transplanted where possible.

Table 11.3 Magnitude of Change of LRs and LCAs

LR/ LCA Code	Name	Approximate Area of LR/LCA in Study Area (ha)	Key Source of Impact	Area of LR/ LCA within the Project Site including Desalination Plant Site and anticipated Slope Mitigation Works Area (ha)	Physical extent of the impact (Small/ Medium/ Large)	Compatibility with Surrounding Landscape (Good /Fair /Poor)		Duration of Impact (Temporary, Permanent)		Reversibility of Change (Reversible/ Partly Reversible/ Irreversible)		Magnitude of Change (Large/ Intermediate/ Small/ Negligible)	
						Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
LR1	Shrubs and Trees of TKO Area 137	11.15	Whole Project Site	3.78	Medium	Poor	Poor	Permanent	Permanent	Irreversible	Irreversible	Intermediate	Intermediate
LR2	Shrub and topography of Tit Cham Chau	2.47	None	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible	Negligible
LR3	Rocky Shore	2.16	None	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible	Negligible
LR4	Shrub and topography of Kwun Tsai Island	0.11	None	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible	Negligible
LR5	Sandy shore	0.23	None	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible	Negligible
LR6	Grass, shrubs and trees east of TKO Area 137	39.24	Slope mitigation	0.69	Small	Fair	Fair	Permanent	Permanent	Irreversible	Irreversible	Small	Small
LR7	Drainage Channel	1.29	Eastern and Southern boundary of Project Site	0.18, 0.7km	Small	Poor	Poor	Permanent	Permanent	Irreversible	Irreversible	Small	Small
LR8	Seascape of Joss House Bay and Tathong Channel	62.89	Seawater intake & Submarine outfall	~550m of seawater intake and submarine outfall falls in LR8	n/a	Fair	Fair	Temporary	Permanent	Irreversible	Irreversible	Small	Negligible
LR9	Mixed Woodland along lower hillside of Tin Ha Shan	1.17	North east Project Site & Slope mitigation	0.79	Small	Fair	Fair	Permanent	Permanent	Irreversible	Irreversible	Small	Small
LR10	Site office area of SENT Landfill	0.16	None	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible	Negligible
LR11	Fill Area	59.67	Whole Project Site	5.39	Medium	Fair	Fair	Permanent	Permanent	Irreversible	Irreversible	Intermediate	Intermediate
LCA 1	Fat Tong O Reclamation	60.99	Whole Project Site	10.30	Medium	Good	Good	Permanent	Permanent	Irreversible	Irreversible	Intermediate	Intermediate
LCA 2	Clear Water Bay Peninsular Coastal Uplands	43.25	Slope mitigation	0.51	Small	Fair	Good	Permanent	Permanent	Irreversible	Irreversible	Small	Small
LCA 3	Tathong Channel and Joss House Bay	63.33	Seawater intake & Submarine outfall	~550m of seawater intake and submarine outfall falls in LCA3	n/a	Fair	Fair	Permanent	Permanent	Irreversible	Irreversible	Small	Negligible
LCA 4	SENT Landfill	12.88	None	0	n/a	Fair	Fair	n/a	n/a	n/a	n/a	Negligible	Negligible

11.10.2 Significance of Landscape Impacts prior to Mitigation

Using the magnitude of change calculated for each LR and LCA and their sensitivity as described in **Section 11.7**, the significance of impact on each LR and LCA before mitigation has been calculated in accordance with the matrix provided in **Table 11.2** and is summarized in **Table 11.4**.

In summary, three (3) LRs, LR1 (Shrubs and Trees of TKO Area 137), LR6 (Grass, shrubs and trees east of TKO Area 137) and LR9 (Mixed Woodland along lower hillside of Tin Ha Shan) are moderately affected by the proposed development at construction and operation prior to mitigation. LR1 is of low sensitivity but does provide some greening of the area which will be removed and therefore with an intermediate magnitude of change, leads to a moderately significant impact. LR6 will be affected by the Desalination plant and a flexible barrier within the site towards the south east and will also be affected where slope mitigation works fall, but care is being taken to plan the slope mitigation works such that as far as practical no trees will be felled within the Country Park and vegetation clearance will be kept to a minimum. **Section 2.3.1** of the report provides full details of the slope mitigation work and **Figures 11.13 and 11.14** helps illustrate how these works will affect the slope. Changes to this LR are considered minimal but given the high sensitivity, the impact significance is moderate during construction and operation prior to mitigation. LR9 in this area will similarly be partly affected by the slope mitigation works with an estimated 320 trees falling in the vicinity of the works, however the slope mitigation works are being designed such that the trees in the Country Park slope mitigation area will be retained. With regards to the other small area of this LR affected, a road and corner of one building are located here but the areas is very small and the impact to this LR overall is considered to be small. With a medium sensitive LR, this gives a moderately significantly impact.

All other LRs are slightly or insignificantly affected by the construction and operation with the exception of LR11 which at operation is considered to be slightly beneficially affected; the wasteland fill area will have been transformed into a working plant which is a more amenable landscape.

For LCAs, again only one (1) LCA, LCA2 (Clear Water Bay Peninsular Coastal Uplands), is potentially moderately impacted by the slope mitigation work although the Project Site itself will have little effect on it. Although LCA3 (Tathong channel and Joss House Bay) is considered to undergo small changes due to the installation of the seawater intake and submarine outfall and is a highly sensitive LCA, the impact significance is rated as 'Slight' during construction due to the relatively small area of the LCA affected and transient nature of the works. At operation this LCA3 will experience no perceptible change and therefore the impact drops to Insignificant. Similar to the effect on LR11, the effect on LCA1 (Fat Tong O Reclamation) are considered to be slightly beneficial at operation.

The significance of landscape impacts, before implementation of mitigation measures, on LRs and LCAs is summarised in **Table 11.4**. All impacts are adverse unless stated otherwise.

Table 11.4 Significance of Landscape Impacts

LR Code	Name	LR Sensitivity (High/ Medium/ Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Significant/ Moderate/ Slight/ Insignificant)	
			Construction	Operation	Construction	Operation
LR1	Shrubs and Trees of TKO Area 137	Low	Intermediate	Intermediate	Moderate	Moderate
LR2	Shrubs and topography of Tit Cham Chau	High	Negligible	Negligible	Insignificant	Insignificant
LR3	Rocky Shore	High	Negligible	Negligible	Insignificant	Insignificant
LR4	Shrubs and topography of Kwun Tsai Island	High	Negligible	Negligible	Insignificant	Insignificant
LR5	Sandy shore	High	Negligible	Negligible	Insignificant	Insignificant
LR6	Grass, shrubs and trees east of TKO Area 137	High	Small	Small	Moderate	Moderate
LR7	Drainage Channel	Low	Small	Small	Slight	Slight
LR8	Seascape of Joss House Bay and Tathong Channel	Medium	Small	Negligible	Slight	Insignificant
LR9	Mixed Woodland along lower hillside of Tin Ha Shan	Medium	Small	Small	Moderate	Moderate
LR10	Site office area of SENT Landfill	Low	Negligible	Negligible	Insignificant	Insignificant
LR11	Fill Area	Low	Intermediate	Intermediate	Slight	Slight beneficial
LCA 1	Fat Tong O Reclamation	Low	Intermediate	Intermediate	Slight	Slight beneficial
LCA 2	Clear Water Bay Peninsular Coastal Uplands	High	Small	Small	Moderate	Moderate
LCA 3	Tathong Channel and Joss House Bay	High	Small	Negligible	Slight	Insignificant
LCA 4	SENT Landfill	Low	Negligible	Negligible	Insignificant	Insignificant

11.10.3 Suggested Mitigation Measures

Mitigation measures follow the principle of the mitigation pyramid, which is firstly to undertake all means to avoid impacts, then reduce any unavoidable impacts to as low as practically possible and finally to mitigate any remaining impacts. The Project, however, will inevitably still cause some landscape (and visual) impacts.

Many of the mitigation measures suggested will also serve as visual mitigation measures (e.g. compensatory planting can both compensate for trees lost as well as provide visual screening for VSRs) and therefore landscape and visual mitigation measure have been grouped and are referenced as appropriate in the LIA and VIA sections.

Mitigation measures are proposed to be considered during planning, detailed design, construction and operation and often one measure can be relevant to both construction and operation phases of the proposed development. For example detailed design measures will be implemented during construction but will aim to reduce both construction and operation impacts. Equally soft landscape mitigation measures such as compensatory planting may be implemented during construction, but their full effect will often not be appreciated for up to 10 years. All measures should be implemented at the earliest stage possible i.e. at or before construction, particularly for soft landscaping.

With regards MM6, the Natural Terrain Hazard Assessment carried out in accordance with GEO Report No. 138 for the natural slope adjoining the plant area on the east side found that it imposed a landslide risk on the development in the site and therefore landslide hazard mitigation measures are necessary. These are discussed fully in **Section 2.3** and various alternatives have been considered. The option to use localized slope stabilization, localized boulder stabilization, and localized flexible debris barriers in the lower portion of the natural slope and in the plant site is presented as the most suitable. It confers the appropriate degree of safety and protection, using minimal land and causing minimal impact to the Country Park, avoiding tree-felling by careful design around existing trees and not needing extensive earthworks such that vegetation clearance can be minimal, as well as meeting financial requirements for set up and maintenance. For this option, typical flexible barriers of 4 to 5m high tensioned steel meshes supported by steel posts will be used for retaining the landslide debris. Soil nails to stabilize the hillside at the lower section of the natural slope will consist of steel bars installed in drill holes into the hillside and recessed soil nail heads with soil bags allowing regrowth of vegetation on the hillside surface. The boulder and rock stabilization works will involve the construction of local concrete infills and dowels to stop potential boulder movements and after installation of soil nails, the affected soil the slope will be restored with hydro-seeding and planting in order to provide a greening effect. **Figure 11.13a-d** provide some illustrations to help envisage the slope mitigation work. All the measures described below in **Table 11.5** are suggested to mitigate unavoidable impacts from the Project, and listed together with associated funding and implementation agencies.

Table 11.5 Landscape and Visual Mitigation Measures

ID No.	Landscape and Visual Mitigation Measure	Funding Agency	Implementation & Management Agency
MM1	The construction area and area allowed for temporary structures, such as the contractor's office, will be minimized to a practical minimum	WSD	WSD/ Contractor
MM2	At the detailed design stage, the design team will seek to minimize the landscape footprint of the Project and above ground facilities, while satisfying all other requirements.	WSD	WSD/ Contractor
MM3*	Design principles will be adopted to take into account the surrounding area, particularly Clear Water Bay Country Park behind and the nearby waterfront, with due consideration given to: - green roofs where practical (ie without equipment on the roof); - roadside planting; - aesthetic treatment of all structures; - vertical greening; - screen planting along application site; and - landscape enhancement with amenity planting where practical, including planting along the edge (site boundary) fence with native shrubs where feasible, to reduce their visual impact and blend them into the surrounding landscape. (Further details of tree planting and greening are provided below)	WSD	WSD/ Contractor
MM4	All trees within the Project Site or the slope mitigation works area will be carefully protected during construction according to DEVB TCW No. 10/2013 – Tree Preservation.	WSD	WSD/ Contractor
MM5*	No Tree within the Country Park will be felled. Trees within the Site unavoidably affected by the works will be transplanted where practical. For trees that need to be felled, compensatory planting will be provided to the satisfaction of relevant Government departments. A compensatory tree planting proposal including locations of tree compensation will be submitted to seek relevant government department's approval, in accordance with DEVB TC(W) No. 10/2013.	WSD	WSD/ Contractor
MM6	Any slope mitigation works necessary to address natural terrain hazards, will be minimized to minimize any potential environmental impact to the Country Park e.g. soil nailing and rock stabilization will aim to avoid existing trees e.g. should any restoration of vegetation be necessary, the best planting matrix with native species will be established, with the aim of resembling the existing vegetation.	WSD	WSD/ Contractor
MM7	Dredging works for the installation of intake structures and outfall diffusers should be minimized to avoid or reduce any potential environmental impacts to as low as reasonably practicable (ALARP). The intake and outfall structures (e.g. intake openings and diffuser heads) will be prefabricated and transferred to site for installation.	WSD	WSD/ Contractor
MM8	All night-time lighting will be reduced to a practical minimum both in terms of number of units and lux level and will be hooded and directional.	WSD	WSD/ Contractor

ID No.	Landscape and Visual Mitigation Measure	Funding Agency	Implementation & Management Agency
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*Note:

Tree Planting and Greening (MM5, MM3) - Under the proposed scheme for the Project, opportunities for compensatory tree planting within the project boundary have been fully explored and incorporated in the proposed mitigation measures as much as practicable. Considering the available space for tree planting within the project boundary, approximately a total of 300 nos. of heavy standard trees and light standard trees are proposed to be planted on-site at the desalination plant site to compensate for any trees that will be felled. If needed, off-site compensatory planting at Siu Ho Wan water treatment works and other waterworks facilities maintained by WSD would be undertaken. The proposed compensation area on-site is illustrated in **Figure 11.22**. In addition to the compensated trees, as outlined in MM3, new landscape resources such as green roof, vertical greening, shrub planting and raised planters are proposed as alternative complimentary planting within the project boundary to optimize greening opportunities. In addition, to soften and screen the flexible barrier for slope mitigation works, climber planting will also be considered.

11.10.4 Significance of Residual Landscape Impacts

Given the proper implementation of the suggested mitigation measures detailed in **Table 11.5**, the residual landscape impacts upon mitigation are shown in **Table 11.6**, in which appropriate mitigation measures for each LR/LCA are also suggested. No cumulative impacts are considered to change the residual landscape impact ratings.

In summary all landscape impacts will be insignificant by year 10 of operation, with the exception of LR1 and LR7 which due to the loss of block greening and the Drainage Channel respectively will remain 'slight', and LR11. LR11 is the Fill Area of TKO Area 137 and this wasteland will have been transformed into a working plant which is a more amenable landscape; in addition to compensatory tree planting, new landscape resources are proposed for within the site, such as green roof, vertical greening, shrub planting and raised planters as alternative complimentary planting to optimize greening opportunities and overall this LR will slightly benefit from the Project. In addition, with the proposed compensatory trees and the proposed new landscaping of the Project Site, the overall residual impact on existing trees and greenery is considered to be reduced to an acceptable level.

Table 11.6 Residual Impact Significance for LRs and LCAs after Mitigation

LR Code	Name	LR Sensitivity (High/ Medium/ Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Significant/ Moderate/ Slight/ Insignificant)		Recommended Mitigation Measures		Residual Impact Significance UPON Mitigation (Significant/ Moderate/ Slight/ Insignificant)		
			Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation (Day 1)	Operation (Year 10)
LR1	Shrubs and Trees of TKO Area 137	Low	Intermediate	Intermediate	Moderate	Moderate	MM1, MM2, MM3, MM4, MM5	MM3, MM4	Slight	Slight	Slight
LR2	Shrubs and topography of Tit Cham Chau	High	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
LR3	Rocky Shore	High	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
LR4	Shrubs and topography of Kwun Tsai Island	High	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
LR5	Sandy shore	High	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
LR6	Grass, shrubs and trees east of TKO Area 137	High	Small	Small	Moderate	Moderate	MM1, MM2, MM3. MM4, MM5, MM6	MM3, MM5, MM6	Slight	Slight	Insignificant
LR7	Drainage Channel	Low	Small	Small	Slight	Slight	MM1, MM2	none	Slight	Slight	Slight
LR8	Seascape of Joss House Bay and Tathong Channel	Medium	Small	Negligible	Slight	Insignificant	MM7	n/a	Slight	Insignificant	Insignificant
LR9	Mixed Woodland along lower hillside of Tin Ha Shan	Medium	Small	Small	Moderate	Moderate	MM1, MM2, MM3 MM4, MM5, MM6	MM3, MM5, MM6	Slight	Slight	Insignificant
LR10	Site office area of SENT Landfill	Low	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
LR11	Fill Area	Low	Intermediate	Intermediate	Slight	Slight beneficial	MM1, MM2	MM3, MM6	Slight	Slight beneficial	Slight beneficial
LCA 1	Fat Tong O Reclamation	Low	Intermediate	Intermediate	Slight	Slight beneficial	MM1, MM2	MM3, MM6	Slight	Slight beneficial	Slight beneficial
LCA 2	Clear Water Bay Peninsular Coastal Uplands	High	Small	Small	Moderate	Moderate	MM1, MM2, MM4, MM5, MM6	MM5, MM6	Slight	Slight	Insignificant
LCA 3	Tathong Channel and Joss House Bay	High	Small	Negligible	Slight	Insignificant	MM7	n/a	Insignificant	Insignificant	Insignificant
LCA 4	SENT Landfill	Low	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant

11.11 Visual Impact Assessment

11.11.1 Magnitude of Visual Change

VSRs closest to the Project Site, such as residents in LOHAS Park, TKO Area 85 and TKO New Town are most likely to experience higher magnitudes of visual change, in particular viewers at higher levels and with more open views to the Project Site. In reality however, all the residential viewers are over 2,300 m from the Project Site and none will experience large changes in their views.

The magnitudes of visual change on VSRs caused by the Project, before implementation of mitigation measures, are described below and tabulated in **Table 11.7**. All changes are adverse unless stated otherwise.

Overall no VSRs will experience a large change to their views due to the Project at either construction or operation and just two VSRs are considered to experience changes to their views of intermediate magnitude;

- the future workers in TKO Area 137 (O2) although not affected during construction as they will not yet exist, will experience intermediate changes at operation since they will be adjacent to the Plant, and
- Hikers/Campers on Tung Lung Chau (R5) who, although they are 1,300 m or more from the site, have direct views across the Tathong channel to the Project Site and are likely to experience intermediate changes in their view during both construction and operation.

Six (6) VSRs are considered to experience negligible changes to their views, mainly due to being far from the site (3,500 m or more) but also since the Project will blend into the existing landscape well as the existing TKO industrial area is in the foreground for many of these VSRs. They include:

- Future Residents at Pak Shing Kok (H1) who although not affected during construction as they will not yet exist, even at operation are over 3,600 m from the Project Site with the TKO industrial estate in the foreground, very limited views and good alternative views, such that they are considered to experience negligible change;
- Residents of TKO & TKO New Town (H2), users of TKO Chinese Cemetery and Devil's Peak (R11), and Hikers around Black Hill (R12) who although they may all be able to see the Project, due its relatively small part of their total view (with them being 3,500 m or more) and blending into their view of the existing TKO industrial area, are considered to experience negligible changes to their views at construction and operation; and
- Residents of Shek O Village Area (H8) and Visitors to the Museum of Coastal Defence (R16), both of which are across the Tathong Channel from the Project. The residents in Shek O Village Area (H8) live in low rise buildings, have good alternative views and are over 4,400 m from the Project Site, separated by the Tathong Channel. For Visitors to the Museum of Coastal Defence (R16) much of their experience will be focused on indoor exhibitions and while the historical trail outside does have views out across Lei Yu Mun Pass, the Project Site is over 4000 m across the water. For both

these VSRs therefore, any changes during construction and operation are considered negligible.

All remaining VSRs are considered to experience small changes to their views due to the Project at construction and operation.

While the visual changes at construction (such as due to civil works including site clearance, operation of construction machinery, construction of the actual buildings etc) are different to those at operation and are likely to be slightly less at operation, the difference is not considered big enough to warrant a drop in rating of magnitude of change in view, for any of the VSRs.

Table 11.7 Magnitude of Change for VSRs (C=Construction, O= Operation)

VSR Code*	Name	Closest Distance ¹ (m)	Scale ²	Blockage of View ³	Compatibility ⁴		Duration of Impact ⁵		Reversibility of Change ⁶		Magnitude of Change ⁷	
					C	O	C	O	C	O	C	O
H1	Future Residents at Pak Shing Kok (Future)	3600	Small	Nil	Fair	Good	Temporary	Permanent	Partly Reversible	Irreversible	n/a	Negligible
H2	TKO & TKO New Town	3700	Small	Nil	Fair	Good	Temporary	Permanent	Partly Reversible	Irreversible	Negligible	Negligible
H3 (VP3)	LOHAS Park	2300	Small	Minor	Fair	Good	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
H4	TKO Area 85	2455	Small	Minor	Fair	Good	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
H5 (VP2)	Island Resort, Siu Sai Wan	2300	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
H6	Chai Wan Area	3200	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
H7	Heung Fa Chuen Area	3400	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
H8	Shek O Village Area	4450	Small	Nil	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Negligible	Negligible
H9	Cape Collison Correctional Institute	2800	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
H10	Full View Garden, Siu Sai Wan	2400	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
O1	Existing TKO Industrial Estate	950	Small	Minor	Fair	Good	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small

VSR Code*	Name	Closest Distance ¹ (m)	Scale ²	Blockage of View ³	Compatibility ⁴		Duration of Impact ⁵		Reversibility of Change ⁶		Magnitude of Change ⁷	
					C	O	C	O	C	O	C	O
O2	TKO Area 137 (Future)	0	Medium	Partial	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	n/a	Intermediate
O3	Chai Wan Dock Area	2800	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R1	Restored SENT Landfill (Future)	650	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	n/a	Small
R2	Clear Water Bay Golf and Country Club	1500	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R3 (VP1)	Clear Water Bay Country Park	750	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R4	High Junk Peak Trail	800	Small	Minor	Poor	Poor	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R5	Hikers/ Campers on Tung Lung Chau	1300	Medium	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Intermediate	Intermediate
R6	Shek O Country Club and Golf Course	3700	Small	Nil	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R7	Shek O Country Park including Hikers on Dragon's Back	4000	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R8	Hikers around Mount Parker	4100	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R9	Hikers in Cape Collinson Area	2100	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small

VSR Code*	Name	Closest Distance ¹ (m)	Scale ²	Blockage of View ³	Compatibility ⁴		Duration of Impact ⁵		Reversibility of Change ⁶		Magnitude of Change ⁷	
					C	O	C	O	C	O	C	O
R10	Chai Wan Cemetery (East)	3000	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R11	TKO Chinese Cemetery and Devil's Peak	3800	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Negligible	Negligible
R12	Hikers around Black Hill	5100	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Negligible	Negligible
R13	Users of Lei Yue Mun Park	3300	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R14	Restored TKO Landfill (Future)	3000	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	n/a	Small
R15	Heng Fa Chuen Promenade	3300	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
R16	Visitors to the Museum of Coastal Defence	4000	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Negligible	Negligible
T1	Future Cross Bay Link Bridge	2700	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small
T2	Vessels in Tathong Channel & Joss House Bay	0	Small	Minor	Fair	Fair	Temporary	Permanent	Partly Reversible	Irreversible	Small	Small

Type of VSR is denoted in the code: H = Residential; R = Recreational; O = Occupational; T = Travelling

- ¹ Closest Viewing Distance to Project Site (m)
- ² Scale of Development (Large/ Medium/ Small)
- ³ Blockage of View (Dominant/ Partial/ Minor/
Nil)
- ⁴ Compatibility with Surrounding Landscape
(Good /Fair /Poor)
- ⁵ Duration of Impact (Temporary/ Permanent)
- ⁶ Reversibility of Change (Reversible/
Irreversible)
- ⁷ Magnitude of Change (Large/ Intermediate/
Small/ Negligible)

11.11.2 Significance of Visual Impacts prior to Mitigation

Using the sensitivity of each VSR described in **Section 11.8** and noting the magnitude of the visual change each VSR will experience as described in **Section 11.8**, the significance of impact on each VSR before mitigation has been calculated in accordance with the matrix provided in **Table 11.2**. The significance of visual impacts prior to mitigation is described below and summarized in **Table 11.8**.

The Project Site is situated in an area that is naturally fairly shielded by topography to the north east and separated by at least 2 km from viewers across the Tathong Channel on Hong Kong Island. It is also located in an area that is currently being used as a fill area with ongoing earthworks, near the TKO Industrial area and the SENT Landfill such that, particularly during construction, it will blend with the current general character of the area reasonably well.

Overall VSRs will experience moderate to insignificant visual impacts due to the construction and operation of the Project and while no VSRs experience substantial visual impacts, seven (7) VRSs are considered to experience moderate visual impacts prior to mitigation (at construction, operation or both), as explained below.

Given the high sensitivity of residential VSRs, all of them are over 2,300 m away from the Project at their closest point. Although visual changes to residents are therefore only negligible or small, five residential VSRs experience moderate impacts prior to mitigation at both construction and operation (Residents in LOHAS Park, (H3 & VP3), Residents in the TKO Area 85 (H4), Residents in Island Resort, Siu Sai Wan (H5 and VP2), Residents in Chai Wan Area (H6), Residents in Heung Fa Chuen Area (H7). Future workers in the Project area, TKO Area 137 (O2), are considered to be less sensitive since they are occupational VSRs and as they are considered to experience intermediate changes in view with the Project compared to without, they also experience moderate impacts prior to mitigation, but at operation only. Finally Hikers/ Campers on Tung Lung Chau (R5) are considered of medium sensitivity, mainly due to the short duration and occasional nature of their views. At construction they can have direct views of the southern end of the Project Site but are still approximately 1,300 m from the site across the Tathong Channel and are expected to experience intermediate changes in their view, such that impact significance is moderate. Although the impact at operation, when any earthworks and construction machinery are no longer visible, is expected to be slightly less, it is still considered moderate without mitigation.

Two residential VSRs are expected to experience negligible change in their views due to the Project at construction and operation and one future residential VSR at operation only. These include the residents in Shek O Village Area (H8) who live in low rise buildings, have good alternative views and are over 4,400 m from the Project Site, separated by the Tathong Channel. In addition, residents of TKO and TKO New Town (H2) are 3,700 m or more from the Project Site across Junk Bay and with the TKO Industrial estate in the foreground of any views in the direction of the Project Site such that the Project Site will hardly be visible to them and works there are not considered to change their view. This is similar for future residents at Pak Shing Kok (H1) who

are over 3,600 m from the Project Site with the TKO industrial estate in the foreground, very limited views and good alternative views such that again changes in their view, if any, are considered negligible. Other VSRs expected to experience negligible changes in their views mainly due to their distance from the site, other buildings (such as TKO Industrial Estate) and topography blocking views and how the Project will blend with existing views. These include visitors to the TKO Chinese Cemetery and Devil's Peak (R11, over 3,800 m away), Hikers around Black Hill (R12, over 5,200 m away) and Visitors to the Museum of Coastal Defence (R16, over 3,800 m away). All these VSRs who experience negligible change to their views will experience insignificant impacts prior to mitigation.

All remaining VSRs experience slight impacts prior to mitigation at both construction and operation, or just at operation for future VSRs.

Table 11.8 Significant of Visual Impact prior to Mitigation

VSR Code	Name	VSR Sensitivity (High/ Medium/ Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Substantial/ Moderate/ Slight/ Insignificant)	
			Construction	Operation	Construction	Operation
H1	Residents at Pak Shing Kok (Future)	High	n/a	Negligible	n/a	Insignificant
H2	TKO & TKO New Town	High	Negligible	Negligible	Insignificant	Insignificant
H3 (VP3)	LOHAS Park	High	Small	Small	Moderate	Moderate
H4	TKO Area 85	High	Small	Small	Moderate	Moderate
H5 (VP2)	Island Resort, Siu Sai Wan	High	Small	Small	Moderate	Moderate
H6	Chai Wan Area	High	Small	Small	Moderate	Moderate
H7	Heung Fa Chuen Area	High	Small	Small	Moderate	Moderate
H8	Shek O Village Area	High	Negligible	Negligible	Insignificant	Insignificant
H9	Cape Collison Correctional Institute	Low	Small	Small	Slight	Slight
H10	Full View Garden, Siu Sai Wan	Medium	Small	Small	Slight	Slight
O1	Existing TKO Industrial Estate	Low	Small	Small	Slight	Slight
O2	TKO Area 137 (Future)	Medium	n/a	Intermediate	n/a	Moderate
O3	Chai Wan Dock Area	Low	Small	Small	Slight	Slight
R1	Restored SENT Landfill (Future)	Low	n/a	Small	n/a	Slight
R2	Clear Water Bay Golf and Country Club	Low	Small	Small	Slight	Slight
R3	Clear Water Bay Country Park	Medium	Small	Small	Slight	Slight
R4	High Junk Peak Trail	Medium	Small	Small	Slight	Slight
R5	Hikers/ Campers on Tung Lung Chau	Medium	Intermediate	Intermediate	Moderate	Moderate
R6	Shek O Country Club and Golf Course	Low	Small	Small	Slight	Slight
R7	Shek O Country Park including Hikers on Dragon's Back	Low	Small	Small	Slight	Slight
R8	Hikers around Mount Parker	Low	Small	Small	Slight	Slight
R9	Hikers in Cape Collinson Area	Medium	Small	Small	Slight	Slight
R10	Chai Wan Cemetery (East)	Low	Small	Small	Slight	Slight
R11	TKO Chinese Cemetery and Devil's Peak	Low	Negligible	Negligible	Insignificant	Insignificant
R12	Hikers around Black Hill	Low	Negligible	Negligible	Insignificant	Insignificant
R13	Users of Lei Yue Mun Park	Low	Small	Small	Slight	Slight

VSR Code	Name	VSR Sensitivity (High/ Medium/ Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Substantial/ Moderate/ Slight/ Insignificant)	
			Construction	Operation	Construction	Operation
R14	Restored TKO Landfill (Future)	Low	n/a	Small	n/a	Slight
R15	Heng Fa Chuen Promenade	Low	Small	Small	Slight	Slight
R16	Visitors to the Museum of Coastal Defence	Low	Negligible	Negligible	Insignificant	Insignificant
T1	Future Cross Bay Link Bridge	Low	Small	Small	Slight	Slight
T2	Vessels in Tathong Channel & Joss House Bay	Medium	Small	Small	Slight	Slight

* Type of VSR is denoted in the code
 H = Residential (Home)
 R = Recreational
 O = Occupational
 T = Travelling

11.11.3 Suggested Mitigation Measures

The majority of VSRs are considered to experience slight or insignificant visual impacts prior to mitigation, with the highest ratings being 'moderate' impacts experienced by seven VSRs (H3, H4, H5, H6, H7 and R5 at both construction and operation and O2 just at operation). There is a limited need for extensive measures to mitigate visual impacts, nevertheless, appropriate measures to enhance the Project visually and minimise any potential visual impacts further are summarized in **Section 11.10.3** (along with landscape mitigation measures). **Section 11.11.4** below details the effectiveness of the suggested mitigation measures by describing the residual visual impacts for all VSRs.

11.11.4 Significance of Residual Visual Impacts

Photomontages have been used to visualize how the Desalination Plant will appear to those with a view to the Study Site. Five (5) VPs were selected to represent views both close to, further away and across the Tathong Channel from the site to help illustrate the significance of visual impacts. The VP locations are shown in **Figure 11.10** and are as follows:

- Photomontage from VP1 High Junk Peak Trail, R3) (**Figure 11.16a & b**)
- Photomontage from VP2 Podium level at Island Resort , Siu Sai Wan, H5 (**Figure 11.17a & b**)
- Photomontage from VP3 LOHAS Park resident from 65th floor, H3 (**Figure 11.18a & b**)
- Photomontage from VP4 Trail on Knoll to the east of the Project Site (**Figure 11.19a & b**)
- Photomontage from VP5 in Joss House Bay, VSR R5 (**Figure 11.20a & b**)

Given the proper implementation of the suggested mitigation measures detailed in **Table 11.5**, the residual visual impacts upon mitigation are shown in **Table 11.9**, which also suggests that mitigation measures are appropriate for each VSR. Although mitigation measures will alleviate visual impacts for all VSRs, the table hopes to show those most relevant to a particular VSR and therefore if the impact significance prior to mitigation is considered insignificant, or the VSR does not exist yet (during construction) then mitigation measures are not listed for that VSR in the table and presented as 'not applicable - n/a'. Despite mitigation measures at construction such as minimising construction area, protection and preservation of existing trees and vegetation etc, residual impacts ratings are not considered to drop at construction. However at operation, when design principles (such as aesthetic treatments of buildings and any greening of the Project site) will be evident, moderate impacts are all considered to drop in significance to 'slight'. By year 10 of operation, with the maturing of any planting works, for those VSRs far from the site with only partial or glimpse views, impacts are will then all be slight or insignificant.

Table 11.9 Significant of Residual of Visual Impacts (C=Construction, O= Operation)

VSR Code	Name	VSR Sensitivity (High/Medium/Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Substantial/ Moderate/ Slight/ Insignificant)		Recommended Mitigation Measures		Residual Impact Significance UPON Mitigation (Substantial/ Moderate/ Slight/ Insignificant)		
			C	O	C	O	C	O	C	O Day 1	O Year 10
H1	Residents at Pak Shing Kok (Future)	High	n/a	Negligible	n/a	Insignificant	n/a	n/a	n/a	Insignificant	Insignificant
H2	TKO & TKO New Town	High	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
H3 (VP 3)	LOHAS Park	High	Small	Small	Moderate	Moderate	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Moderate	Slight	Slight
H4	TKO Area 85	High	Small	Small	Moderate	Moderate	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Moderate	Slight	Slight
H5 (VP 2)	Island Resort, Siu Sai Wan	High	Small	Small	Moderate	Moderate	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Moderate	Slight	Slight
H6	Chai Wan Area	High	Small	Small	Moderate	Moderate	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Moderate	Slight	Insignificant
H7	Heung Fa Chuen Area	High	Small	Small	Moderate	Moderate	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Moderate	Slight	Insignificant
H8	Shek O Village Area	High	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
H9	Cape Collison Correctional Institute	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Insignificant	Insignificant
H10	Full View Garden, Siu Sai Wan	Medium	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
O1	Existing TKO Industrial Estate	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Slight

VSR Code	Name	VSR Sensitivity (High/Medium/Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Substantial/ Moderate/ Slight/ Insignificant)		Recommended Mitigation Measures		Residual Impact Significance UPON Mitigation (Substantial/ Moderate/ Slight/ Insignificant)		
			C	O	C	O	C	O	C	O Day 1	O Year 10
O2	TKO Area 137 (Future)	Medium	n/a	Intermediate	n/a	Moderate	n/a	MM3, MM4, MM8	n/a	Slight	Slight
O3	Chai Wan Dock Area	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R1	Restored SENT Landfill (Future)	Low	n/a	Small	n/a	Slight	n/a	MM3, MM4, MM8	n/a	Slight	Slight
R2	Clear Water Bay Golf and Country Club	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Slight
R3 (VP 1)	Clear Water Bay Country Park	Medium	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Slight
R4	High Junk Peak Trail	Medium	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R5	Hikers/ Campers on Tung Lung Chau	Medium	Intermediate	Intermediate	Moderate	Moderate	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Moderate	Slight	Slight
R6	Shek O Country Club and Golf Course	Low	Small	Small	Slight	Slight	n/a	n/a	Slight	Slight	Slight
R7	Shek O Country Park including Hikers on Dragon's Back	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R8	Hikers around Mount Parker	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R9	Hikers in Cape Collinson Area	Medium	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R10	Chai Wan Cemetery (East)	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R11	TKO Chinese	Low	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant

VSR Code	Name	VSR Sensitivity (High/Medium/Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance BEFORE Mitigation (Substantial/ Moderate/ Slight/ Insignificant)		Recommended Mitigation Measures		Residual Impact Significance UPON Mitigation (Substantial/ Moderate/ Slight/ Insignificant)		
			C	O	C	O	C	O	C	O Day 1	O Year 10
	Cemetery and Devil's Peak										
R12	Hikers around Black Hill	Low	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
R13	Users of Lei Yue Mun Park	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R14	Restored TKO Landfill (Future)	Low	n/a	Small	n/a	Slight	n/a	MM3, MM4, MM8	n/a	Slight	Slight
R15	Heng Fa Chuen Promenade	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
R16	Visitors to the Museum of Coastal Defence	Low	Negligible	Negligible	Insignificant	Insignificant	n/a	n/a	Insignificant	Insignificant	Insignificant
T1	Future Cross Bay Link Bridge	Low	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Insignificant
T2	Vessels in Tathong Channel & Joss House Bay	Medium	Small	Small	Slight	Slight	MM1, MM3, MM4, MM6, MM8	MM3, MM4, MM8	Slight	Slight	Slight

11.12 Conclusion

11.12.1 Landscape Impact

The majority of the Project Site falls within the existing fill bank at Fat Tong Chau (LR 11 Fill Area and LCA1 Fat Tong O Reclamation) which is currently landscape of low quality with little valuable vegetation or amenity value and therefore in general the Project at construction and operation is considered to have little landscape impact. The periphery of the main Project Site may affect some of the lower adjoining hillside and its associated vegetation, however, and as such LRs 6 (Grass, shrubs and trees east of TKO Area 137) and 9 (Mixed Woodland along lower hillside of Tin Ha Shan) and LCA2 (Clear Water Bay Peninsular Coastal Uplands) may be slightly or moderately affected at construction and with the loss of the block greening provided by LR1 (Shrubs and Trees of TKO Area 137) this LR is also moderate affected prior to mitigation. Slope mitigation works have been carefully considered to ensure there is minimal disturbance to the landscape, as fully discussed in **Section 2.3.1**, and various alternatives have been reviewed. The option to use localized slope stabilization, localized boulder stabilization, and localized flexible debris barriers in the lower portion of the natural slope and in the plant site is presented as the most suitable and **Figure 11.13** provides some illustrations to help envisage the slope mitigation work. Notably there will be no tree felling as a result of the slope mitigation within the Country Park as far as practical. In addition for any trees that do require felling, as described in **Section 11.10.3**, these will be compensated for with direct compensatory planting as well as the optimization of greening opportunities within the project boundary, with the proposed creation of new landscape resources using green roof, vertical greening, shrub planting and raised planters. In addition, to soften and screen the flexible barrier for slope mitigation works, climber planting will also be considered. It is considered that given the compensatory tree planting and the proposed careful greening of the Project Site landscape, the overall residual impact on existing trees and greenery would be reduced to an acceptable level. It is therefore considered that by year 10 of operation all landscape impacts on LRs and LCAs will be insignificant, with the exception of LR1 and LR7 which due to the loss of block greening and the Drainage Channel respectively will remain 'slight', and LR11 and LCA1 (both elements of Fat Tong O fill area) which at operation are considered to be slightly beneficially affected since the wasteland fill area will have been transformed into a working plant with a more amenable landscape.

11.12.2 Visual Impact

The Project includes low rise buildings and is situated in an area that is naturally shielded by topography to the north east and separated by at least 2 km from viewers across the Tathong Channel on Hong Kong Island to the south east. All residential VSRs identified are at least 2 km from the Project Site and those VSRs that are close are all workers or recreational VSRs which represent low numbers of viewers. The Project will also blend with existing character of the area, given it is located in an area that is currently being used as a fill area with ongoing earthworks and is near the TKO Industrial area and the SENT Landfill. Given these factors the general assumption is that the Project will have limited visual impact. The VIA confirms that overall the

majority of VSRs will experience small or insignificant visual impacts due to the construction and operation of the Project without mitigation.

Seven (7) VSRs are considered to experience moderate visual impacts prior to mitigation (at construction, operation or both): five residential VSRs (Residents in LOHAS Park, (H3 & VP3), Residents in the TKO Area 85 (H4), Residents in Island Resort, Siu Sai Wan (H5 and VP2), Residents in Chai Wan Area (H6), Residents in Heung Fa Chuen Area (H7)), one occupational VSR at operation only (Future workers in TKO Area 137 (O2)) and one recreational VSR (Hikers/ Campers on Tung Lung Chau (R5)). With mitigation measures centred around the principles of careful detailed design of the facilities to blend with the existing landscape, conserving existing greenery and providing some soft landscaping (e.g. roadside planting, etc), all visual impacts are considered to be slight or insignificant by year 10 of operation.

11.12.3 Overall Landscape and Visual Impact

Overall, it is considered with reference to Annex 10 of the EIAO-TM, the landscape and visual impacts of the Project are acceptable with mitigation measures.