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## 11 LANDSCAPE & VISUAL IMPACT ASSESSMENT

This section presents the Landscape and Visual Impact Assessment (LVIA) from the construction and operation of the proposed LNG terminal at Black Point, adjacent to the existing Black Point Power Station.

### 11.1 ASSESSMENT METHODOLOGY

The main components of the LVIA are as follows:

- Description of the project;
- Review of planning and development control framework;
- Baseline study of landscape resources;
- Landscape impact assessment during construction and operation;
- Visual impact assessment during construction and operation;
- Recommendations for landscape and visual mitigation measures for both construction and operation stage;
- Assessment of night lighting and glare;
- Baseline study of landscape character;
- Landscape character impact assessment during construction and operation, and;
- Assessment of residual impact and conclusion on the acceptability of the Project.

## 11.2 INTRODUCTION AND PROJECT DESCRIPTION

The background to the project and the general description of the LNG terminal at Black Point is presented in *Section 3*.

The following description of the major visual components of the LNG terminal and supporting infrastructure is based on the preliminary design and will be subject to refinement at the detailed engineering design stage. The preliminary layout plan, which shows the key visual features of the proposal, is illustrated in *Figure 11.1*.

It must be noted that the layout presented in *Figure 11.1* has been selected from a number of alternative site layouts in view of its minimisation of landscape and visual impacts to the Project area. The design, dimensions and location of the LNG terminal's structures indicated in the preliminary layout are thus the result of a preliminary assessment which has enabled the optimisation of the LNG terminal's design/layout in relation to the Project area's landscape character (i.e. morphology, exposure to sensitive receivers, etc.).

### 11.2.1 Site Area

The LNG Terminal will be constructed on approximately 21ha of land. This will be a combination of:

- 5 ha of level land which will require excavation.
- 16 ha of land which will be created by reclamation.

### 11.2.2 Construction Impacts.

*Figure 11.2* shows the extent of construction areas. The approximate areas are as follows:

- Excavation / Site Levelling – 42,000 m<sup>2</sup>
- Reclamation – 163,000 m<sup>2</sup>
- Cut / Slope stabilisation – 34,000 m<sup>2</sup>

### 11.2.3 Land Excavation

Excavation of around 5 ha of land on the northeast corner and northwest edge will require levelling, grading and blasting. This area will be used primarily for locating two of the LNG storage tanks.

The initial phase of site formation, including site clearance and excavation of vegetation, topsoil and top fragmented layers of rock, will be excavated by machine. The remaining excavation will be conducted by drilling and blasting. The fragmented rock will be used for the reclamation of the seawall core, secondary and primary armour layers, road embankments and can also be crushed for use as road base, sub-base, selected fill and blinding for buildings. Spare rock will be disposed of off-site in accordance with relevant regulations.

Site formation will involve cutting into the side slopes of Black Point. The major visual components of this work will be the resultant cut-slopes up to a maximum height of 105m.

#### 11.2.4 *Land Reclamation*

Reclamation of about 16 ha of land will be created off Black Point using excavated material, marine sand fill and if suitable and available, public filling materials. The works will involve construction of a vertical and sloping seawall. The reclamation area will be used primarily for the LNG terminal process area and other associated facilities, such as the lay down area and administration buildings. A future third LNG storage tank can be constructed on the reclaimed area.

A permanent seawall comprising sloping (approximately 680 m long) and vertical (approximately 430 m long) block-work will be constructed around the seaward boundary of the reclamation to protect the reclamation site from wave and tidal action.

#### 11.2.5 *LNG Jetty*

The LNG jetty will comprise of one approximately 130 m long trestle leading to the jetty structures and unloading arms for LNG carriers to unload LNG. The trestle will be supported on piles and a concrete deck will be placed on top to serve as an access road to the jetty. The steel structure will also support pipe racks and associated facilities.

#### 11.2.6 *LNG Terminal Facilities*

The LNG Terminal Facilities and expansion areas will include installation of the following:

(Note: all dimensions are approximate based on a preliminary design)

- Two cryogenic LNG Tanks with space for a third tank for future expansion, nominal size of 90m diameter by 49m high to the top of the dome and capacity each of 180,000 cubic metres. Alternative tank sizes may be considered by CAPCO, however the capacity of the tanks will be similar. The potential size of these tanks could be approximately 64m high with a smaller diameter. In order to assess the worst case scenario, a total tank height of 70m PD (64m tank + 6m) is shown in the photomontages.

- Process Area
- Low Pressure and High Pressure pumping systems
- Vaporization (Re-gasification) Area including 6 sea water vaporizers
- Vents - the low pressure vent is 50m in height and the high pressure vent is 60m in height.
- Maintenance Workshop (40m x 20m x 15m high)
- Administration Building (50m x 20m x 4m high)
- Guard House (10m x 5m x 4m high)
- Utility Area (40m x 20m x 4m high)
- Control Room (30m x 25m x 4m high)
- Compressor Shelter (20m x 20m x 8m)
- Unloading arms
- Jetty control pulpit on jetty head (10m x 5m x 4m)

The major visual component will be the proposed LNG Tanks. Separate buildings will be required for the Process Area, Maintenance Workshop, Administration Building, Guard House, Utility Area, and Control Room. While these buildings will be smaller visual components they will contribute to the overall industrial appearance of the site. Emergency Vehicle Access (EVA) will be within the constructed area and no additional EVA access is to be created.

### 11.2.7 *LNG Carrier*

LNG can be transported to the receiving terminal in carriers of differing sizes. An LNG carrier of 125,000 cubic metres is approximately 285m LOA, 43m beam and a draft of 11.3m. A class of LNG carriers of up to 215,000 cubic metres may also be considered by CAPCO and an LNG carrier of such volume would be 315m LOA, 50m beam and 12m draft.

The transit of the LNG carrier to the Black Point receiving terminal within HKSAR waters, will be via the pilot pickup point to the South of Lamma Island close to the boundary of HKSAR waters. When secured alongside at the jetty, unloading arms will be connected to the carrier.

The discharge of LNG from the carrier takes approximately 18 hours. It will also take approximately 3 hours is required for mooring, cool down, connecting the unloading arms, and cargo measurement. In addition approximately 3 hours for cargo measurement, arm purging, disconnecting



Scale 1:5000 (A3)

0 100 500M

**BLACK POINT**  
**Fig 11.1 Proposed Terminal**  
**Layout**

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 & Urban Design  
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South China Sea

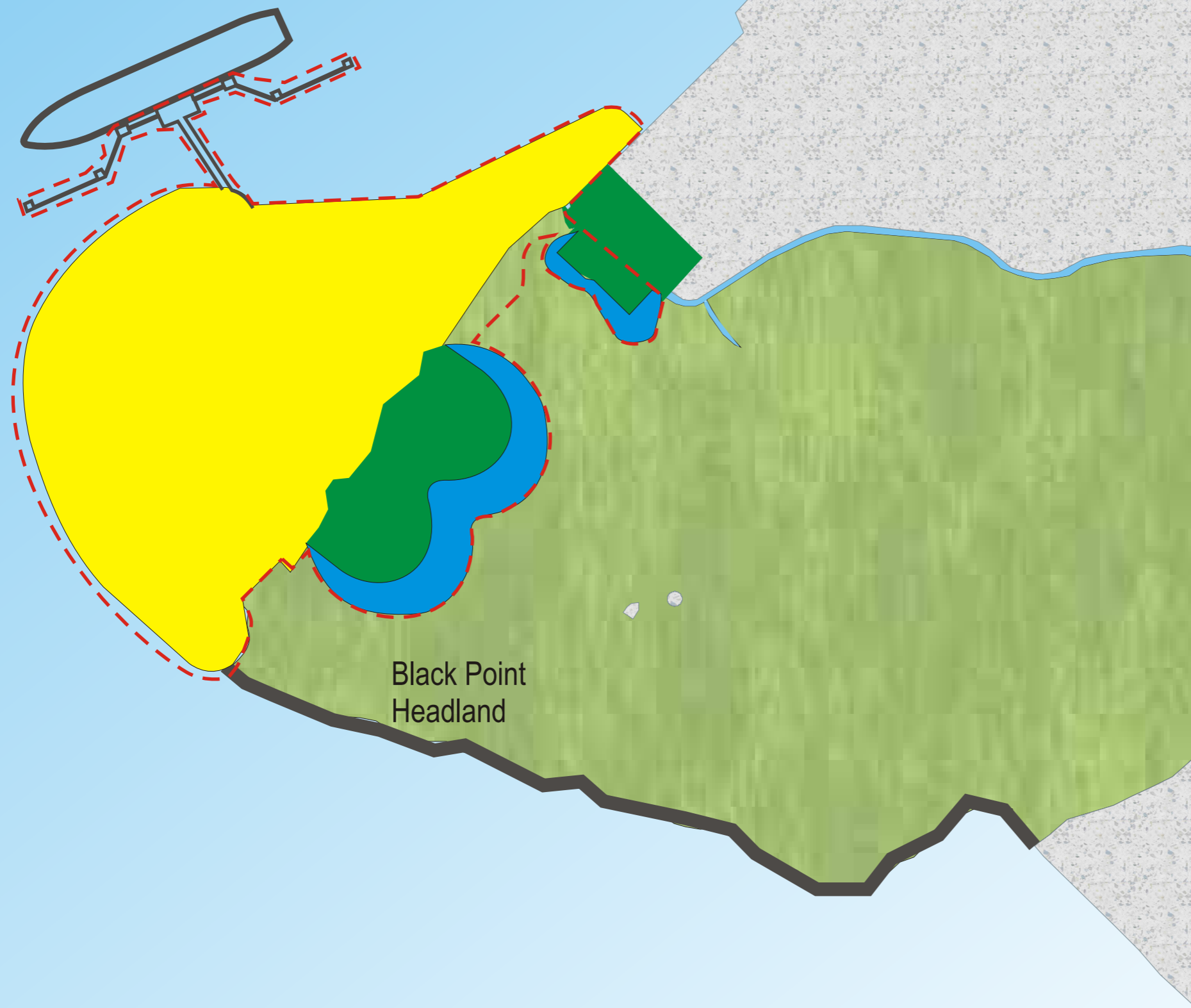
Black Point Power Station

Black Point Headland

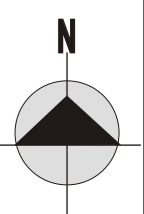
South China Sea

LEGEND

-  Excavation
-  Cut
-  Reclamation
-  Extent of construction

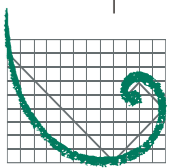


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**BLACK POINT**  
**Fig 11.2 Construction**  
**Areas**

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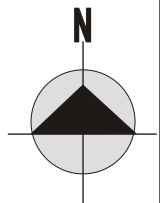


規劃署  
Planning Department

比例尺  
SCALE  
公里 km 0 2 4 6 8 10 km

圖例 NOTATION

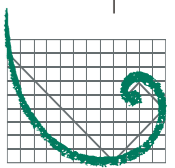
- 已納入分區計劃大綱圖的土地範圍  
AREA COVERED BY OUTLINE ZONING PLANS
- 18 規劃區編號  
PLANNING AREA NUMBER
- 規劃區界線  
PLANNING AREA BOUNDARY



# BLACK POINT

## Fig 11.3 OZP Plan

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arms, and unmooring. It is envisaged, based on the terminal throughput, that one LNG carrier will berth at the terminal every five to eight days.

In view of this frequency, the Visual Impact Assessment and associated photomontages in *Section 11.17* include the carrier moored alongside the LNG jetty.

### 11.2.8 *Construction program*

The construction program is outlined in *Part 3, Section 3* of this EIA.

The landscape and visual mitigation works are to be carried alongside the construction of the terminal where technically feasible.

## 11.3 *LEGISLATION REQUIREMENT AND EVALUATION CRITERIA*

The methodology of the LVIA is based on *Annexes 10 and 18* in the Hong Kong SAR Government's *Technical Memorandum on the Environmental Impact Assessment Process (EIAO-TM)* under the *EIA Ordinance (Cap.499, S16)*, entitled "Criteria for Evaluating Visual and Landscape Impact" and "Guidelines for Landscape and Visual Impact Assessment", respectively and the *EIAO Guidance Note No. 8/2002 "Preparation of Landscape and Visual Impact Assessment Under the Environmental Impact Assessment Ordinance."*

The landscape assessment considers the impact of the proposed development on the existing landscape and particularly on the landscape character units within 500m of the development site.

The visual assessment analyses the impact of the proposed development on the existing views and the visual amenity, particularly from the Visually Sensitive Receivers (VSR) within the viewshed. In order to illustrate the visual impacts of the proposed LNG Terminal, photomontages prepared from selected viewpoints compare the existing conditions with the view after construction. The residual impacts are evaluated qualitatively, in accordance with the requirements of *Annex 10* of the *EIAO-TM*.

### 11.3.1 *Planning Issues*

There are currently no Outline Zoning Plans (OZP's) covering the proposed Black Point site (see *Figure 11.3*). Therefore, the LVIA will be assessed against the baseline conditions of the area.

## 11.4 *LANDSCAPE ASSESSMENT*

In accordance with *Annex 18* of the *EIAO-TM*, the landscape impact assessment will cover the following:

- **Describe the baseline landscape.** This section identifies and describes the landscape resources within 500m of the development site. The existing

landscape resources can be based on both topography and vegetation. This section will also describe edges as different Landscape Resources (LR's).

- **Map the distribution of the LR's at Black Point.** This section will map both the distribution of the LR's at present.
- **A qualitative and quantitative assessment methodology.** This is based on assessing thresholds that can determine the magnitude of change and sensitivity to change of a particular LR.
- **Analyse the landscape impact during construction and operation.** This section analyses the extent to which these LR's are affected by the proposal, using both quantitative and qualitative assessments.
- **Discuss mitigation measures.** This section examines landscape measures that will contribute to reducing any landscape impacts and that will enhance the landscape associated with the development. This may include planting, new landscaped areas and re-vegetation. The residual landscape impacts are also analysed. Mitigation measures during construction and operation will be discussed, at day 1 of mitigation and at year 10 of mitigation. An analysis of the effectiveness of these mitigation measures is provided.
- **Provide Conclusions on the impacts of the project.** These are discussed along with the Visual Impact and Landscape Character Impacts in *Section 11.22*.

## 11.5

### BASELINE LANDSCAPE DESCRIPTION

As specified by the brief, the area for the Landscape Impact Assessment covers the area within 500 metres of the proposed development. The landscape baseline study examines the potential impacts on the site and surrounding areas in terms of both the landscape resources and the landscape character areas.

The landscape character areas and resources of the study area have been categorized according to the presence of common elements. These include factors such as:

- Topography;
- Vegetation type (both species and age);
- Built forms;
- Evidence on human modifications;
- Land use (past and present); and

- Edges.

## 11.6 BROAD BRUSH TREE SURVEY

As outlined in the EIAO Guidance Note No. 8/2002 "Preparation of Landscape and Visual Impact Assessment Under the Environmental Impact Assessment Ordinance." A broad-brush tree survey has been carried out.

A total of 10 tree groups were recorded within the proposed Project Area. The tree species were dominated by native tree species such as *Ficus superba*, *Ficus microcarpus*, *Litsea glutinosa* and *Microcos paniculata*.

None of the trees recorded in the proposed Project Area are rare, protected by law or of high amenity value. Most of the trees have reached maturity and are scattered along the northern coastline of the headland with an average of 3 individuals within a group. Most of them are poor in form and health condition due to overcrowding of the trees and the limited growth space at the verge of the rocky shore. All of the trees are between 2 and 4 metres in height, whilst crown spread is on average 2.5 metres. The understorey was densely occupied by native shrubs and vines including *Sapium discolor*, *Bridelia tomentosa*, *Cratogeomys cochinchinense* and *Taxillus chinensis*.

The major tree groups are identified in *figure 11.11*

### 11.6.1 Landscape Resources

Seven Landscape Resources (LR's) have been identified as the following:

- LR1 Plantation;
- LR2 Shrubland;
- LR3 Shrubby Grassland;
- LR4 Stream/Channel;
- LR5 Developed Area;
- LR6 Rocky Shoreline; and,
- LR7 Power Station Edge

An understanding of the sensitivity to change of the LR's is important when analysing the overall landscape impact of the project upon the LR's.

Factors affecting the sensitivity of change for evaluation of landscape are:

- Quality of Landscape Resources;

- Importance and rarity of special landscape elements;
- Ability of the landscape to accommodate change;
- Significance of the change in the local and regional context; and
- Maturity of the landscape.

The degree of sensitivity of the LR's is classified as follows:

- *High* –important components or landscape of particularly distinctive character susceptible to small changes;
- *Medium* –a landscape of moderately valued characteristics reasonably tolerant to change;
- *Low* –a relatively unimportant landscape which is able to accommodate extensive change.

The following section describes each of the landscape resources.

#### 11.6.2 *Plantation (LR 1).*

The Plantation is dominated by *Acacia confusa*, *Melaleuca leucadendron*, *Lophostemon conferta* and *Cassia surratensis*. The plants are generally less than 5 years old and no rare or protected species were found. The plantation also includes an area of orchard that contains mainly *Dimocarpus longan* and *Litchi chinensis*.



Figure 11.4 *Plantation (LR 1)*

Plantation accounts for 4.3 ha of the study area. It is an immature landscape that was the result of human activity. Plantation is considered to have a medium sensitivity to change.

### 11.6.3 *Shrubland (LR 2)*

The Shrubland area is dominated by native species including *Celtis sinensis*, *Aporosa dioica*, *Cassytha filiformis*, *Gordonia axillaries*, *Litsea rotundifolia*, *Sterculia lanceolata* and *Caesalpinia vernalis*. The canopy height is generally 2-3 metres tall.



**Figure 11.5** *Shrubland (LR 2)*

This LR is one of the most commonly occurring LR in the study area and is relatively immature. This area accounts for 46.6 ha of the study area. Shrubland is considered to have a medium sensitivity to change.

### 11.6.4 *Shrubby Grassland (LR 3)*

This area consists of grassy areas with shrub species scattered mainly in the gully areas. The dominant species include *Ischaemum aristatum*, *Digitaria sanguinalis* and *Rhynchelytrum repens*. The general height of plants in this area is 0.5-1.5 metres.



**Figure 11.6** *Shrubby Grassland (LR 3)*

This LR accounts for 18.2 ha of the study area. This landscape appears to be immature and the result of regeneration following past clearing. Shrubby Grassland is considered to have a low sensitivity to change.

**11.6.5** *Stream / Channel (LR 4)*

This area consists of a natural stream and two sections of storm-water drainage channel. The drainage channels are man-made and are concrete lined.



**Figure 11.7** *Stream / Channel (LR 4)*

The drainage channels are confined to the northern edge of the hill slope and the stream extends a small way up the hill slope and flows into the drainage channel. This LR covers approximately 0.7 ha of the study area. The natural areas of the stream channel have a medium sensitivity to change, with the man made channels having a low sensitivity to change.

#### **11.6.6** *Developed Area (LR 5)*

This area is predominantly comprised of the Black Point Power Station. There is some vegetation planted within this area, mostly for landscaping purposes. The dominant species are: *Melaleuca leucadendron*, *Schefflera octophylla*, *Duranta repens*, *Cassia surattensis* and *Bauhinia blackeana*.



**Figure 11.8** *Developed area (LR 6)*

This LR covers approximately 43.6 ha of the study area and has a low sensitivity to change.

**11.6.7** *Rocky Shoreline (LR 6)*

This is the dominant natural edge around Black Point. It is generally comprised of rocks with some pockets of vegetation.





*Figure 11.9 Rocky Shoreline (LR 6)*

The Rocky Shoreline is an attractive feature to mariners and visitors to the headland. This LR occupies approximately 1.25 km of the ocean edge within the study area. The rocky shoreline has a high sensitivity to change.

**11.6.8 Power Station Edge (LR 7)**



**Figure 11.10 Power Station Edge (LR 7)**

This is the man made armour rock edge of the existing Black Point Power Station. It occupies 0.6 km of the ocean edge within the study area. The Power Station Edge has a low sensitivity to change.

### 11.7 THE DISTRIBUTION OF LR'S

Figure 11.11 shows the present distribution of LR's within the study area of Black Point. The most dominant unit is shrubland (41% of the study area), followed by the Developed Area which is approximately 38.4% of the study area.

**Table 11.1 Summary Table of Baseline conditions**

LR	Description	Area / Length	% of Total Area / Length
1	Plantation	4.3 ha	4%
2	Shrubland	46.6 ha	41%
3	Shrubby Grassland	18.2 ha	16%
4	Stream/Channel	0.7 ha	0.6%
5	Developed Area	43.6 ha	38.4%
<b>Total Area</b>		<b>113.4 ha</b>	<b>100%</b>
6	Rocky Shoreline	1.25 km	68%
7	Power Station Edge	0.6 km	32%
<b>Total Length</b>		<b>1.85 km</b>	<b>100%</b>

This Table shows the dominance of Shrubland and the Developed Area as the most common LR's. The Rocky Shoreline and Power Station Edge are similar in length within the study area.

### 11.8 LANDSCAPE RESOURCE IMPACTS











The two key factors that affect the evaluation of Landscape Resource impacts are the magnitude of change and the sensitivity of the Landscape Resources to that change. The sensitivity to change for each of the LR's has been described above and the factors affecting the magnitude of change are outlined below.

Factors affecting the *magnitude of change* for assessing landscape impacts are:

- Compatibility of the project with the surrounding landscape, i.e. how well does the proposed development fit with its surroundings. For example, a new housing development constructed in an area with other housing developments or built forms will have a higher compatibility.
- Scale of the development, i.e. how big is the development relative to its surroundings. For example a 30 storey building constructed on Hong Kong harbour is considered 'small scale'. However, the same development constructed in Sai Kung would be considered 'large scale'



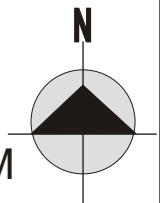
**LEGEND**

-  Plantation
-  Shrubland
-  Shrubby Grassland
-  Stream /Channel
-  Developed Area
-  Rocky Shoreline
-  Tree Group
-  Power Station Edge
-  Extent of construction
-  500m boundary from extent of works

**GROUP TREE INFORMATION**

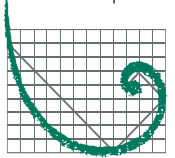
No.	Name	Approx. Qty
1	Sterculia lanceolata	1
2	Ficus superba, Litsea glutinosa, Dimocarpus longan, Microcos paniculata, Ficus microcarpus	8
3	Ficus superba	3
4	Ficus superba	1
5	Ficus microcarpus, Bridelia tomentosa	2
6	Microcos paniculata, Dimocarpus longan, Litsea glutinosa	4
7	Ficus microcarpus, Melia azedarach, Litsea glutinosa	4
8	Ficus microcarpus, Litsea glutinosa	5
9	Litsea glutinosa	1
10	Ficus microcarpus	1

Scale 1:10000 (A3)



**BLACK POINT**  
**Fig 11.11 Landscape Resources Existing**

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- Reversibility of change. This refers to how easily the changes on the landscape can be reversed. For the purposes of this assessment, we have assumed the terminal changes are 'irreversible'.

The magnitude of change is classified as follows:

- *Large* – notable change in the landscape characteristics over an extensive area ranging to very intensive change over a more limited area;
- *Intermediate* – moderate changes to a local area;
- *Small* – changes to specific landscape components;
- *Negligible* – no substantial changes to the baseline condition.

The landscape impact is a product of the magnitude of change the Terminal will have and the sensitivity of the Landscape Resources to that change. *Table 11.2* shows the significance threshold of the Landscape Resource impacts.

Table 11.2 Significance Threshold of Potential Landscape Resource Impact

	Sensitivity to Change			
		Low	Medium	High
Magnitude of Change caused by Proposals	Large	Moderate Impact	Moderate/Significant Impact	Significant Impact
	Intermediate	Slight / Moderate Impact	Moderate Impact	Moderate / Significant Impact
	Small	Slight Impact	Slight / Moderate Impact	Moderate Impact
	Negligible	Negligible Impact	Negligible Impact	Negligible Impact

Table 11.3 provides some definitions of the significance thresholds for Landscape Impacts.

Table 11.3 Adverse / Beneficial Impact of Landscape Impact

Significant:	Moderate:	Slight:	Negligible
Adverse / beneficial impact where the proposal would cause significant degradation or improvement in existing landscape baseline conditions	Adverse / beneficial impact where the proposal would cause noticeable degradation or improvement in existing landscape baseline conditions	Adverse /beneficial impact where the proposal would cause a barely noticeable degradation or improvement in existing landscape conditions or where the changes brought about by the project would not be apparent in visual terms	The proposal does not affect the existing landscape baseline conditions

### 11.9 UNMITIGATED LANDSCAPE IMPACTS DURING CONSTRUCTION

Table 11.4 shows the potential impact of the proposed development on each of the LR's and the potential overall impact based on the preceding Significance Threshold of Potential Landscape Impact Assessment Matrix.

This overall impact does not take into account the effects of remediation / mitigation works after construction. These will be discussed in Section 11.10

**Table 11.4 Unmitigated Landscape Impact Significance Threshold Matrix**

LR	Description	Area / Length (2005)	LR affected by proposed development	% of LR Area / Length affected	Approx. No of trees affected	Sensitivity to change	Magnitude of change	Significance threshold of Landscape Impact
1	Plantation	4.3 ha	Nil	0%	Nil	Medium	Negligible	Negligible
2	Shrubland	46.6 ha	4.9 ha	11%	40	Medium	Large	Moderate-Significant
3	Shrubby Grassland	18.2 ha	Nil	0%	Nil	Low	Negligible	Negligible
4	Stream/Channel	0.7 ha	0.04 ha	6%	Nil	Medium	Intermediate	Moderate
5	Developed Area	43.6 ha	1 ha	2%	Nil	Low	Small	Slight
<b>Total</b>		<b>113.4 ha</b>	<b>5.96 ha</b>					
6	Rocky Shoreline	1.25 km	0.6 km	48%	Nil	High	Large	Significant
7	Power Station Edge	0.6 km	0.08 km	1%	Nil	Low	Intermediate	Slight/Moderate
<b>Total</b>		<b>1.85 km</b>	<b>0.68 km</b>					

The proposed development will impact on approximately 6 ha of the land area and 0.68 km of the ocean edges. Figure 11.12 shows the unmitigated potential impacts on the Landscape Resources of Black Point.

#### 11.9.1 Summary of Landscape Impacts

##### *Significant Landscape Impacts*

The only potentially high landscape impact is on the Rocky Shoreline. The utilization of natural rocks in the artificial walls will partly compensate, however this is an impact of the development that will not be able to be fully mitigated.

##### *Moderate-Significant Impacts*

Approximately 11% of the Shrubland area will be impacted. This impact would be mitigated by remediation works that encouraged the natural regeneration of native plant species commonly found within this LR.

*Moderate landscape impacts*

There will also be a moderate impact on the Stream/Channel LR's, however this impact will be on the more modified concrete areas with the more natural areas being unchanged.

*Slight/Moderate Impacts*

There will be a slight/moderate impact on the Power Station Edge. This area is of low sensitivity and the new terminal will create a new edge of similar appearance.

*Slight Impacts*

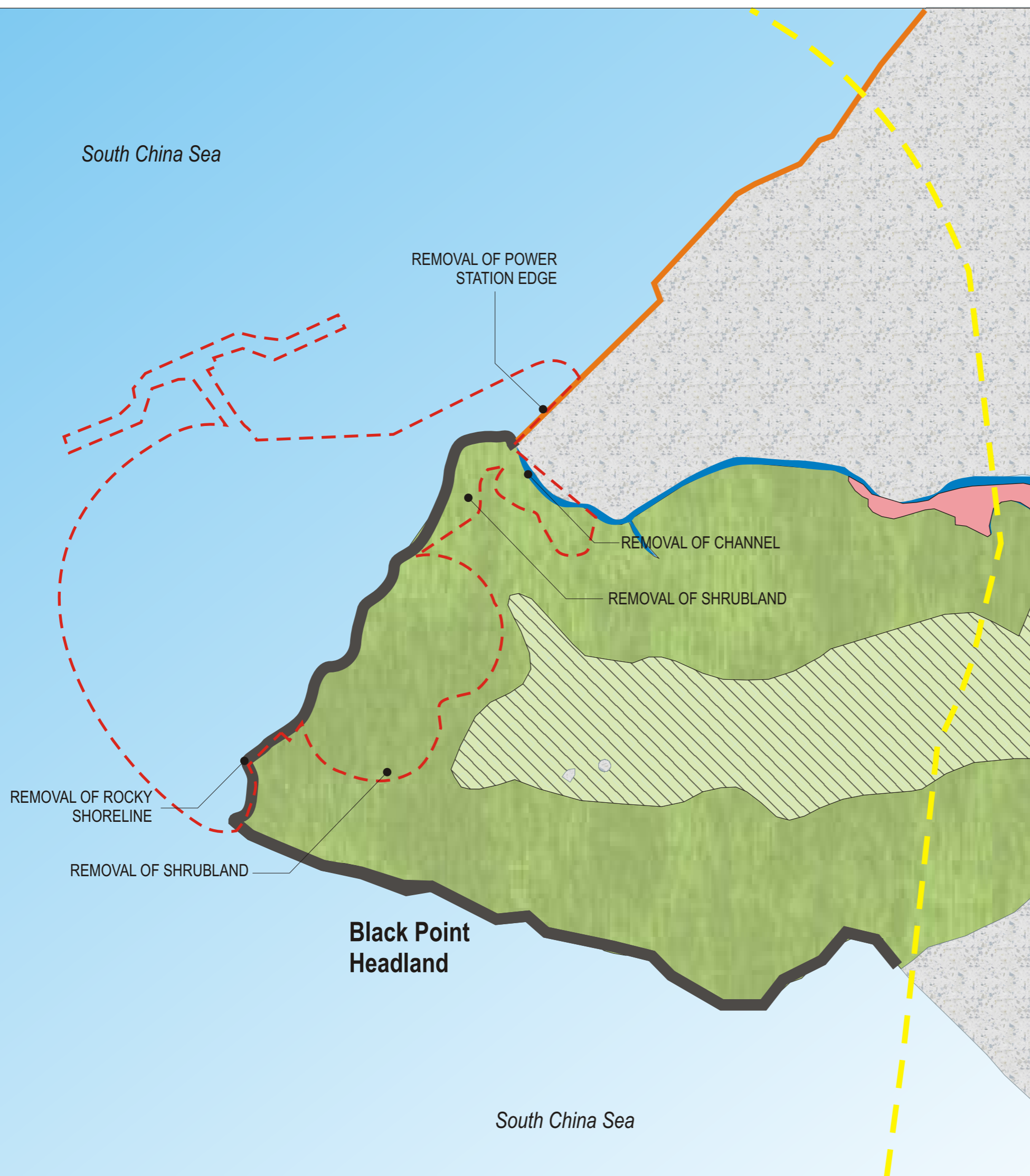
There will be a slight impact on the Developed Area, but the new terminal will create additional areas to replace those affected.










*Negligible Impacts*

There will be negligible impacts on the Plantation and Shrubby Grassland areas.

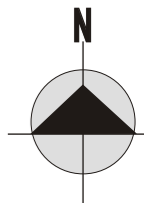
**11.9.2** *Landscape Impacts during operation*

It is anticipated that all of the impacts on the Landscape Resources of Black Point will be created during the construction phase, therefore no impacts on the Landscape Resources are expected during operation.



LEGEND		AREA/LENGTH REMOVED
	Plantation	Nil
	Shrubland	4.9 ha
	Shrubby Grassland	Nil
	Stream /Channel	0.04 ha
	Developed Area	1 ha
	Rocky Shoreline	0.6 km
	Power Station Edge	0.08 km
	Extent of construction	
	500m boundary from extent of works	

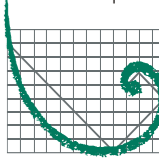
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## FIG 11.12 Landscape Resource Impacts

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 Taikoo Place  
 Island East, Hong Kong



Project No. 0018180  
 June 2006

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## 11.10 LANDSCAPE MITIGATION

The final detailed Landscape Mitigation Measures will be the subject of a Landscape Master Plan that will be submitted for approval to the relevant Authority prior to construction.

As mentioned in *Section 11.2*, the preliminary layout assessed in this EIA Report has been selected from a number of alternative site layouts in virtue of its minimisation of landscape and visual impacts. The selection of the preferred preliminary layout was determined by a preliminary landscape and visual impact assessment of the alternative layouts.

Due to the operational requirements of the terminal, the opportunities for the establishment of vegetation are small. A compact layout has been adopted to allow for the operations of the terminal, meanwhile also reducing the size of the reclamation as far as possible. Landscape berms along the ocean edge of the terminal cannot be created as this would require additional reclamation which is to be avoided, and landscape elements along this edge would potentially interfere with Emergency Vehicle Access to the site, which is mostly via marine traffic.

The landscape mitigation measures proposed will be installed progressively throughout the construction of the LNG terminal where technically safe and practical. This will assist in enhancing the effectiveness of the mitigation measures from the first day of operation.

The mitigation measures discussed below are proposed to reduce the potential impacts on the existing Landscape Resources and provide a potential enhancement of the existing landscape quality. *Figures 11.13 and 11.14* show the approximate locations of the following mitigation measures.

*LMM 1 – Cultivation of areas compacted during construction.* Areas compacted during the construction phase that are not required during the operations phase, are to be cultivated to a depth of up to 300mm in accordance with the future Landscape Specification.

*LMM 2 – Soil stabilisation and embankment planting.* During the design process a soil stabilisation and embankment planting strategy will be developed to ensure that all land affected by slope excavation can be replanted. All soil preparation and the selection and provision of suitable growing medium will be completed in accordance with the relevant best practice guidelines.

*LMM 3 – Tree and shrub planting.* Planting of trees and shrubs is to be carried out in accordance with the Landscape Details and the relevant best practice guidelines. Plant densities will be provided in future detailed design

documents and will be selected so as to achieve a finished landscape that matches the surrounding, undisturbed, equivalent landscape types.

Note: LMM2 and LMM3 are to provide a minimum compensatory planting area of 0.74ha of Shrubland.

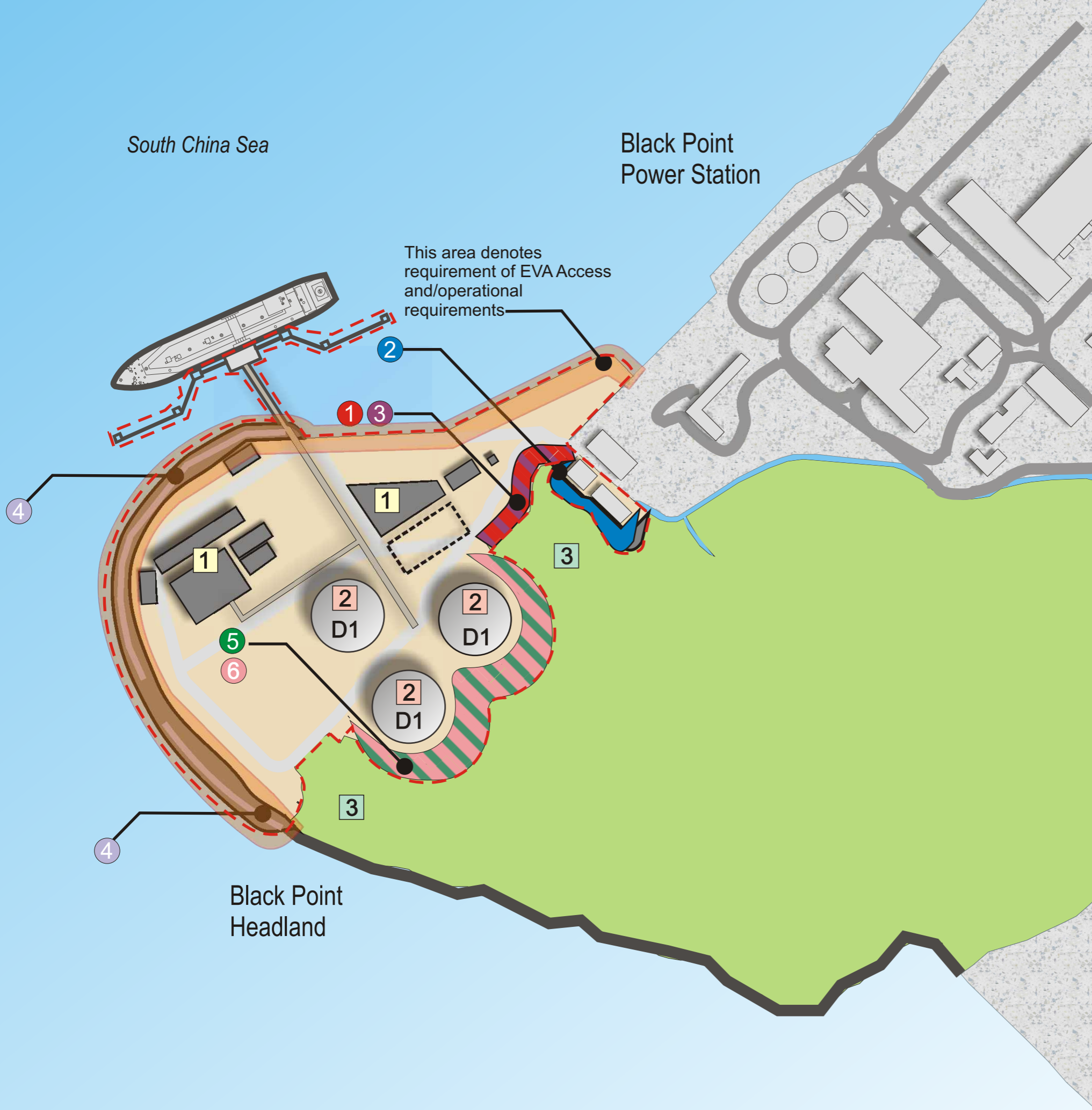
*LMM4 – Utilising natural rock for reclamation.* The reclamation areas shall utilise natural rocks for the engineered sea-walls.

*LMM5 – Cut Stabilisation.* Areas of cut to be stabilised for operational requirements. Materials and finishes of stabilisation to be selected to complement the surrounding landscape where technically feasible. This includes the addition of pigments and aggregates in the finished slope that complement the existing geology of the area.

*LMM6 – Bench Plantings.* Cut Slopes to have benches created to allow for plantings. Plantings will include Shrubs and climbers to minimise the visual impact of the slope and mitigate impact on vegetation.

*LMM7 – Early Planting Works.* Where technically feasible, new plantings are to be installed during the construction works. Due to the unknown nature of the construction timing, this mitigation is not shown on *Figure 11.13*.

*LMM8 – Site hoardings to be compatible with the surrounding environment.* Where possible site hoardings to be coloured to complement the surrounding areas. Colours such as green and light brown are recommended. As the proposed locations are not yet known this mitigation measure is not shown on *Figure 11.13*



**LANDSCAPE AND VISUAL MITIGATION MEASURES**

- 1** CULTIVATION OF AREAS COMPACTED DURING CONSTRUCTION  
Areas compacted during the construction phase that are not required during the operations phase, are to be cultivated to a depth of 300mm in accordance with the future Landscape Specification.
  - 2** SOIL STABILISATION AND EMBANKMENT PLANTING  
During the design process a soil stabilisation and embankment planting strategy should ensure that land affected by slope excavation can be replanted. Soil preparation and the selection and provision of suitable growing medium is to be completed in accordance with the relevant best practice guidelines.  
*Refer to Landscape Details 1,2,3 & 4.*
  - 3** TREE AND SHRUB PLANTING  
Planting of trees and shrubs is to be carried out in accordance with the Landscape Details and the relevant best practice guidelines. Plant densities are to be provided in future detailed design documents and are to be selected so as to achieve a finished landscape which matches the surrounding, undisturbed, equivalent landscape types.  
*Refer to Landscape Details 1, 2, 3 & 4.*
- Note: Soil stabilisation and embankment planting along with tree and shrub planting are to provide a minimum compensatory planting area of 0.74ha of Shrubland.
- 4** UTILISING NATURAL ROCK FOR RECLAMATION.  
The reclamation areas shall utilise natural rocks for the engineered sea-walls.
  - 5** CUT STABILISATION  
Areas of cut to be stabilized for operational requirements. Materials and finishes of stabilization to be selected to complement the surrounding landscape where technically feasible.
  - 6** BENCH PLANTINGS  
Cut Slopes to have benches created to allow for plantings. Plantings will include Shubs and climbers to minimise the visual impact of the slope and mitigate impact on vegetation.  
*Refer to Landscape Detail 4*
- 1** VMM1 DESIGN OF STRUCTURES  
Where possible, built structures will be utilise appropriate designs to complement the surrounding landscape. Materials and finishes will also be considered during detailed design.
  - 2** VMM2 COLOURS  
Colours for the terminal can be used to complement the surrounding area. Lighter colours such as shades of light grey and light brown may be utilised where technically feasible to reduce the visibility of the terminal.
  - 3** VMM3 PLANTINGS  
In addition to the landscape mitigation plantings proposed in Sction 11.10 of this report, appropriate new plantings will be installed where possible, to help integrate the new structures into the surrounding landscape.
  - D1** DESIGN MEASURES  
Reduce tank height to be reduced from 70mPD to 61m PD.





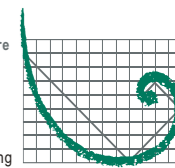
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**Fig 11.13a Conceptual Image of Completed**  
**Project at Year 10 with Mitigation**

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& Urban Design

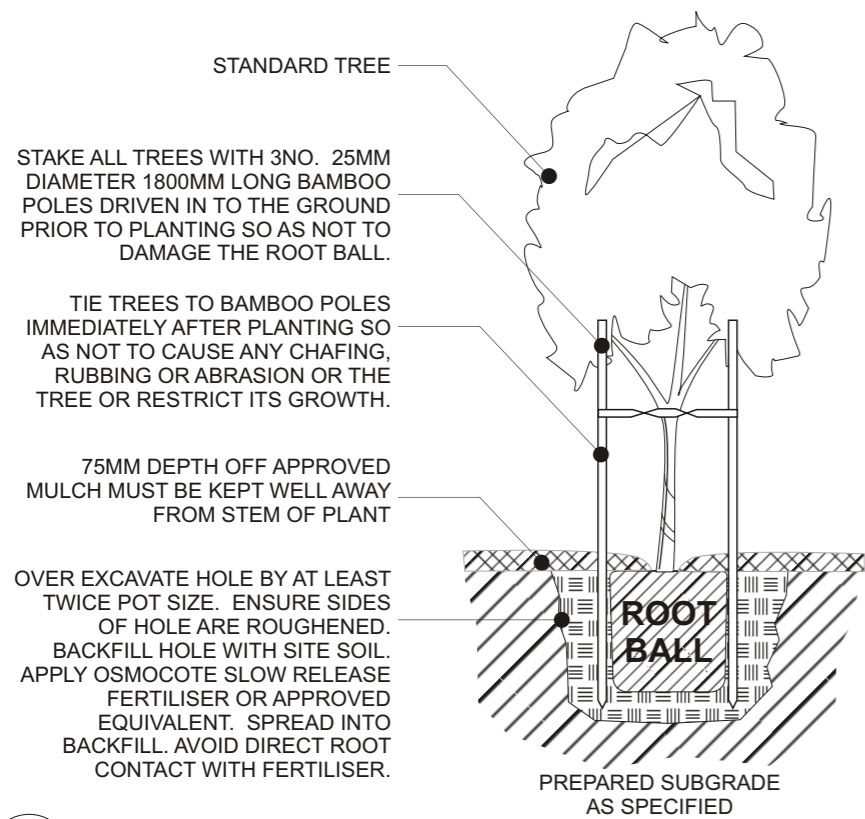
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June 2006

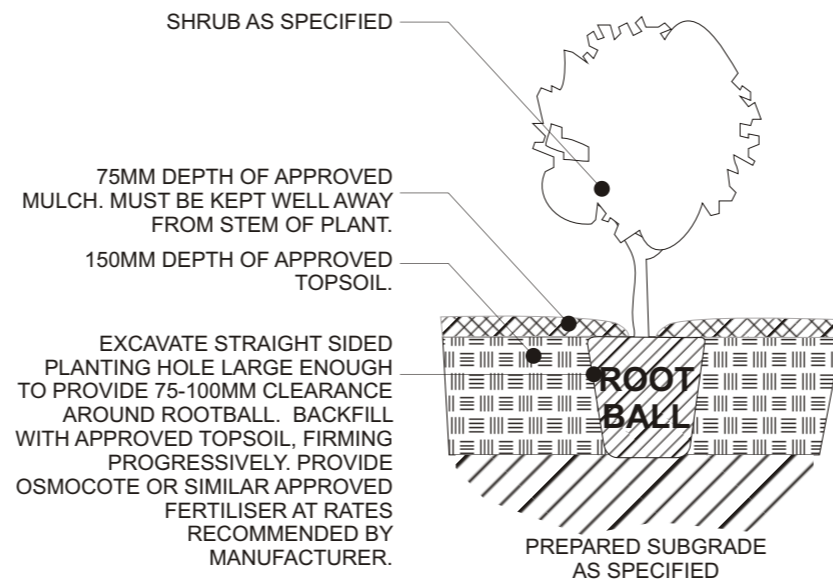
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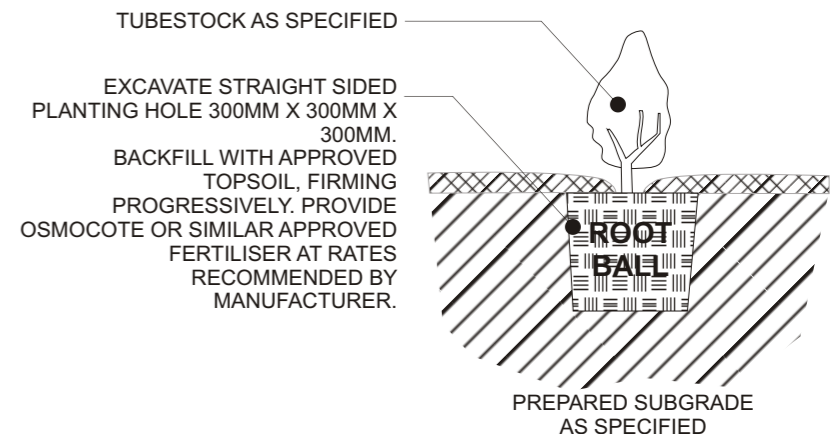
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1 ADVANCED TREE PLANTING DETAIL  
NOT TO SCALE



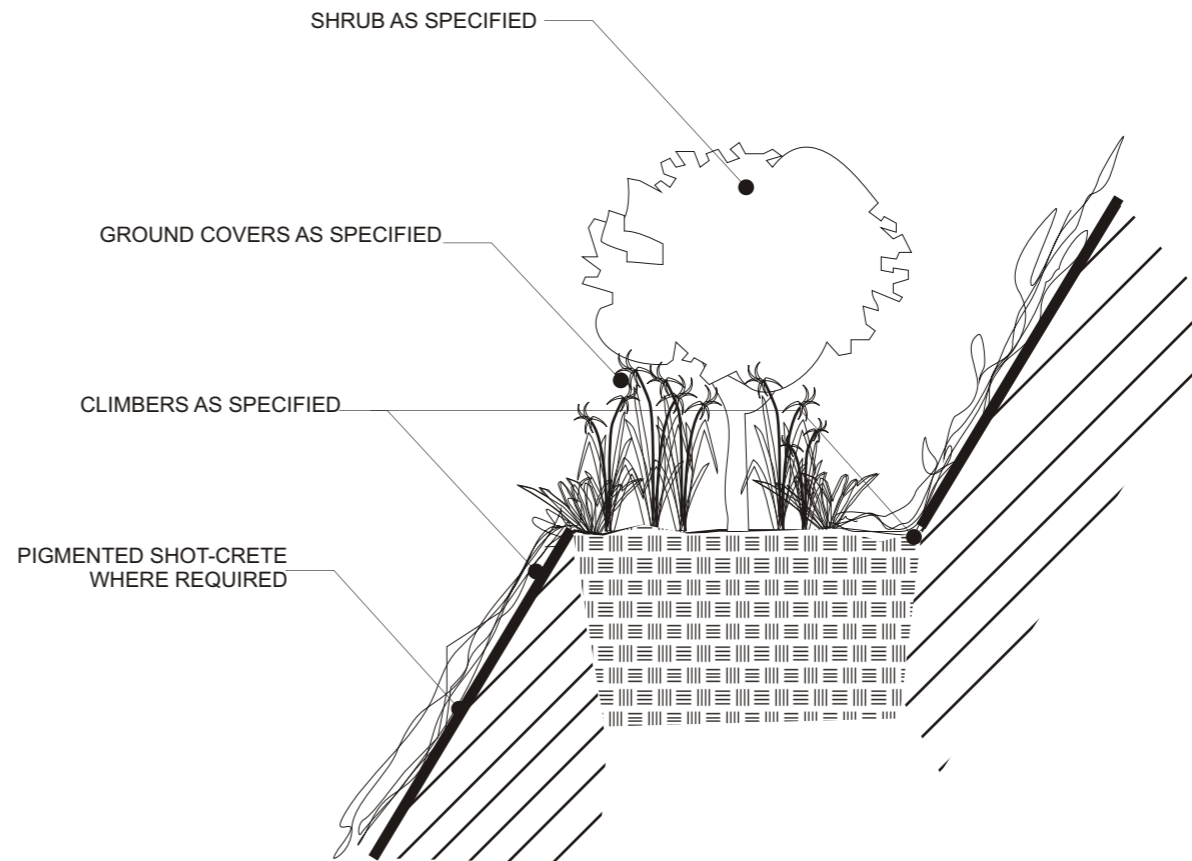
2 SHRUB PLANTING DETAIL  
NOT TO SCALE



3 TUBE PLANTING DETAIL  
NOT TO SCALE

## PLANT SCHEDULE

	DESCRIPTION / ORIGIN		
	NATIVE (N)/ EXOTIC (E)	SECONDARY WOODLAND	SHRUBLAND
<b>TREES</b>			
<i>Casuarina equisetifolia</i>	N	X	
<i>Celtis sinensis</i>	N	X	
<i>Cerbera manghas</i>	E		
<i>Ficus microcarpa</i>	N	X	X
<i>Ficus superba</i>	N	X	X
<i>Hibiscus tiliaceus</i>	N	X	
<i>Macaranga tanarius</i>	N	X	X
<i>Mallotus paniculatus</i>	N	X	X
<i>Melia azedarach</i>	N	X	
<i>Microcos paniculata</i>	N	X	
<i>Sterculia lanceolata</i>	N	X	
<i>Thespesia populnea</i>	N		X
<b>SHRUBS</b>			
<i>Bridelia tomentosa</i>	N	X	
<i>Cratogeomys cochinchinensis</i>	N		X
<i>Gardenia jasminoides</i>	N	X	X
<i>Ilex asprella</i>	N	X	X
<i>Lantana camara</i>	E	X	X
<i>Ligustrum sinense</i>	N	X	X
<i>Melastoma candidum</i>	N	X	X
<i>Melastoma sanguineum</i>	N	X	X
<i>Pandanus tectorius</i>	N		X
<i>Phyllanthus cochinchinensis</i>	N	X	X
<i>Phoenix hanceana</i>	N		X
<i>Rhaphiolepis indica</i>	N	X	X
<i>Rhodomyrtus tomentosa</i>	N	X	X
<i>Sapium discolor</i>	N	X	
<i>Sapium sebiferum</i>	N	X	
<i>Scaevola sericea</i>	N		
<i>Schefflera octophylla</i>	N	X	X
<b>CLIMBING PLANTS</b>			
<i>Embelia laeta</i>	N	X	X
<i>Ipomoea brasiliensis</i>	N		
<i>Wedelia chinensis</i>	N		



4 SLOPE PLANTING DETAIL  
NOT TO SCALE

Fig 11.14 BLACK POINT Landscape Mitigation Details

Table 11.5 Mitigated Landscape Impacts

LR	Un-Mitigated Landscape Impact		Recommended Mitigation	Mitigated Impacts		
	Construction	Operation		Construction	Operation Day 1	Operation Year 10
1 Plantation	Negligible	Negligible	Nil	Negligible	Negligible	Negligible
2 Shrubland	Moderate-Significant	Moderate-Significant	LMM 1-3,5,6	Moderate-Significant	Moderate-Significant	Moderate
3 Shrubby Grassland	Negligible	Negligible	Nil	Negligible	Negligible	Negligible
4 Stream/Channel	Moderate	Moderate	Nil	Moderate	Moderate	Moderate
5 Developed Area	Slight	Slight	Nil	Slight	Negligible	Negligible
6 Rocky Shoreline	Significant	Significant	LMM 4	Significant	Slight/Moderate	Slight/Moderate
7 Power Station Edge	Slight/Moderate	Slight/Moderate	Nil	Slight/Moderate	Negligible	Negligible

Table 11.5 describes the predicted un-mitigated impacts on the landscape resources of Black Point in both construction and operation phases. It also shows the predicted mitigated impacts during construction, day 1 of operation and year 10 of operation.

No mitigation measures are proposed for LR's 1 and 3 as there will be no impact on these resources. No mitigation measures are proposed for LR's 5 and 7 as these resources will be replaced with similar resources as a result of the new Terminal.

#### 11.10.1 *Effectiveness of Landscape Resource Mitigation Measures*

Due to the operational requirements of the LNG terminal, some landscape impacts cannot be mitigated. The trees that are to be removed will be compensated by new plantings in other parts of the headland. This will help restore some of the more degraded areas to a more natural landscape.

#### 11.11 RESIDUAL LANDSCAPE IMPACTS

The residual landscape impacts are those that will exist after all mitigation measures have been implemented. *Figure 11.15* shows the residual landscape impacts and they are quantified in *Table 11.6*

**Table 11.6** *Residual Landscape Impacts*

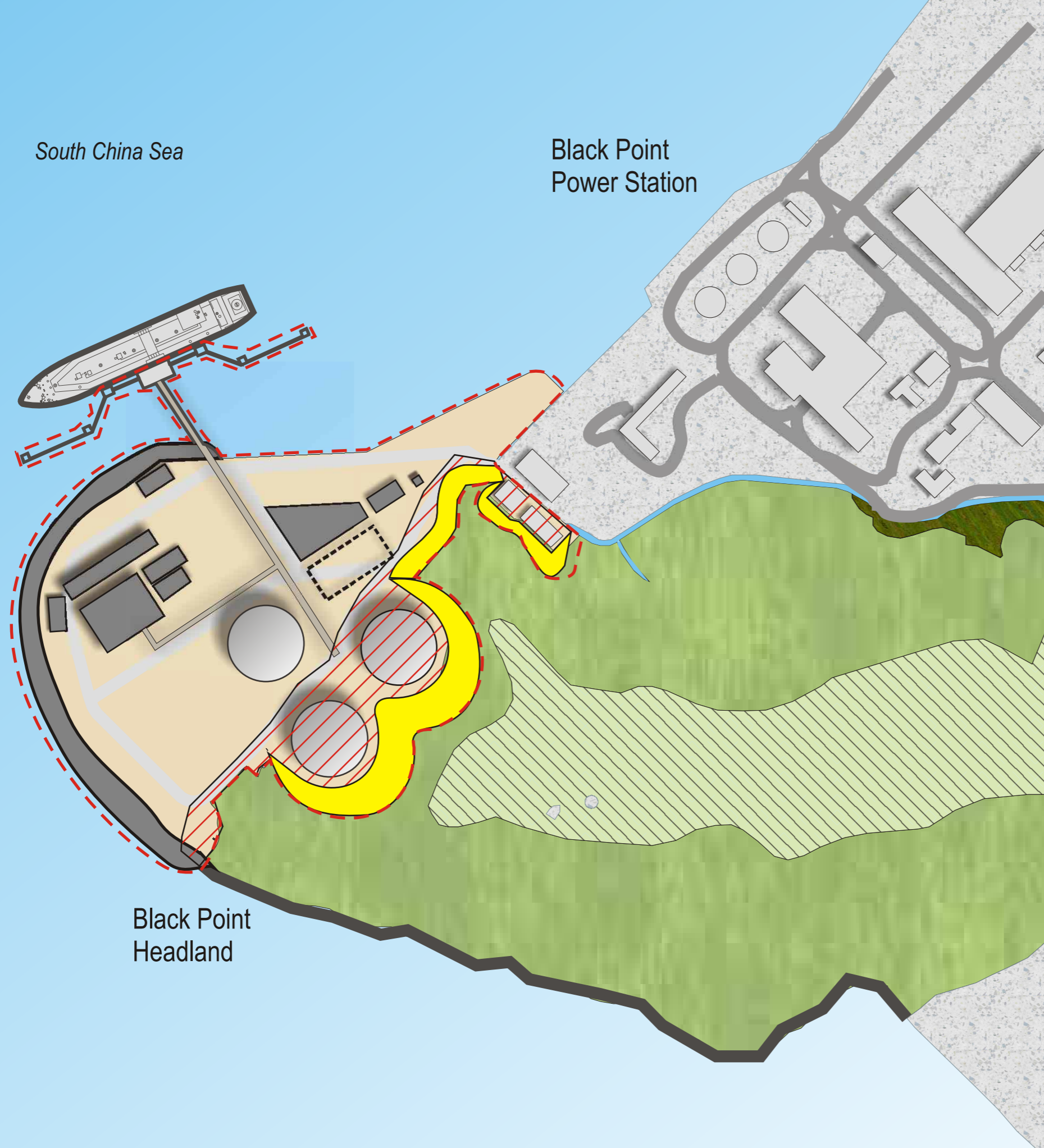
LCU	Description	Area / Length (2005)	Area Affected by Proposed Development	Mitigated Area	Residual Impact
1	Plantation	4.3 ha	Nil	Nil	Nil
2	Shrubland	46.6 ha	4.9 ha	0.74 ha	4.16 ha
3	Shrubby Grassland	18.2 ha	Nil	Nil	Nil
4	Stream/Channel	0.7 ha	0.04 ha	Nil	0.04 ha
5	Developed Area	43.6 ha	0.8 ha	Nil	0.8 ha
6	Rocky Shoreline	1.25 km	0.6 km	Nil	0.6 km
7	Power Station Edge	0.6 km	0.08 km	Nil	0.08 km

#### 11.11.1 *Residual Impact Summary*










There will be a residual impact of approximately 4.2 ha on the Shrubland area.

The impact on the Rocky Shoreline will be partially mitigated by the use of natural rocks in the reclamation construction. The primary Emergency Access to the new Terminal is from the ocean, therefore landscape measures such as bunds, planters and associated vegetation cannot be employed along the new ocean edge.


The residual impacts on the Stream/Channel, Developed Area, and the Powers Station Edge will be not be mitigated due to the construction of the new terminal. As the Terminal will also be a Developed Area, the impacts on these LR's will be negligible.



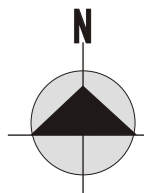
**LEGEND**

-  Plantation
-  Shrubland
-  Shrubby Grassland
-  Stream /Channel
-  Developed Area
-  Rocky Shoreline
-  Extent of construction
-  Mitigated Areas
-  Residual Impact

Scale 1:5000 (A3)



0 100 500M



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**Fig 11.15 Residual Impacts**



### 11.11.2 *Landscape Impact Conclusion*

The project will affect the Landscape Resources principally as a result of the excavation required for the terminal. However, from the assessment it is concluded that the Landscape Impacts will be acceptable with the implementation of the mitigation measures.

### 11.11.3 *Mitigation Installation and Maintenance Responsibilities*

The project proponent will be ultimately responsible for the installation and maintenance of the mitigation measures.

A specialist Landscape Sub-Contractor should be employed by the Contractor(s) for the implementation of landscape construction works and subsequent maintenance operations during a 24 month establishment period.

### 11.12 VISUAL IMPACT ASSESSMENT

In undertaking the visual assessment, the following tasks were undertaken:

1. **Define the viewshed that would be potentially impacted and map the areas of visual impact.** This section describes the viewshed of the LNG Terminal which is based on both the planning guidelines and the parameters of human vision. This section then utilises Geographical Information System (GIS) software to determine areas that can potentially see the LNG Terminal. This GIS analysis is based solely on topography and does not take into account the screening potential of vegetation, which further reduces the actual viewshed. GIS analysis also maps the visibility of the LNG Terminal from roads and houses.
2. **Discuss atmospheric conditions.** This section discusses the mitigating effects of weather, particularly sea haze and rainfall.
3. **Identify and assess indicative viewpoints as a means of assessing the visual impact on the broader landscape.** This section describes a number of key Visually Sensitive Receiver (VSR) viewpoints around the LNG terminal which have been selected as indicative of the range of views from accessible locations within the viewshed. Several viewpoints will also have photomontages or visual simulations prepared which show the existing landscape and the landscape with the proposed LNG Terminal site. The VSRs will be discussed to assess the visual compatibility and severity of any obstructions or visual impacts.
4. **Discuss visual mitigation measures.** This section examines measures incorporated into the design that will reduce potential visual impacts such as, positioning of structures, planting of vegetation and recommendations for material and finishes. These measures will also help improve the overall amenity of the development. Residual impacts will also be discussed.
5. **Assess night lighting and glare impacts.** This section examines the potential glare and night lighting impacts associated with the proposal.

### 11.12.1 *Viewshed Determination & Areas Of Potential Visual Impact*

The baseline for a visual assessment is an understanding of the existing visual qualities within the region that can be visually affected by a proposed development. This area is referred to as the “viewshed” or sometimes the *zone of visual influence (ZVI)*, or the “visual envelope”. All terms refer to the same thing, however this report will use the term “viewshed”.

Defining an appropriate viewshed is the starting point to understand the visual impacts of a development as the area of the viewshed will vary depending on the nature and scale of the proposed development. The larger a development the greater the viewshed as it may be visually apparent for a greater distance. Once the viewshed is established, locations can be identified within the viewshed that are either particularly sensitive or indicative of the visual impact for a number of locations. In some circumstances, viewpoints may be identified beyond the viewshed to recognise the visual impact on locations of particularly high sensitivity.

As the viewer moves further away from the LNG Terminal, the visual impact decreases until the LNG terminal is no longer visible. However, before the point of invisibility is reached, the LNG Terminal has reduced in scale such that it no longer has a significant visual impact on the landscape. In most landscapes, especially those which have some degree of human intervention, the limit of the viewshed is defined as that point at which the LNG Terminal would have an insignificant effect on the view.

### 11.12.2 *Types of Viewshed*

In recognising that the viewshed is not the limit of visibility, but rather the extent to which an LNG Terminal would have an insignificant visual impact on the landscape, then the extent of a viewshed differs in the context of different landscapes.

A viewshed in a man-modified landscape is different to a viewshed in a pristine landscape or landscapes where there are no apparent signs of human influence. This is because in landscapes that appear ‘natural’ or pristine, a man made element such as an LNG Terminal, can visually influence the landscape for as long as a viewer can discern that newly introduced element. A man made element in a pristine landscape irrevocably changes a pristine landscape from natural to man modified. Therefore, viewsheds in pristine areas are extended to the limit of human visibility.

However in man modified landscapes, in which there are many other existing built forms or modifications to the landscape, the viewshed extends to that distance at which the LNG Terminal become a minor element in the landscape to all but the most sensitive of viewers. The LNG Terminal may still be visible beyond this viewshed, however it is considered that beyond this viewshed the visual impact will be insignificant.

The viewshed then is that area that is most likely to be visually impacted and once again, it is stressed that particularly sensitive locations beyond the viewshed may still need to be reviewed.

### 11.12.3 Viewshed Determination

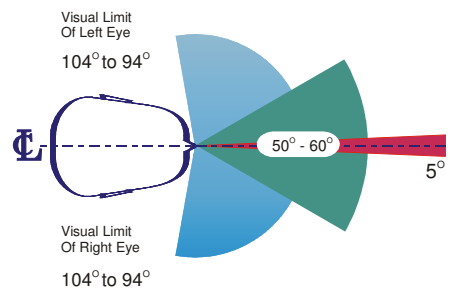
The visual impact of a development can be quantified by reference to the degree of influence on a person's field of vision. The following diagrams illustrate the typical parameters of human vision and are based on anthropometric data (*Human Dimension & Interior Space – A Source Book of Design Reference Standards*, Julius Panero and Martin Zelnik, The Architectural Press Ltd. London, 1979). This data provides a basis for assessing and interpreting the impact of a development by comparing the extent to which the development would intrude into the central field of vision (both horizontally and vertically).

#### *Horizontal cone of view*

The central field of vision for most people covers an angle of between 50° and 60°. Within this angle, both eyes observe an object simultaneously. This creates a central field of greater magnitude than that possible by each eye separately. This central field of vision is termed the 'binocular field' and within this field images are sharp, depth perception occurs and colour discrimination is possible.

These physical parameters are illustrated in *Figure 11.16* opposite.

The visual impact of a development will vary according to the proportion in which a development impacts on the central field of vision. Developments, which take up less than 5% of the central binocular field, are usually insignificant in most landscapes (5% of 50° = 2.5°).



**Figure 11.16** *Horizontal Field of View*

In assessing the visual impact of the proposed LNG Terminal it is assumed that the largest horizontal component is the entire terminal, which is approximately 400m wide.

Table 11.7 Visual Impact based on the Horizontal Field of View

Horizontal Field of View	Impact	Distance from an observer to a 400m wide facility
<2.5° of view	Insignificant The development will take up less than 5% of the central field of view. The development, unless particularly conspicuous against the background, will not intrude significantly into the view. The extent of the vertical angle will also affect the visual impact. Potentially noticeable	>9,000m
2.5° – 30° of view	The development may be noticeable and its degree of visual intrusion will depend greatly on its ability to blend in with its surroundings. Potentially visually dominant	700 m – 9,000m
>30° of view	Developments that fill more than 50 percent of the central field of vision will always be noticed and only sympathetic treatments will mitigate visual effects.	< 700m

#### Vertical Field of View

A similar analysis can be undertaken based upon the vertical line of sight for human vision. As can be seen in the Figure opposite the typical line of sight is considered horizontal or 0°. A person's natural or normal line of sight is normally a 10° cone of view below the horizontal and, if sitting, approximately 15°.

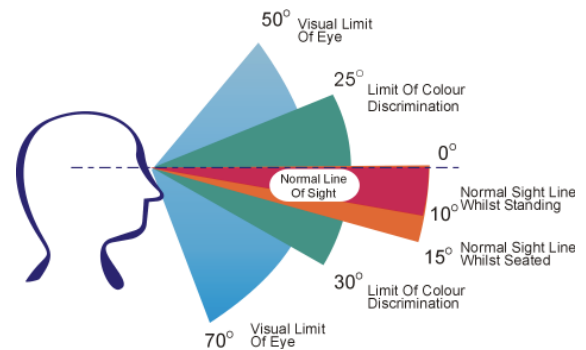


Figure 11.17 Vertical Field of View

Objects, which take up 5% of this cone of view (5% of 10° = 0.5°) would only take up a small proportion of the vertical field of view, and are only visible when one focuses on them directly. Objects that take up such a small proportion of the vertical view cone are not dominant, nor do they create a significant change to the existing environment when such short objects are placed within a disturbed or man-modified landscape. They may however be more noticeable in a pristine environment.

The table below shows the relationship between impact and the proportion that the development occupies within the vertical line of sight.

Table 11.8 *Extent of impact based on distance to tank*

Vertical Line of Sight	Impact	Distance from an observer to a 70m LNG storage tank
< 0.5° of vertical angle	Insignificant A thin line in the landscape.	>6,000m
0.5° – 2.5° of vertical angle	Potentially noticeable The degree of visual intrusion will depend on the development's ability to blend in with the surroundings.	1,260 – 6,000m
> 2.5° of vertical angle	Visually evident Usually visible, however the degree of visual intrusion will depend of the width of the object and its placement within the landscape.	< 1,260m

These calculations suggest distances at which the magnitude of visual impact of the LNG facility is reduced with distance. At distances greater than 6000m, a fully visible LNG storage tank would be an insignificant element within the landscape.

These calculations seem closer to the observed distances at which levels of impact seem to change. It is stressed that these ranges are a guide only.

An apparent discrepancy will occur when analysing horizontal and vertical parameters separately. Generally, the more conservative figures form the basis for the assessment. In this example it is proposed to extend the viewshed to 9,000m, although it could be argued that a lesser extent would also be valid.

For the proposed LNG Terminal it is proposed that the following distances are used for the Viewshed analysis.

Table 11.9 *Viewshed and Degrees of Visual Influence*

Impact	Distance from an observer to the LNG Terminal
Insignificant A thin line in the landscape, both horizontally and vertically	>9,000m
Potentially noticeable The degree of visual intrusion will depend on the development's ability to blend in with the surroundings.	1,260 – 9,000m
Visually evident Usually visible, however the degree of visual intrusion will depend on the degree to which the development will blend into the landscape.	< 1,260m

It must be noted that the areas that define the viewshed are a guide only. Simply because a viewer moves from 1260m from the Terminal to 1270m, this will not result in the impact moving from 'Visually Evident' to 'Potentially Noticeable'. Similarly just because a viewpoint is within either of these zones does not indicate that a view within the viewshed will experience an impact.

Other factors such as terrain, vegetation and human-made elements in the landscape can reduce or even remove visual impacts within the viewshed.

#### 11.12.4 *Areas of potential visual impact*

A GIS analysis can determine those areas that can potentially be visually impacted by the development. Such analysis is based on topography only, and shows those areas that would be screened by intervening hills etc. It does not account intervening vegetation or buildings, nor does it take into account small variations in topography, such as road cuttings. Therefore it is quite a conservative assessment of those areas that may be potentially able to view the LNG Terminal and especially the storage tanks.

Figure 11.18 shows an analysis of those areas within a 9km viewshed that may be able to see any part of any of the proposed storage tanks.

The viewshed is divided into two zones. The zone of greatest potential visual impact are those areas that lie within 1260m of the LNG Terminal. Since the terminal is shielded by the Black Point Headland Hill, nearly all of this area (shown in green) is on the ocean side of the terminal.

**Table 11.10** *Analysis of the areas that lie within the viewshed where any part of the LNG tanks would be visible*

	Visible from the ocean	Not visible from the ocean	Visible from the land	Not visible from the land	TOTALS
Areas within 1260m of the LNG Terminal	5.19km <sup>2</sup>	0.69km <sup>2</sup>	1.70km <sup>2</sup>	1.07km <sup>2</sup>	8.65km <sup>2</sup>
Areas between 1.26 and 9km of the LNG Terminal	227.94km <sup>2</sup>	31.76km <sup>2</sup>	8.62km <sup>2</sup>	30.61km <sup>2</sup>	300.82km <sup>2</sup>
<b>TOTALS</b>	<b>233.13km<sup>2</sup></b>	<b>32.45km<sup>2</sup></b>	<b>10.32km<sup>2</sup></b>	<b>31.68km<sup>2</sup></b>	<b>309.47km<sup>2</sup></b>

This analysis shows that the main views to the entire LNG tank will be from the water. Land based viewing locations are only available within 3.33% of the 310km<sup>2</sup> viewshed.

A similar analysis showing those areas from which the entire LNG tank would be visible was conducted to identify those areas of greatest potential impact. This analysis showed far less impacts than in the preceding analysis since it precludes areas that may be able to see a proportion but not all of the LNG tank.

Figure 11.19 shows the viewshed where an entire tank is visible. Again, the viewshed is mostly restricted to the ocean areas.

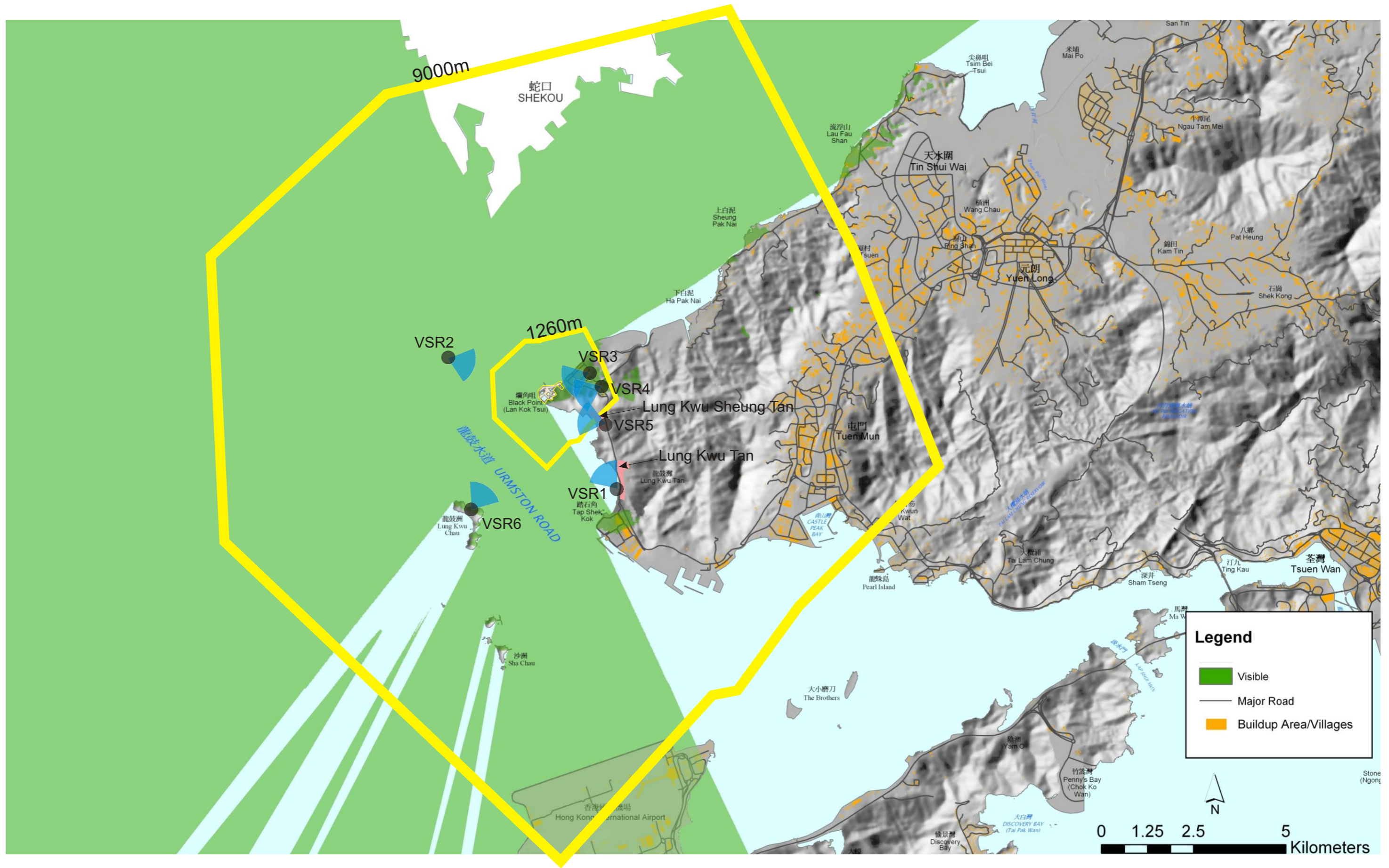
**Table 11.11** *Analysis of the areas that lie within the viewshed where an entire tank of the LNG terminal would be visible*

	Visible from the ocean	Not visible from the ocean	Visible from the land	Not visible from the land	TOTALS
Areas within 1260m of the LNG Terminal	6.18km <sup>2</sup>	0.73km <sup>2</sup>	1.37km <sup>2</sup>	0.37km <sup>2</sup>	8.65km <sup>2</sup>
Areas between 1.26 and 9km of the LNG Terminal	211.96km <sup>2</sup>	40.05km <sup>2</sup>	9.35km <sup>2</sup>	39.46km <sup>2</sup>	300.82km <sup>2</sup>
<b>TOTALS</b>	<b>218.14km<sup>2</sup></b>	<b>40.78km<sup>2</sup></b>	<b>10.72km<sup>2</sup></b>	<b>39.83km<sup>2</sup></b>	<b>309.47km<sup>2</sup></b>

This analysis demonstrates that the majority of the area that may be potentially impacted lies on the ocean. Land based vantage points are very limited and only represent 3.5% of the total viewshed of 309km<sup>2</sup>.

The next section of the visual analysis will select viewpoint locations on land that lie within those areas that can potentially view the proposed LNG terminal. Those areas are generally restricted to coastlines, where intervening topography cannot screen views, and along ridges in the higher areas that also have views towards Black Point. As there will also be some marine VSR's affected, these are also assessed.

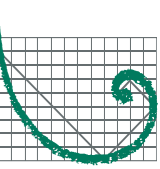




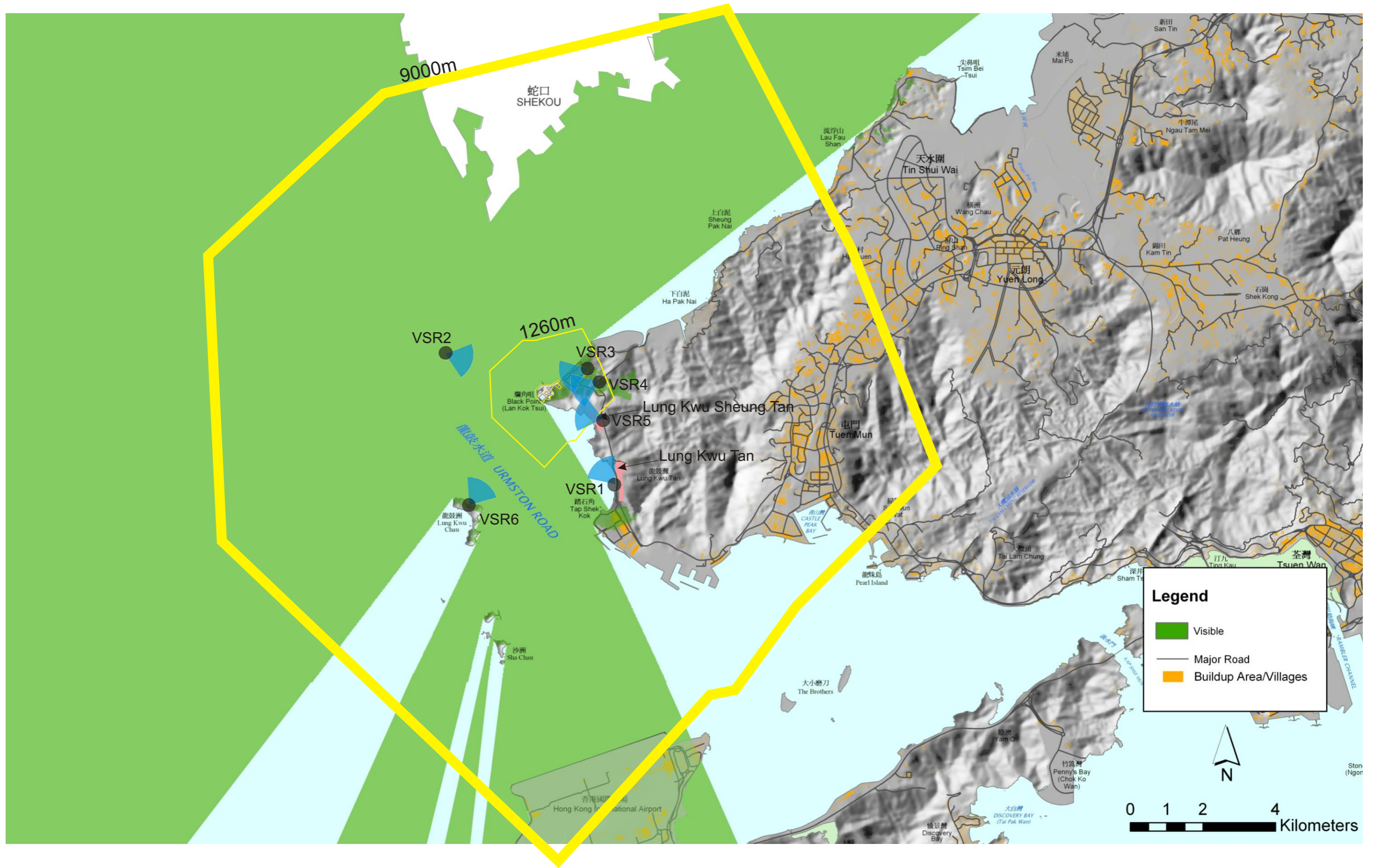
**BLACK POINT**  
**Fig 11.18 Any Part of Terminal Visible**

Landscape Architecture  
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 Taikoo Place  
 Island East, Hong Kong

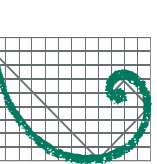
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**BLACK POINT**  
**Fig 11.19 Entire Terminal Visible**



### 11.12.5 *Atmospheric Factors Which Will Affect Visual Impact*

Many climatic conditions result in changes to visibility. For example, sea haze, rainfall and other atmospheric conditions will alter the visibility of the LNG Terminal. The diminution of visual clarity brought about by atmospheric conditions increases with distance. As much of the areas that can see the development are located on or across the sea, the impact of sea haze and other atmospheric conditions will reduce visibility.

#### *Sea Haze*

Sea haze is a climatic condition along coastlines that can reduce visibility even on days when the weather is fine. Wind which blows across the ocean can cause a sea haze, limiting views to the site and the proposed LNG Terminal from surrounding areas. Sea haze is unlikely to have much impact on the visibility of the LNG Terminal when viewed from close proximity. (i.e. less than 1.2km). When the same features are viewed from greater distances within the viewshed the effect of sea haze will greatly reduce visibility and any potential visual impact. This was illustrated in 2005 when ERM was first asked to assess Black Point. In the first six months of 2005 there were very few days of sufficiently clear visibility to undertake a photographic survey from vantage points around the site.

#### *Rainfall*

The effect that rainfall has on visibility can be measured in two ways. Firstly the event of falling rain reduces visibility as the water droplets obscure vision. This varies greatly depending on the heaviness of the precipitation, but even light rain obscures distant objects greatly.

Secondly, the event of rain, particularly sustained rain periods, reduces visitor numbers. Therefore, the visual impact is reduced on those days as less viewers are visiting the area and looking at the site.

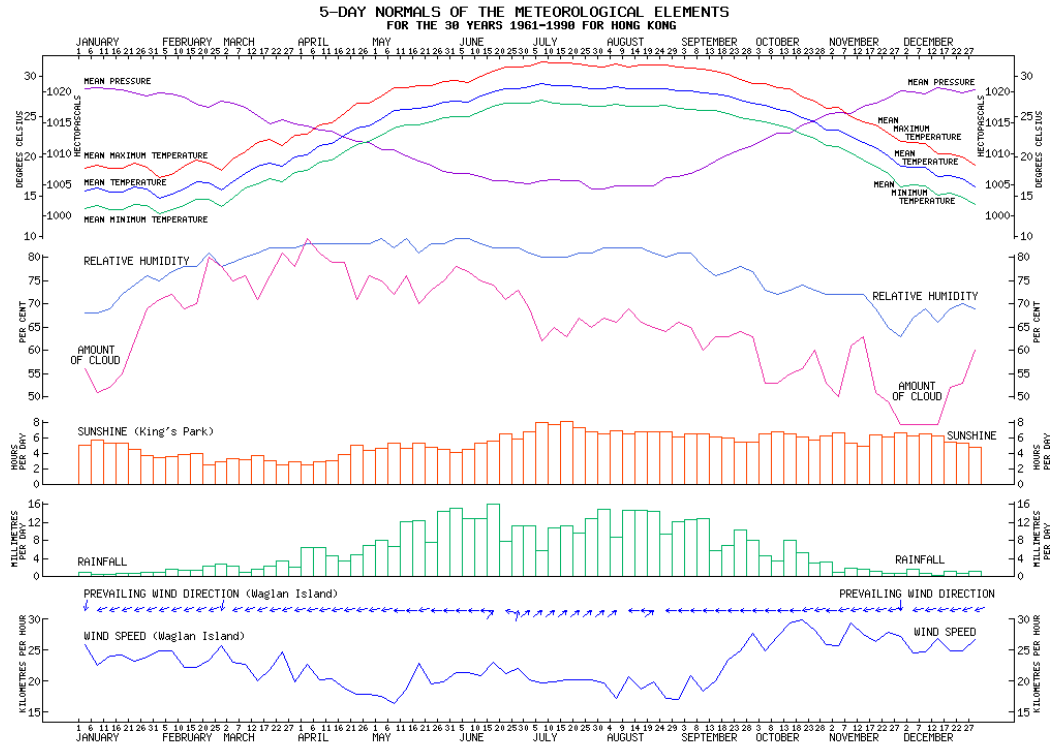


Figure 11.20 Hong Kong Weather. Source: Hong Kong Observatory.

Figure 11.20 shows that during the wetter months, particularly from May through September, Hong Kong receives on average approximately 10 millimetres per day. Thus during these rain periods, visibility is reduced.

11.12.6 Assessment Scenarios

Whilst the above section 11.12.5 describes some of the climatic conditions that reduce the visibility of the LNG Terminal, the following assessment will be based on a worst case scenario that assumes perfectly clear viewing conditions. Mitigation measures will then be proposed reduce these impacts.

11.12.7 Baseline Visual Character

The area within the viewshed is of varying visual character and quality. The dominant features that define the visual character are:

The hill slopes of Castle Peak and the surrounding area. These slopes are characterised by a mix of vegetated areas and rocky outcrops;

The coastal edges which vary between the rocky shoreline to the sandy beaches further to the east;

The ocean areas;

The small villages areas such as Lung Kwu Tan, and;

The large industrial facilities such as Castle Peak Power Station, The Cement Plant and the existing Black Point Power Station.

These elements create a visual character that is appealing but has been heavily modified in certain areas.

### 11.13 VSR ASSESSMENT

There are a number of factors that must be considered when carrying out the visual impact assessment on the VSR's.

#### *VSR Sensitivity*

The first set of criteria relate to the sensitivity of the VSR's. They include:

- Value and quality of existing views;
- Availability and amenity of alternative views;
- Type and estimated number of receiver population;
- Duration of frequency of view; and
- Degree of visibility.

The views available to the identified VSRs are rated in accordance with their sensitivity to change using high, medium or low and are defined as follows:

- *High* –
  - i. The nature of the viewer groups expect a high degree of control over their immediate environment, (eg people residing in their homes); and
  - ii. The viewer groups are in proximity to the Project. This may include viewers aboard recreational marine vessels.
- *Medium* -
  - i. The nature of the viewer groups expect a medium degree of control over their immediate environment, (e.g. drivers and passengers in vehicles);
- *Low* –
  - i. The nature of the viewer groups do not expect a high degree of control over their immediate environment, (eg people at their place of employment or temporarily in attendance at the VSR location).

#### *Magnitude of Change*

This set of criteria is related to the specific details of the proposal and how it relates to the existing landscape and the visible magnitude of change it will cause.

The criteria to be assessed are:

- Compatibility of the project with the surrounding landscape;
- Scale of the development;
- Reversibility of change;
- Viewing distance;
- Potential blockage of view; and
- Duration of impact under construction and operation phases.

The magnitude of change to a view is rated as negligible, small, intermediate or large and are defined as follows:

- *Large*: major change in view.
- *Intermediate*: moderate change in view.
- *Small*: minor change in view.
- *Negligible*: no discernible change in view.

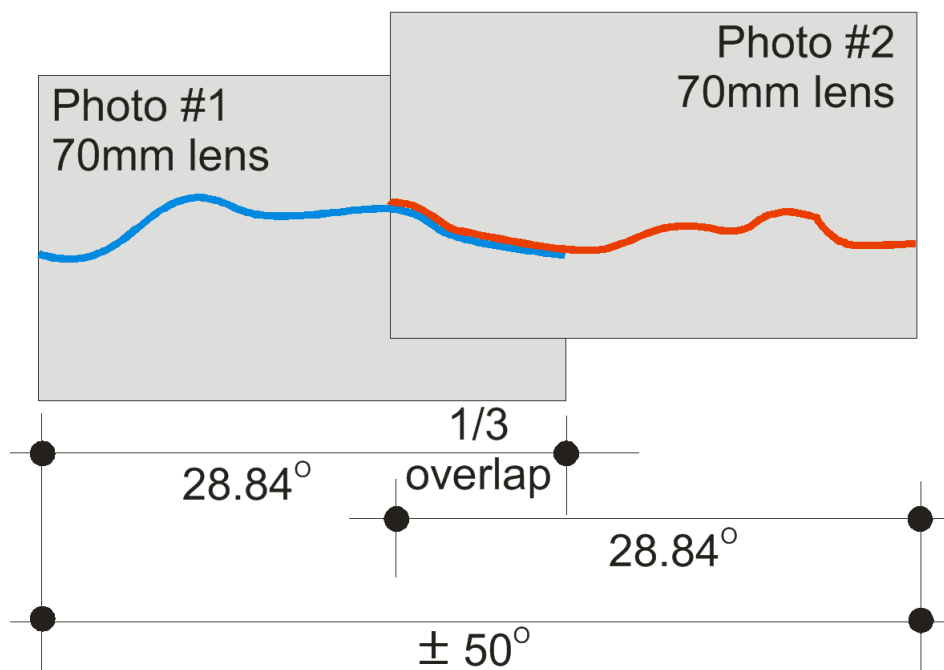
The degree of visual impact or significance threshold is rated in a similar fashion to the landscape impact, ie significant, moderate, slight and negligible. The impacts may be beneficial or adverse, however with this project, it is assumed that all visual impacts will be adverse.

Therefore, the visual impact is a product of the magnitude of change to the existing baseline conditions, the landscape context and the sensitivities of VSR's. The significance threshold of visual impact is rated for the construction phase and for Day 1 and Year 10 of the operation phase as described in *Table 11.18*

### 11.13.1 Photomontage Preparation

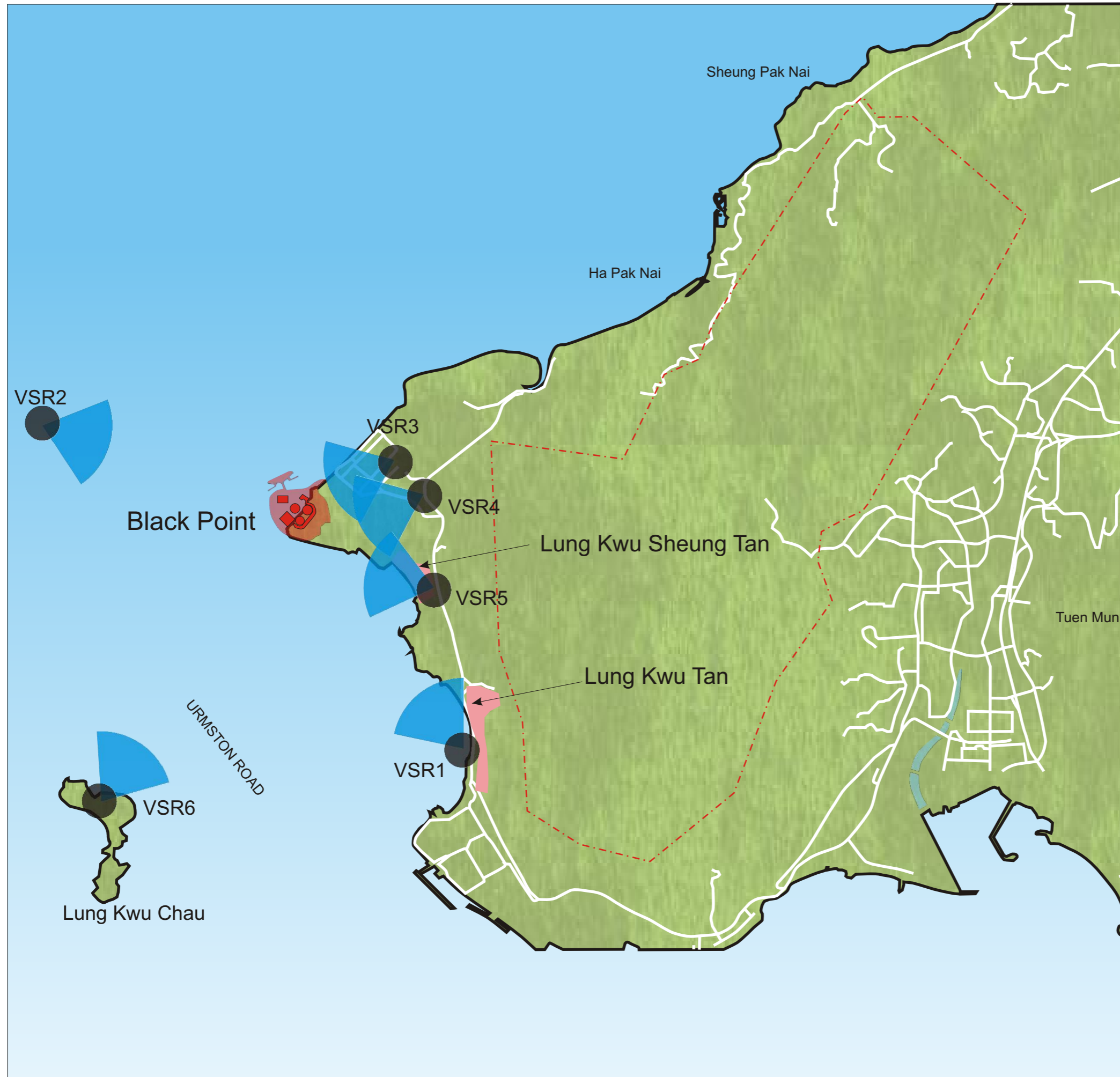
The visual assessments are also partly based on photomontages, which show the view with and without the terminal.

Photographs that form the base of the photomontages are taken with a 70mm Nikon lens on a 35mm film single lens reflex camera. A 70mm lens has a picture angle of  $34.34^\circ$  and a horizontal angle of view of  $28.84^\circ$ . ([http://www.europepress.com/lenses/nikon\\_standard\\_zoom.htm](http://www.europepress.com/lenses/nikon_standard_zoom.htm)). When two photographs taken with a 70mm lens are overlapped approximately  $1/3$ , the resultant image has a picture angle of approximately  $50^\circ$ , which is very similar to the central cone of view of human vision.





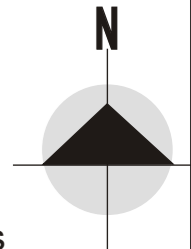
**Figure 11.21** Two photographs overlapped  $1/3$  to create an image approximately the same as the central cone of view of human vision

As discussed above, the central field of human vision is approximately  $50^\circ$  -  $60^\circ$ . Two photographs taken with a 70mm lens with approximately  $1/3$  overlap best show this static view. A 50mm lens (picture angle  $48.45^\circ$ , horizontal field of view  $39.59^\circ$ ) is often used for visual assessments as it is called a 'normal lens' because it produces roughly the same picture angle as the human eye (about  $50^\circ$ ). However, the 70mm lens slightly increases the apparent size of objects in the middle and far distance and hence increases the apparent size of the terminal in the photomontages. For this reason this  $1/3$  overlap technique has been adopted for the photomontages preparation within this report.



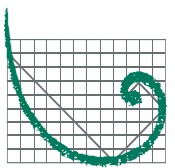
**LEGEND**

-  Major roads
-  VSR



**BLACK POINT**  
**Fig 11.22 VSR**  
**LOCATIONS**

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 & Urban Design  
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 979 Kings Road  
 Taikoo Place  
 Island East, Hong Kong



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### 11.14 VISUAL IMPACT ASSESSMENT FROM VISUALLY SENSITIVE RECEIVERS (VSR)

Figure 11.22 shows the indicative viewpoints from publicly accessible locations, which have been selected for analysis.

These viewpoints have been selected to represent the range of views from accessible locations. The selected viewpoints are within publicly accessible areas, which are:

- *Public Areas* (VSR1 and VSR6);
- *Road Network* (VSR3, 4 and 5); these include views seen by visitors and the local community when traversing through along roads; The proposed Shenzhen Western Corridor/Deep Bay link may potentially have glimpses of the development, however it is outside of the viewshed, therefore the visual impacts it assumed to be negligible.
- *Ocean viewpoints* (VSR 2); these include views seen by people on ferries and local boats;
- *Villages*; there are no views from villages. The proposed LNG Terminal will not be visible from the village areas of Lung Kwu Sheung Tan and Lung Kwu Tan as the topography of the area completely screens views. This is visible in Figures 11.18 and 11.19, where the seen area of the Terminal does not cover any of the village areas. Similarly, whilst the GIS analysis has shown that parts of Sheung Pak Nai may have glimpses of the development, site visits to the area have shown the terminal will not be visible.

### 11.15 VIEWS FROM PUBLIC AREAS

The two viewpoints below were selected to represent impacts on Visually Sensitive Receivers in public areas:

VSR1      Lung Tsai Beach

VSR6      Lung Kwu Chau

### 11.16 VIEWS FROM ROAD NETWORK

The local road network provides opportunities to view the LNG Terminal from publicly accessible locations. Indicative viewpoints have been selected from the surrounding road network and have generally been chosen at locations where views are uninterrupted by roadside vegetation and road cuttings etc. The analysed viewpoints are:

- VSR 3 Above Black Point
- VSR 4 Elevated view from Lung Mun Road
- VSR 5 Lung Mun Road (Lower View)

### 11.17 VIEWS FROM THE OCEAN

The ocean also provides opportunities for views of the proposed LNG Terminal. The GIS analysis has clearly shown that the greatest potential viewing locations are from the surrounding ocean, not from the land.

To simulate the potential impacts on ocean VSR's a photomontage has been prepared from the eastern edge of the ferry lane. The analysed viewpoint is VSR 2, the Ferry Lane.

#### 11.17.1 VSR1 – View from Lung Tsai Beach

Lung Tsai Beach is located approximately 2,940 m south east of the proposed terminal. This VSR is a public area.

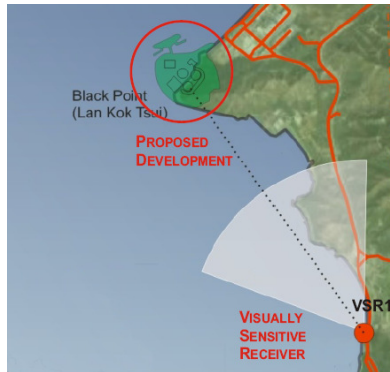


Figure 11.23 VSR1 Lung Tsai Beach

Photomontage 1 on the following page shows that views from much of Lung Tsai beach are screened by Black Point Headland. This viewpoint was selected as it represents a worst-case scenario since from this angle a small part of the terminal (the vents) will be visible.

Table 11.12 Sensitivity / Quality of VSR

Value and quality of view	High
Visitor numbers	Medium
Availability and amenity of alternative views	High
Duration and frequency of views to facility	Short and Variable
Degree of visibility	Low
Sensitivity/Quality of VSR	Medium

Table 11.12a Magnitude of Change

	Construction	Operation
Compatibility with surrounding landscape	Low	Low
Potential blockage of view	Low	Low
Distance to Terminal	2,940 metres	2,940 metres
Duration of impacts	Temporary	Permanent
Scale of development	Low	Low
Reversibility of change	Irreversible	Irreversible
Magnitude of change	Small	Small

Table 11.12b Significance Threshold during Construction

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate - Significant impact	
	Small	Slight impact	Slight - Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

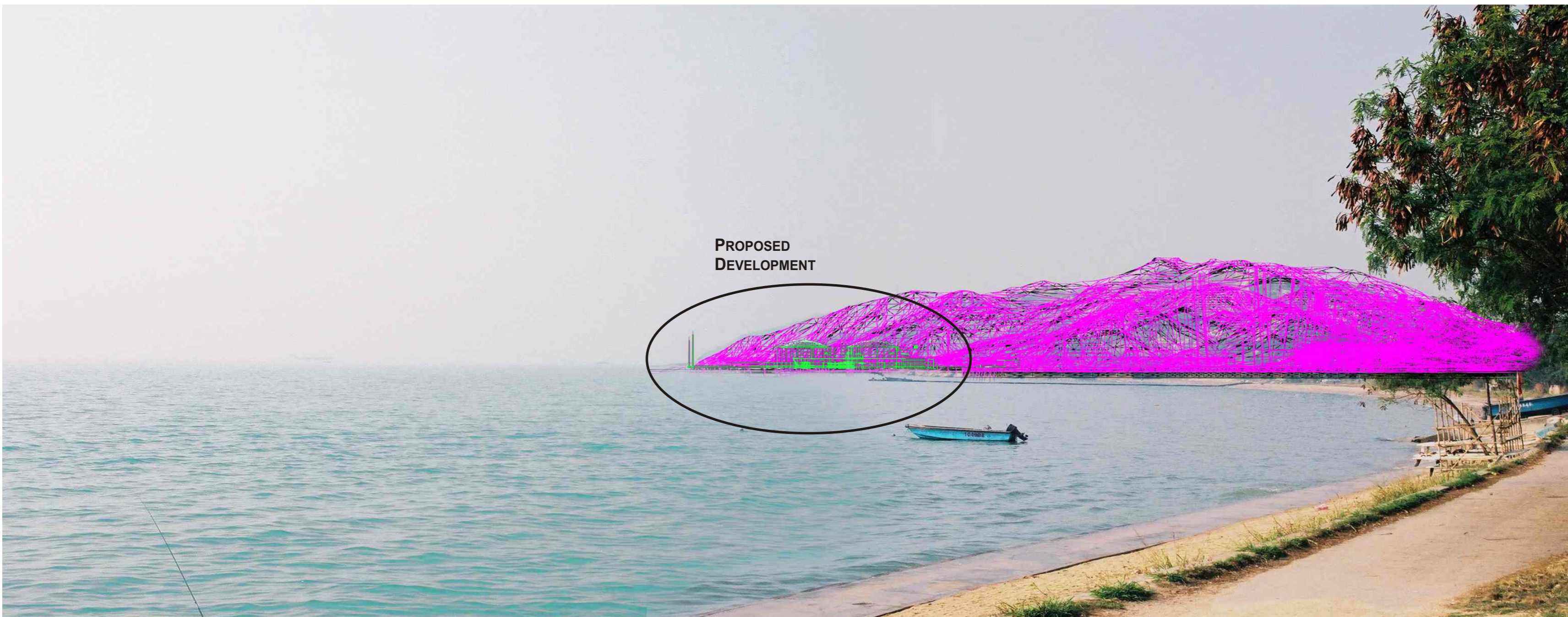
Table 11.12c Significance Threshold during Operation

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate - Significant impact	
	Small	Slight impact	Slight - Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

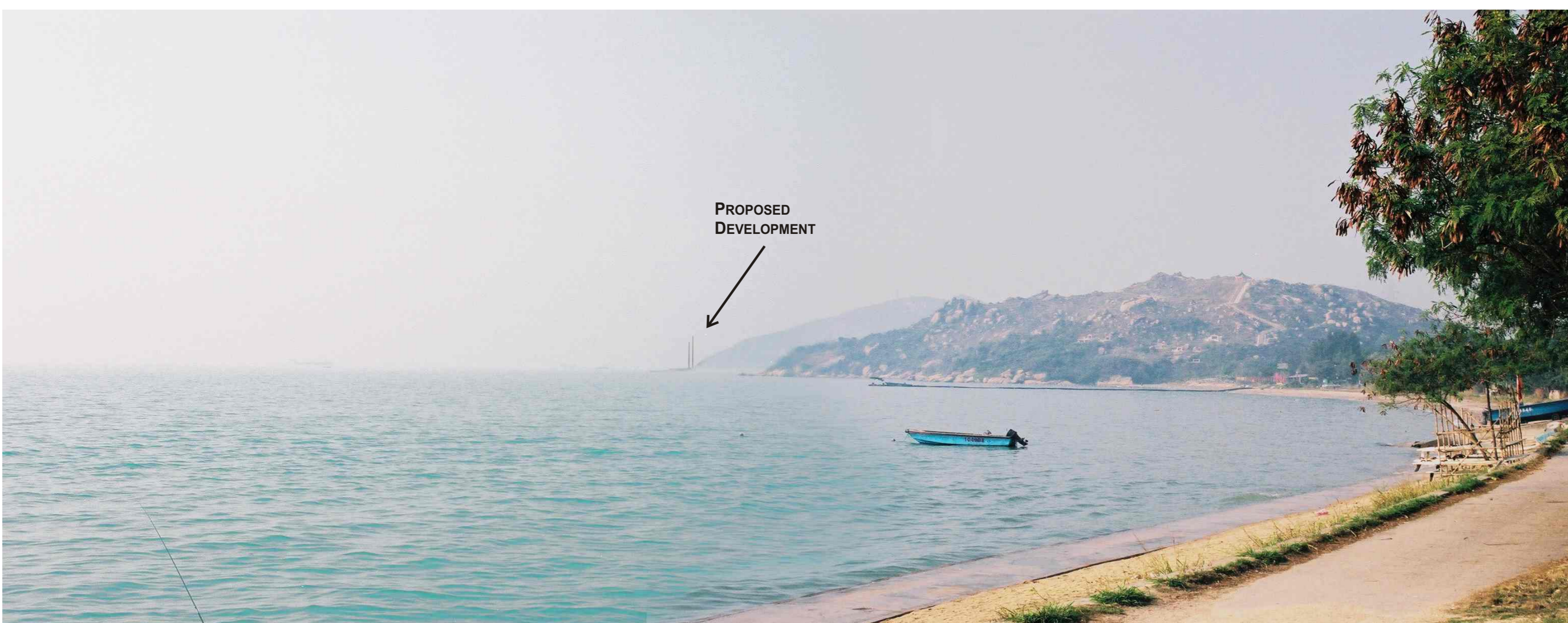
Given the long distance from this viewpoint and the high availability of other views, the visual impact is *Slight-Moderate*.



**EXISTING CONDITION LOOKING NORTH EAST TOWARDS THE DEVELOPMENT FROM LUNG TSAI BEACH.**



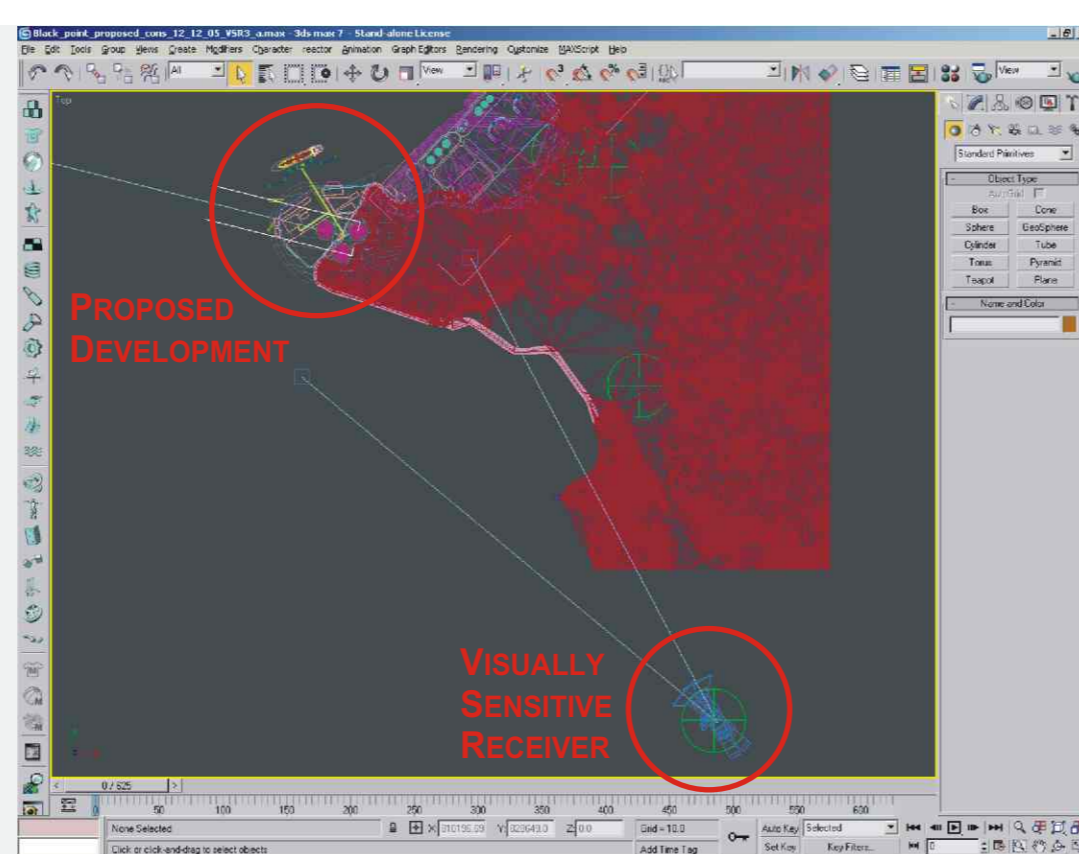
**WIREFRAME VIEW OF THE PROPOSED DEVELOPMENT AND THE DIGITAL TERRAIN MODEL COMPOSITED ONTO THE PHOTOGRAPHS.**



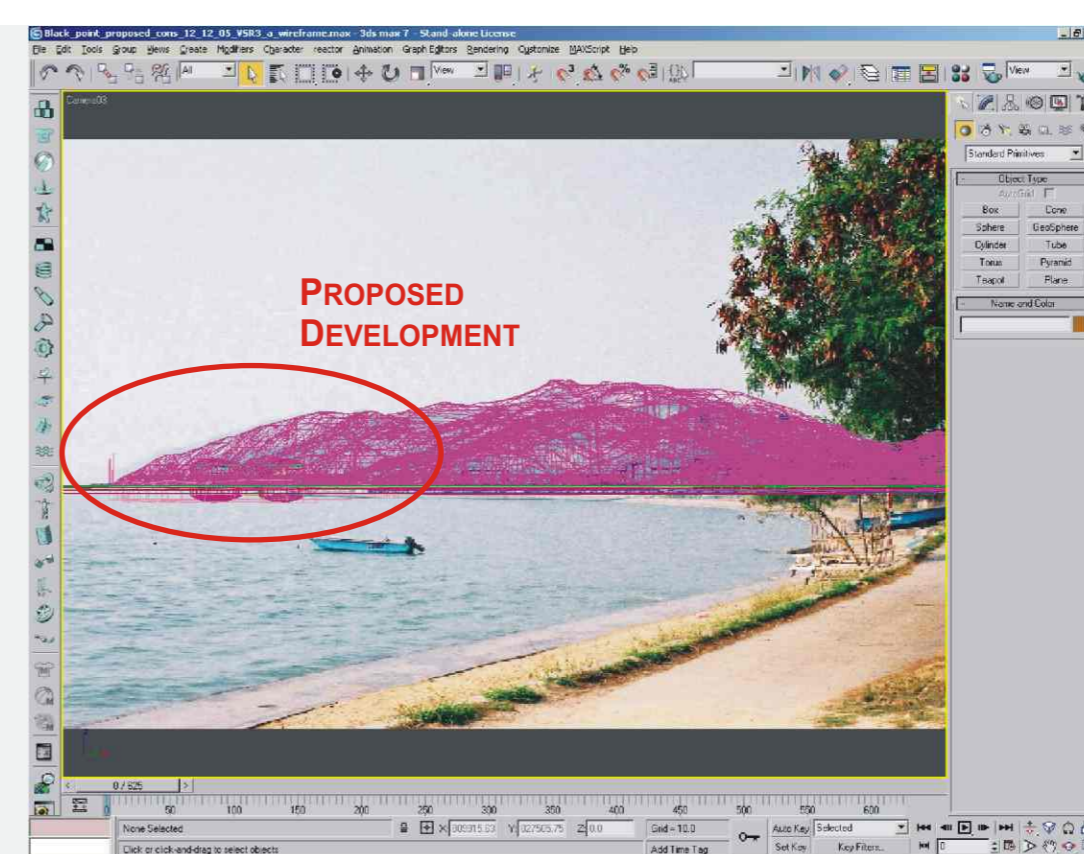
**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITHOUT MITIGATION MEASURES**



**MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.**



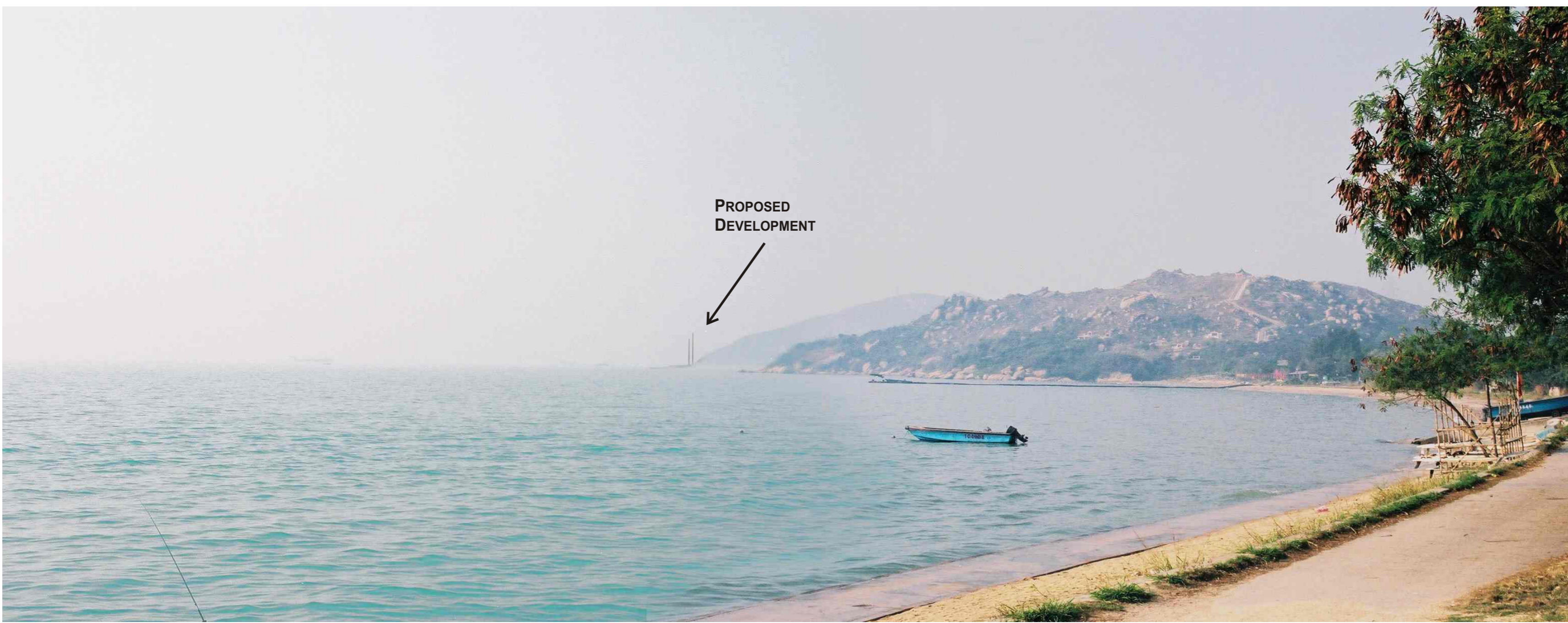
**PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.**



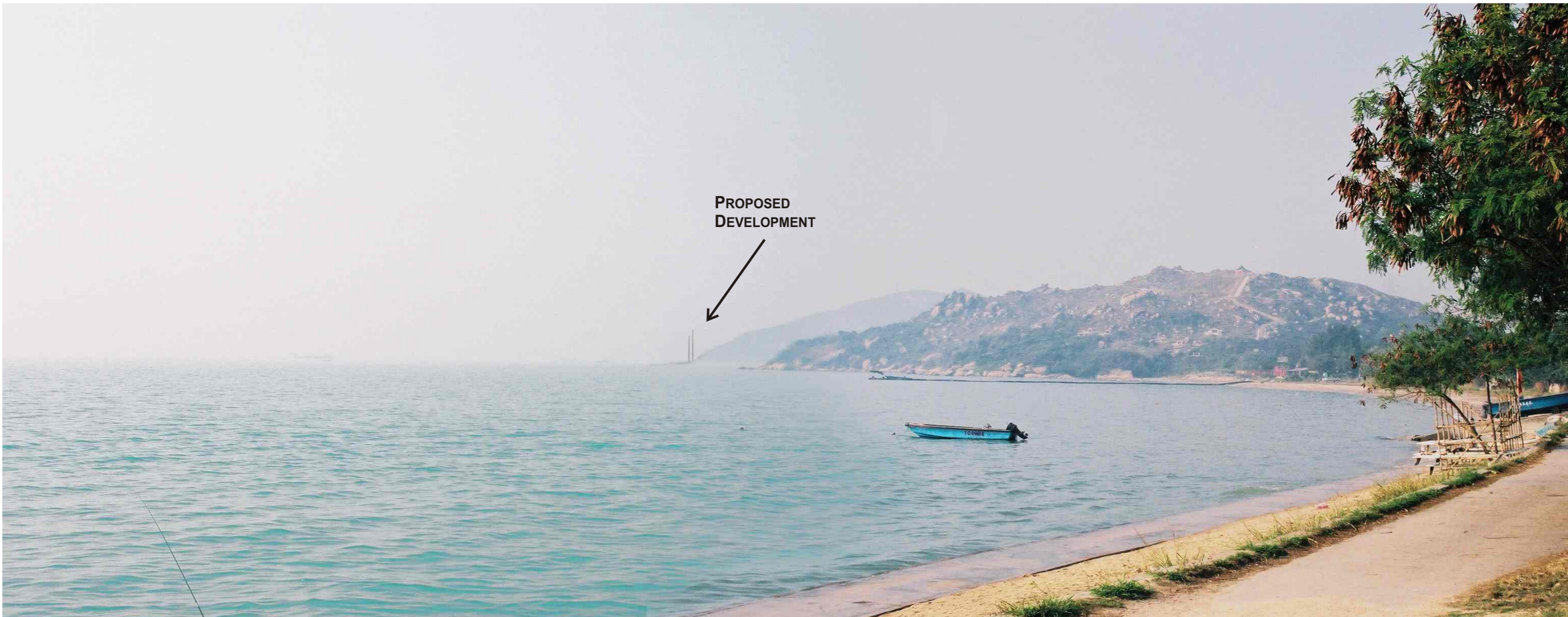
**VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.**

**FIGURE 11.24  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 1**

**VISUALLY SENSITIVE RECEIVER 1  
VIEW FROM LUNG TSAI BEACH**  
GPS: EASTING: 809918.51  
NORTHING: 827444.27  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 2,941M



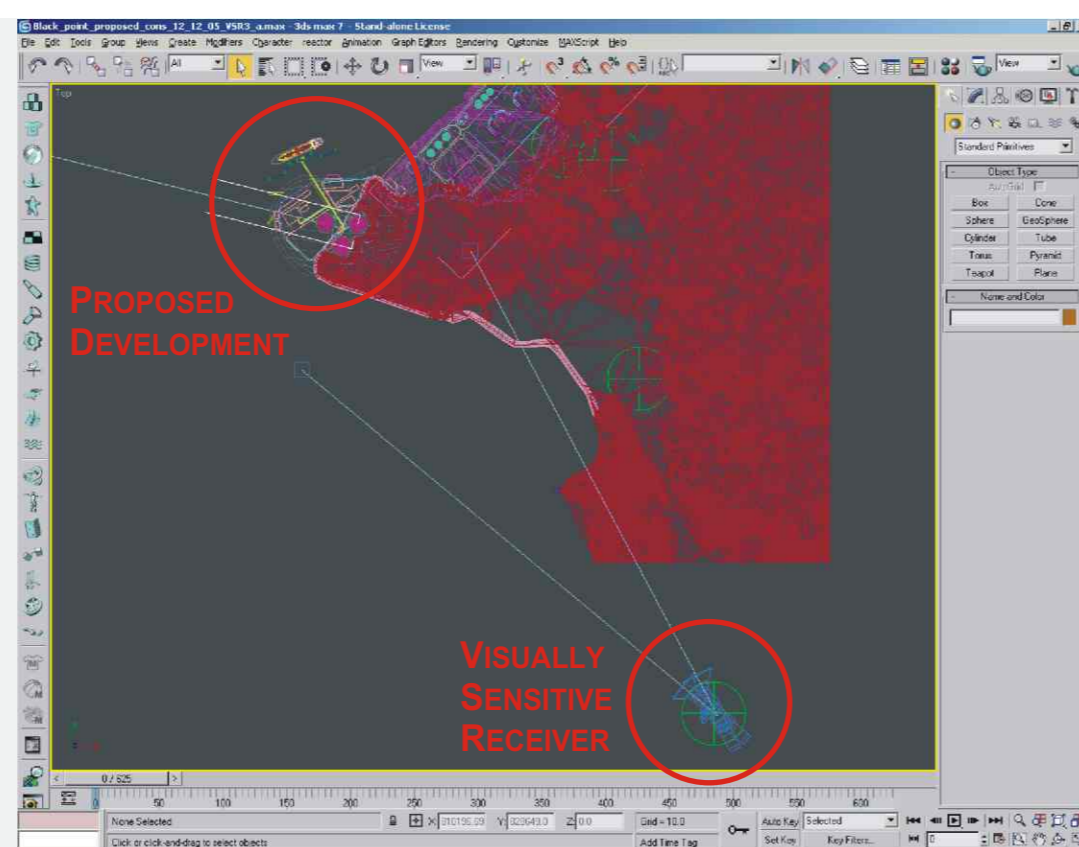
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITH MITIGATION MEASURES



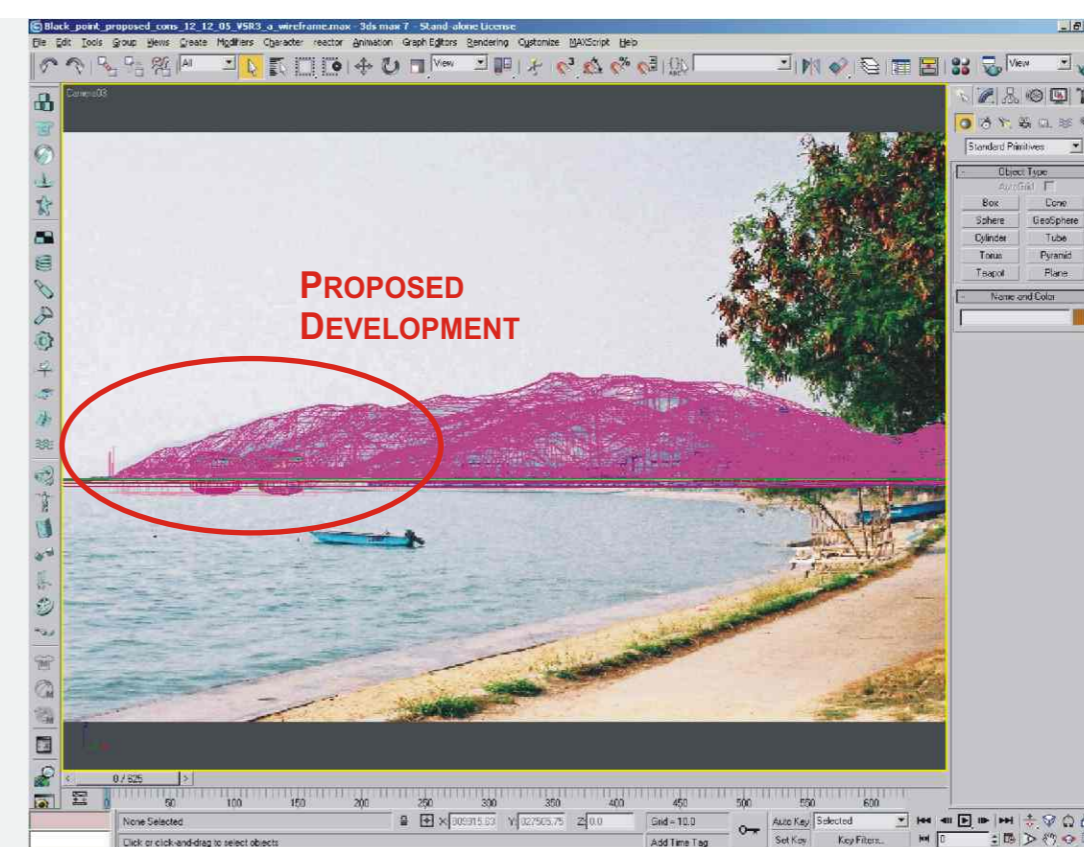
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT YEAR 10 WITH MITIGATION MEASURES



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

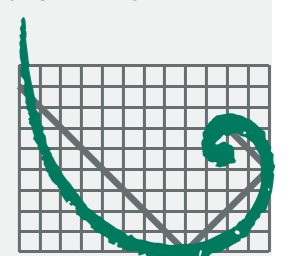
**FIGURE 11.24A  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 1**

**VISUALLY SENSITIVE RECEIVER 1  
VIEW FROM LUNG TSAI BEACH**  
GPS: EASTING:  
NORTHING:  
GRID DATUM:  
DISTANCE FROM DEVELOPMENT:

809918.51  
827444.27  
HK 1980  
2,941M

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### 11.17.2 VSR2 – View from Ferry Lane

This viewpoint is taken from the ferry lane edge closest to the terminal. This viewpoint is 2010 metres to the north west of the site and is an example as a view from the ocean.

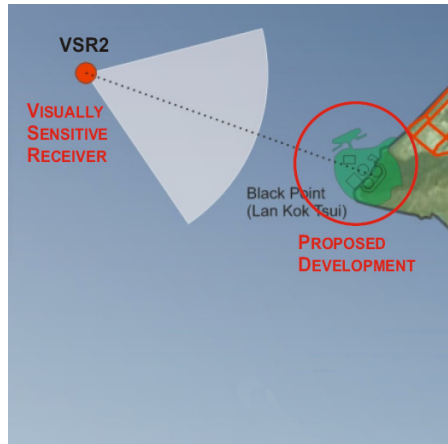


Figure 11.25 VSR2 Ferry Lane

Photomontage 2 on the following page shows that the LNG terminal will be visible, however due to the changing seascape and the presence of similar existing nearby facilities, its visibility will be reduced.

Table 11.13 Sensitivity / Quality of VSR

Value and quality of view	High
Visitor numbers	Medium
Availability and amenity of alternative views	Medium
Duration and frequency of views to facility	Short and variable
Degree of visibility	High
Sensitivity/Quality of VSR	Medium

Table 11.13a Magnitude of Change

	Construction	Operation
Compatibility with surrounding landscape	Low	Low
Potential blockage of view	Medium	Medium
Distance to Terminal	2,010 metres	2,010 metres
Duration of impacts	Temporary	Permanent
Scale of development	Medium	Medium
Reversibility of change	Irreversible	Irreversible
Magnitude of change	Intermediate	Intermediate

Table 11.13b Significance Threshold during Construction

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

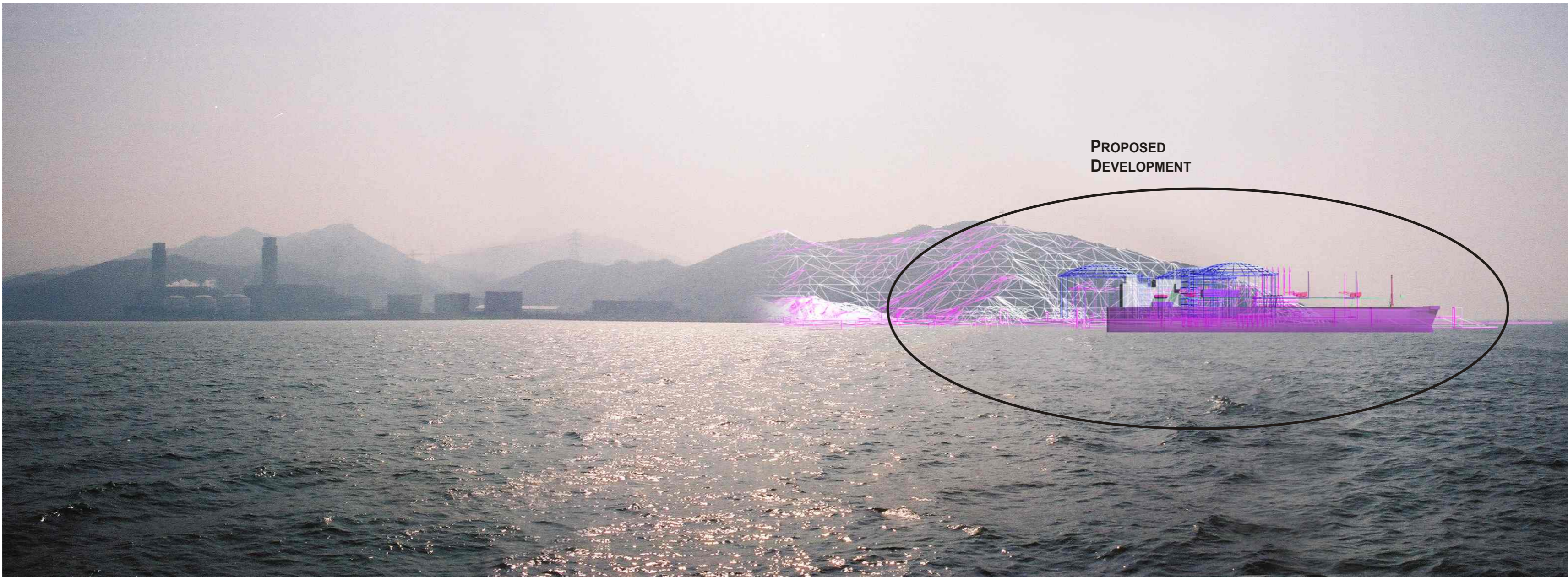
Table 11.13c Significance Threshold during Operation

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

There will be a *Moderate* impact from users of the ferries.



**EXISTING CONDITION LOOKING SOUTH EAST TOWARDS THE DEVELOPMENT FROM BLACK POINT FERRY LANE.**

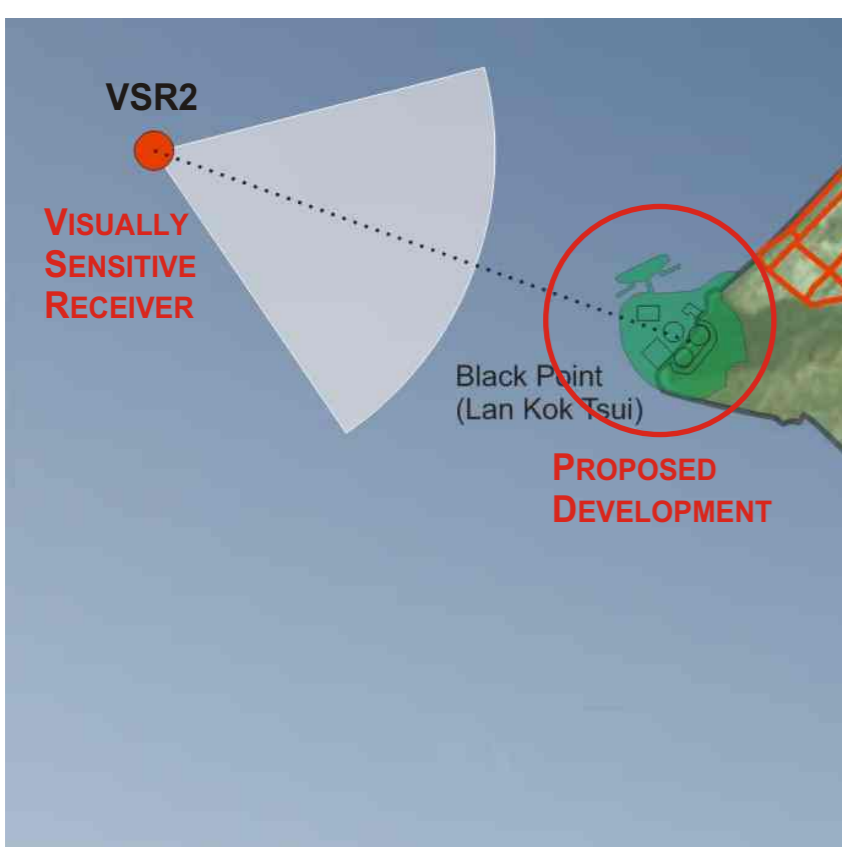


**WIREFRAME VIEW OF THE PROPOSED DEVELOPMENT AND THE DIGITAL TERRAIN MODEL COMPOSITED ONTO THE PHOTOGRAPHS.**

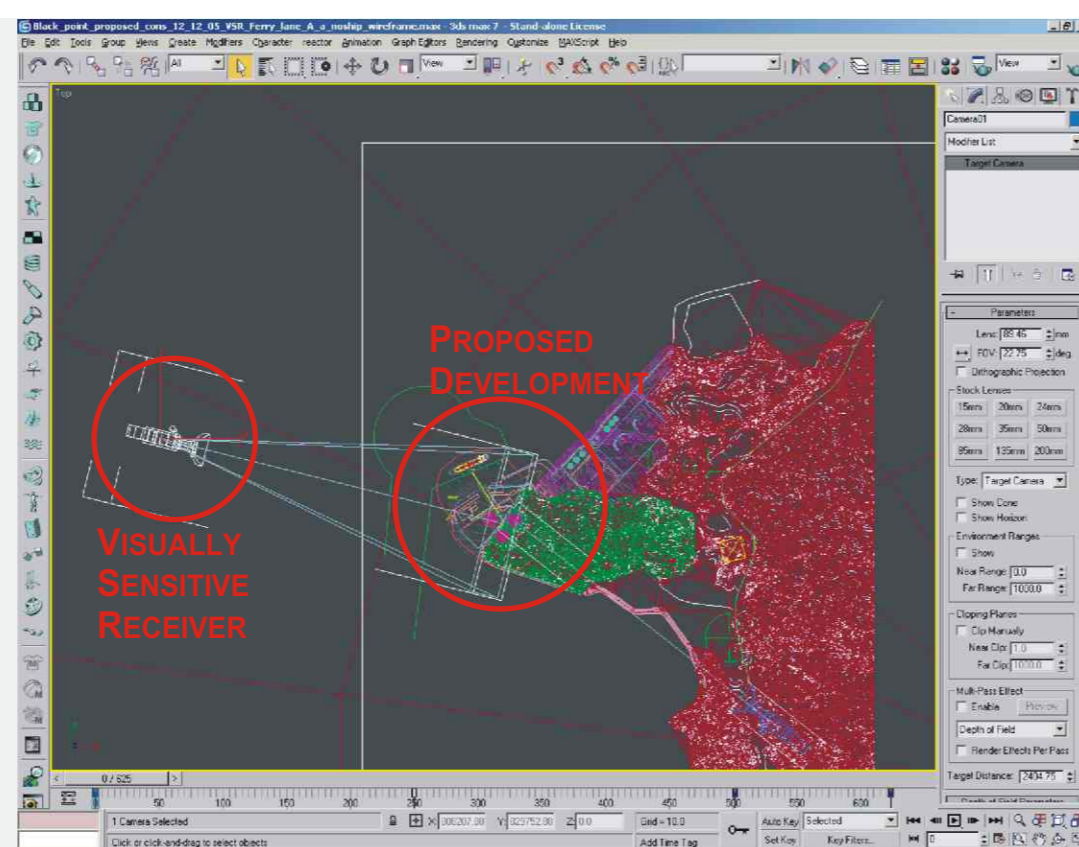


**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT.**

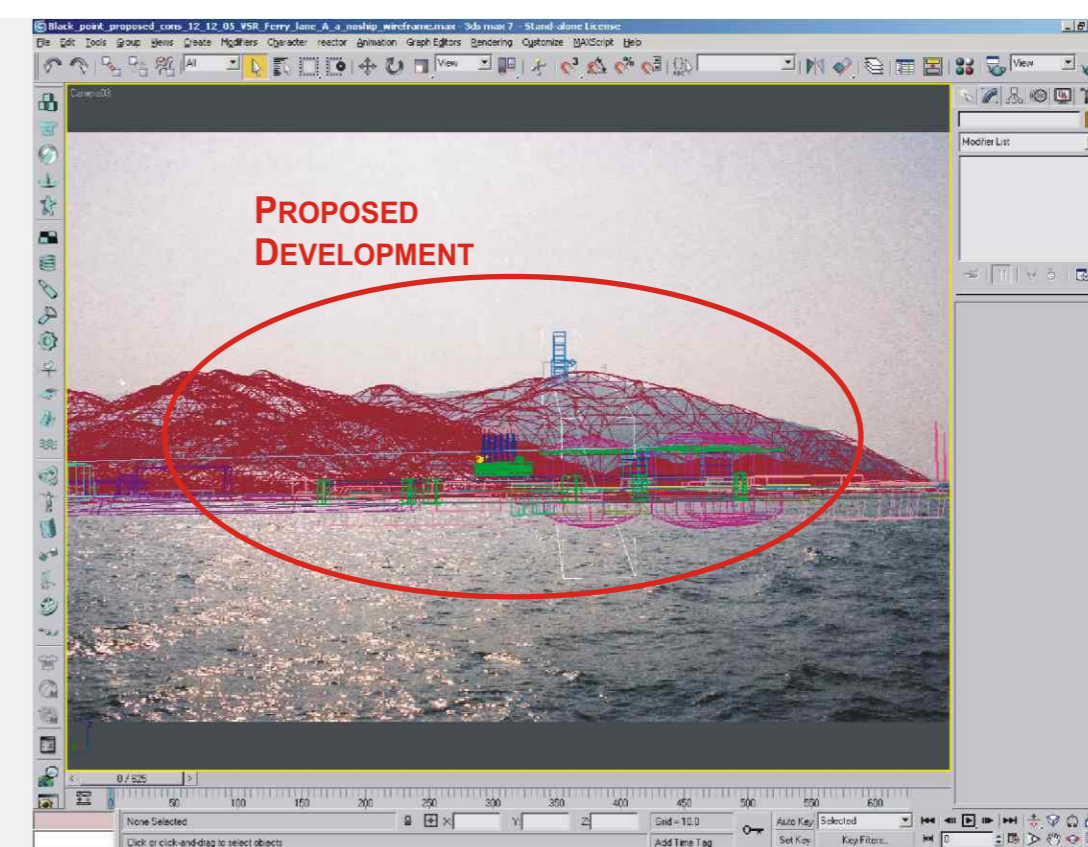
(CARRIER REMOVED TO SHOW DETAIL)



**MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.**



**PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.**



**VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.**

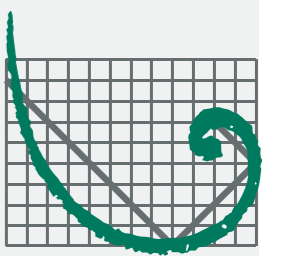
**FIGURE 11.26  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 2**

**VISUALLY SENSITIVE RECEIVER 2  
VIEW FROM BLACK POINT FERRY LANE**  
GPS: EASTING: 805819.75  
NORTHING: 830431.06  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 2,009M

**LNG TERMINAL BLACK POINT LVIA**

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**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITH MITIGATION MEASURES**

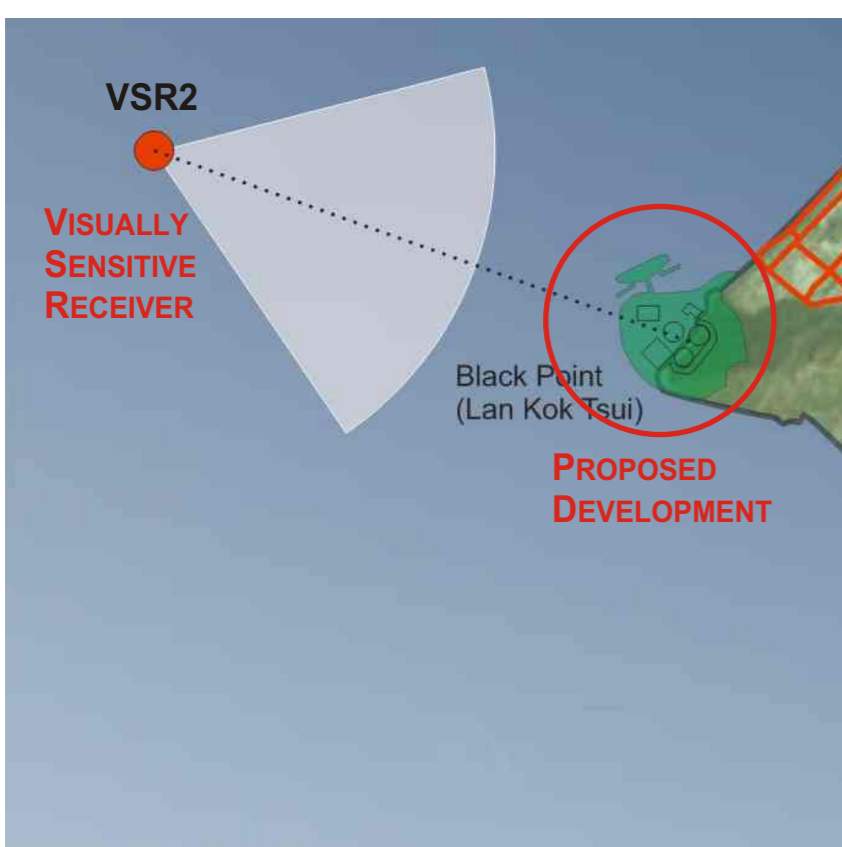
(CARRIER REMOVED TO SHOW DETAIL)



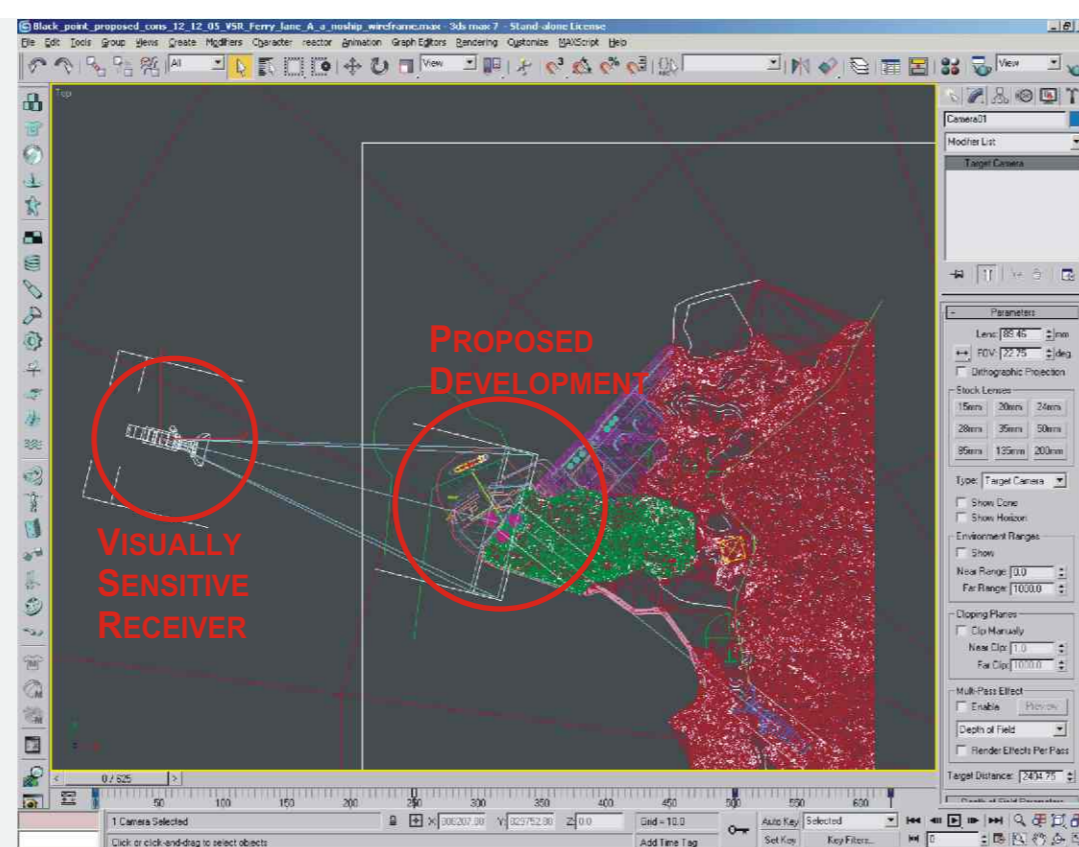
**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT YEAR 10 WITH MITIGATION MEASURES**

(CARRIER REMOVED TO SHOW DETAIL)

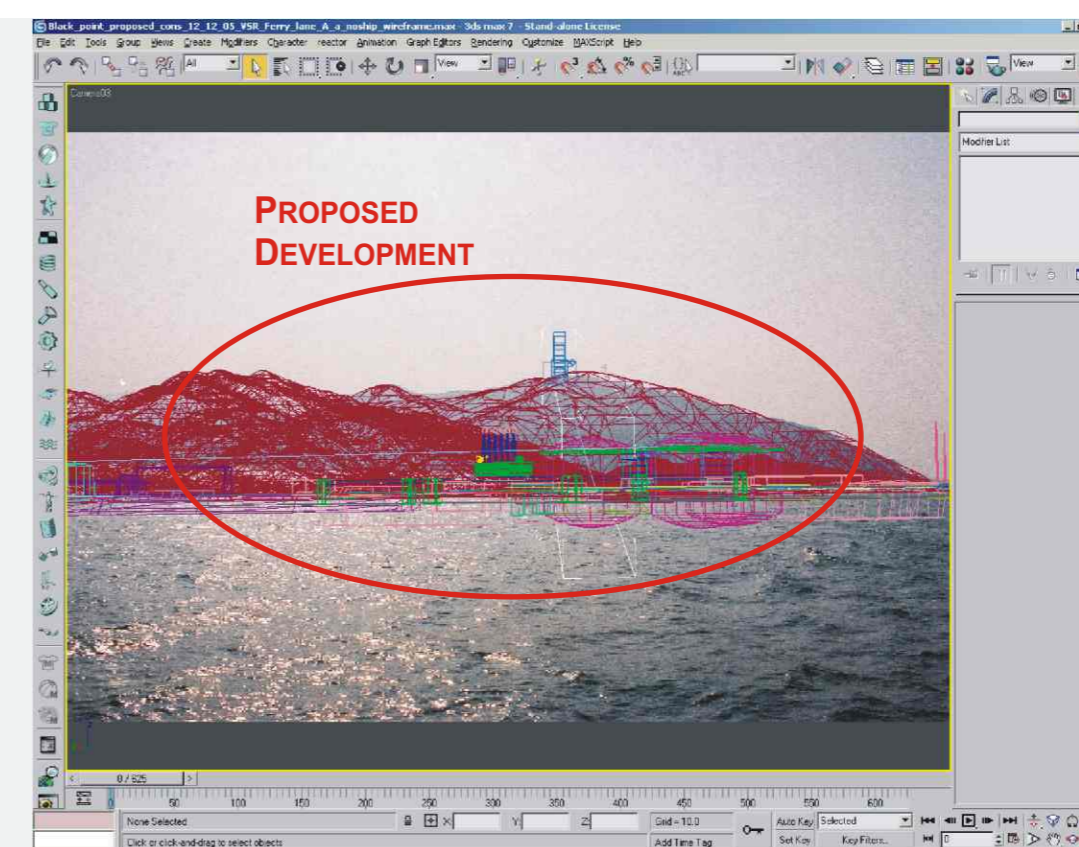
LNG TERMINAL BLACK POINT L VIA



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



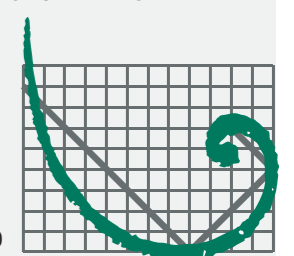
VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

**FIGURE 11.26A  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 2**

VISUALLY SENSITIVE RECEIVER 2  
VIEW FROM BLACK POINT FERRY LANE  
GPS: EASTING: 805819.75  
NORTHING: 830431.06  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 2,009M

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### 11.17.3 VSR3 – View from Above Black Point

This viewpoint is from the end of the restricted access road above the existing Black Point Powers Station. This viewpoint is approximately 1,035m from the terminal.

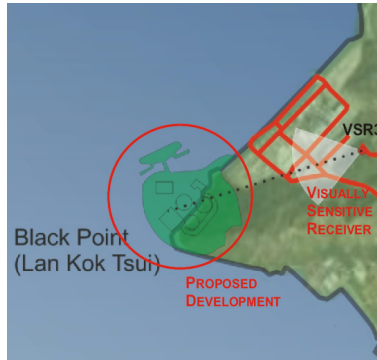


Figure 11.27 VSR3 Above Black Point

Photomontage 3 on the following page shows that the view is dominated by the existing Power Station facilities rather than the proposed terminal. This VSR is a view from the Road Network. There are also very low visitor numbers to this location.

Table 11.14 Sensitivity / Quality of VSR

Value and quality of view	Low
Visitor numbers	Low
Availability and amenity of alternative views	High
Duration and frequency of views to facility	Short
Degree of visibility	Medium
Sensitivity/Quality of VSR	Low

Table 11.14a Magnitude of Change

	Construction	Operation
Compatibility with surrounding landscape	Medium	Medium
Potential blockage of view	Low	Low
Distance to Terminal	1,035 metres	1,035 metres
Duration of impacts	Temporary	Permanent
Scale of development	Medium	Medium
Reversibility of change	Irreversible	Irreversible
Magnitude of change	Small	Small

Table 11.14b Significance Threshold during Construction

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

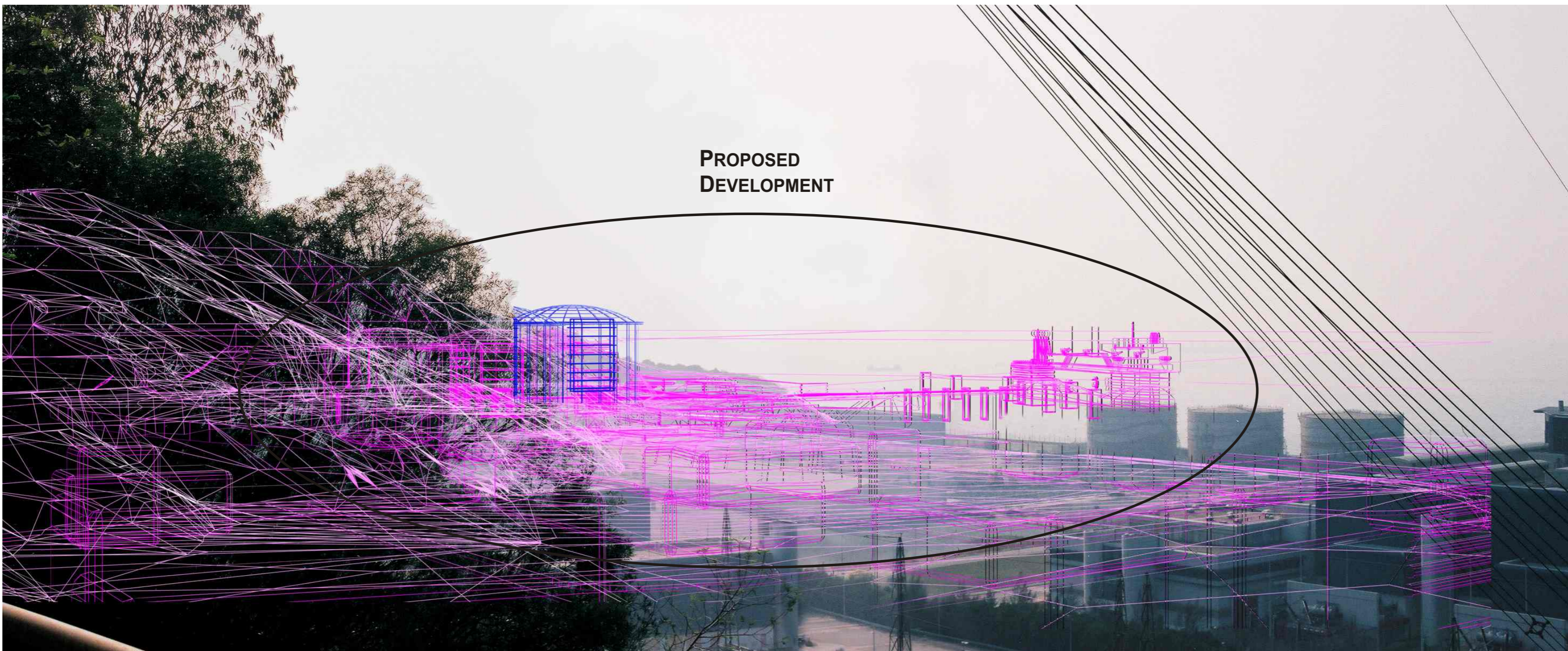
Table 11.14c Significance Threshold during Operation

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

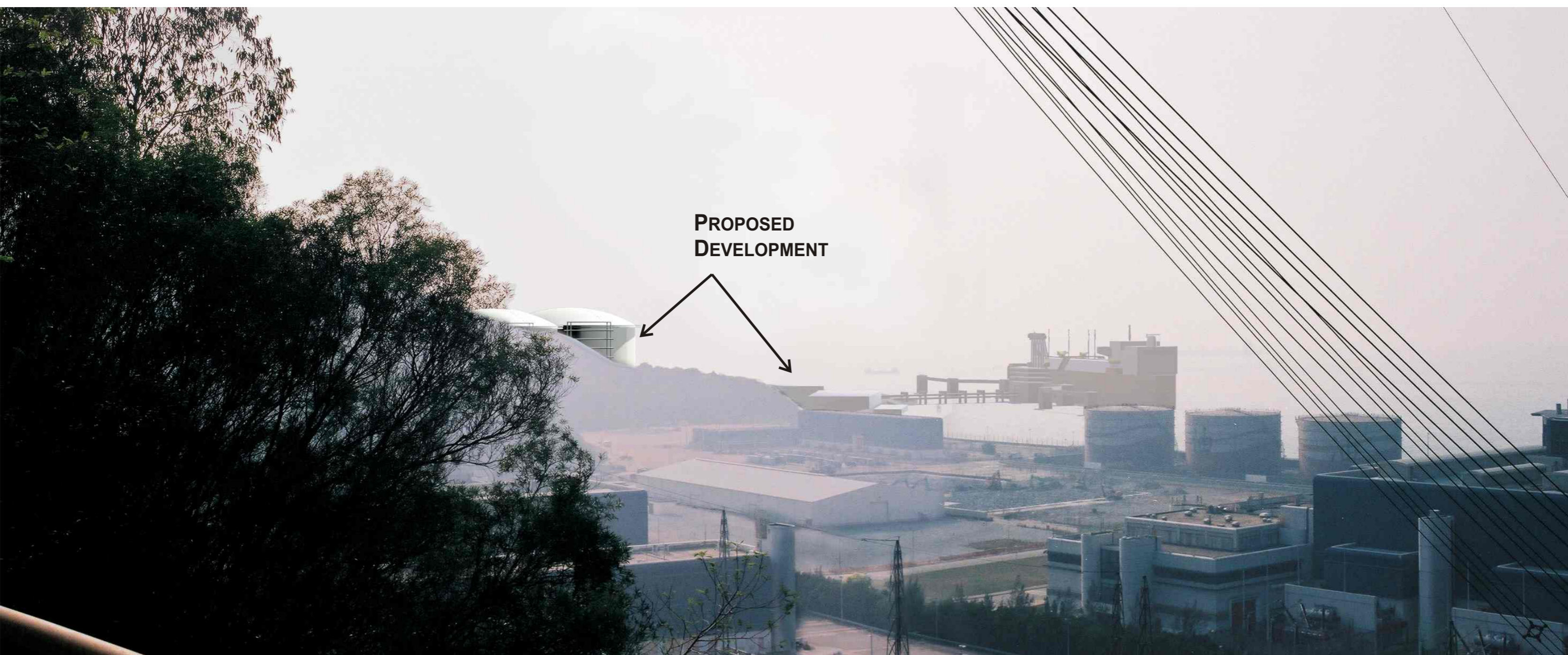
The proposed Terminal is sited within the view of the existing Black Point Power Plant Facility, therefore there will be a *Slight* visual impact.



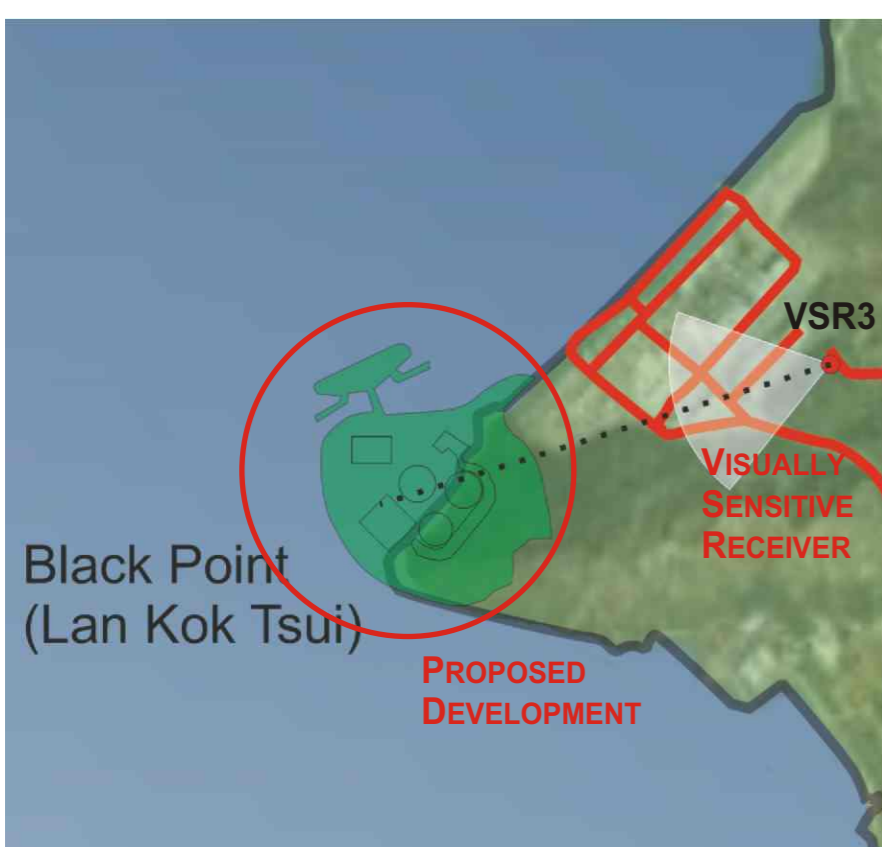
**EXISTING CONDITION LOOKING SOUTH WEST TOWARDS THE DEVELOPMENT FROM ABOVE BLACK POINT.**



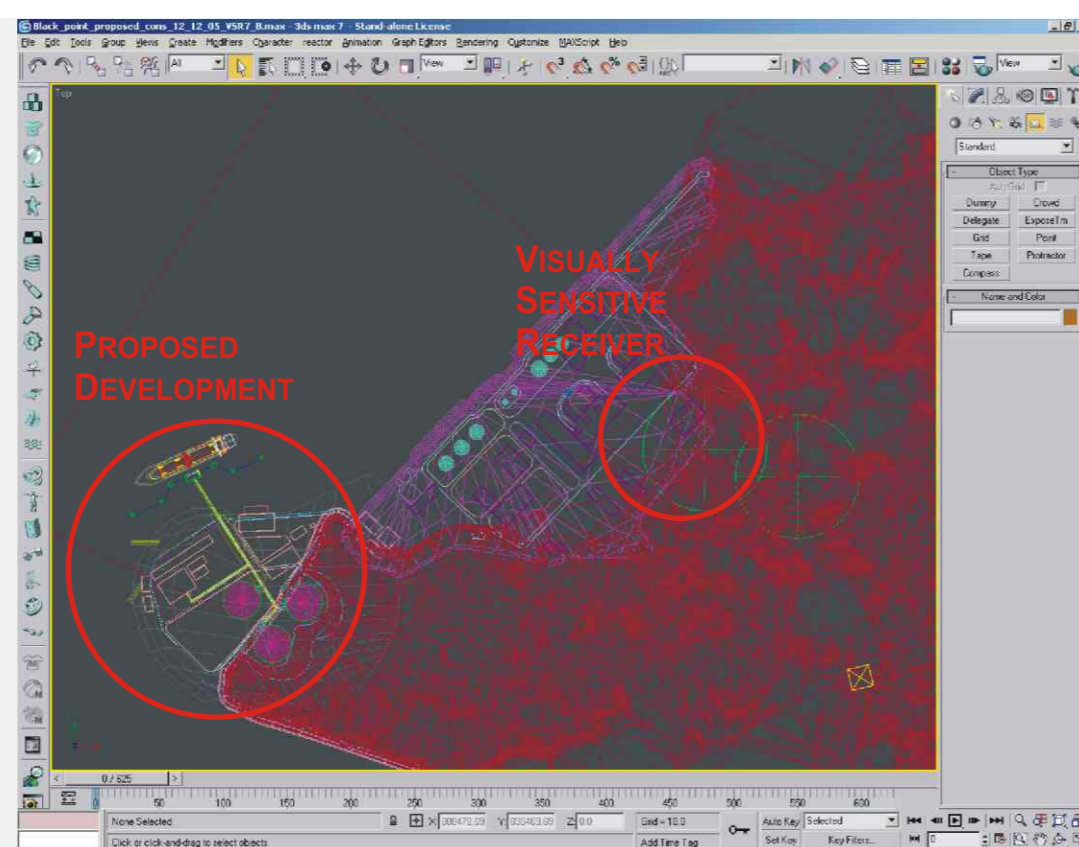
**WIREFRAME VIEW OF THE PROPOSED DEVELOPMENT AND THE DIGITAL TERRAIN MODEL COMPOSITED ONTO THE PHOTOGRAPHS.**



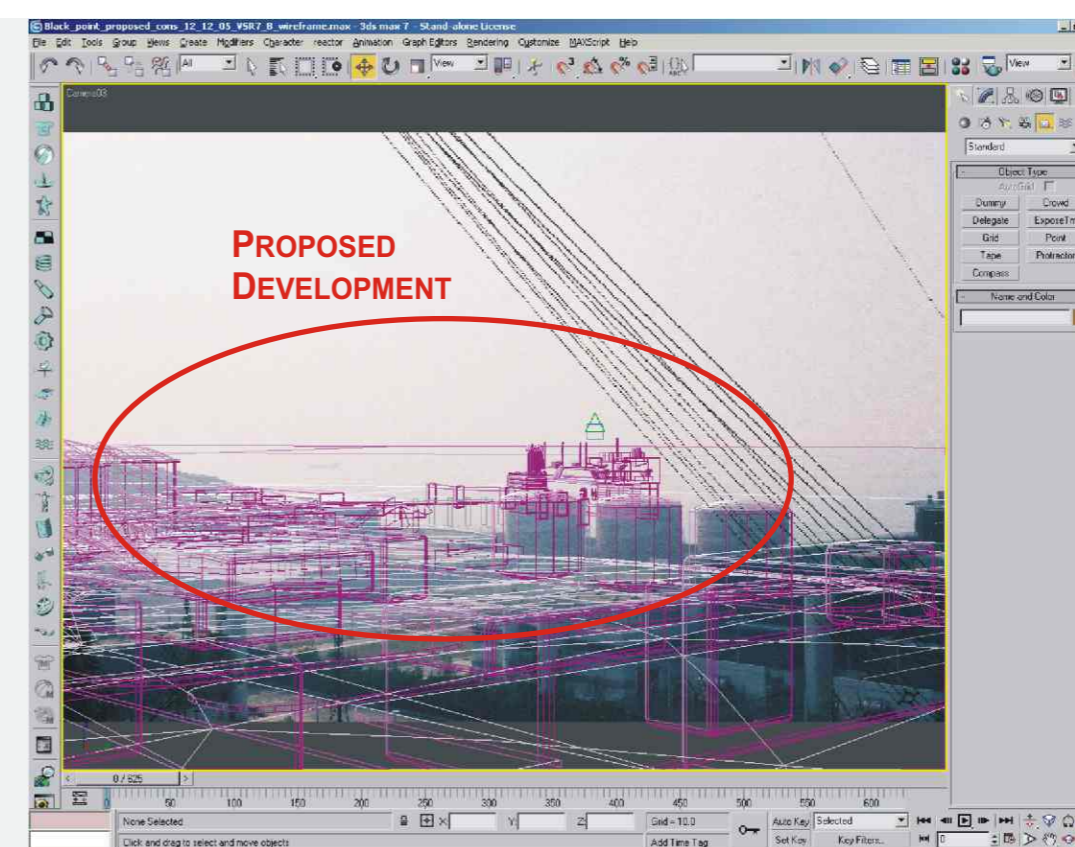
**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITHOUT MITIGATION MEASURES**



**MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.**



**PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.**



**VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.**

**FIGURE 11.28  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 3**

**VISUALLY SENSITIVE RECEIVER 3  
VIEW FROM ABOVE BLACK POINT  
GPS: EASTING:  
NORTHING:  
GRID DATUM:  
DISTANCE FROM DEVELOPMENT:**

**809169.11  
830287.49  
HK 1980  
1,035M**

ENVIRONMENTAL RESOURCES MANAGEMENT LTD

Landscape Architecture  
& Urban Design  
21 / F Lincoln House  
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Phone (852) 2271 3000  
Fax (852) 2723 5660

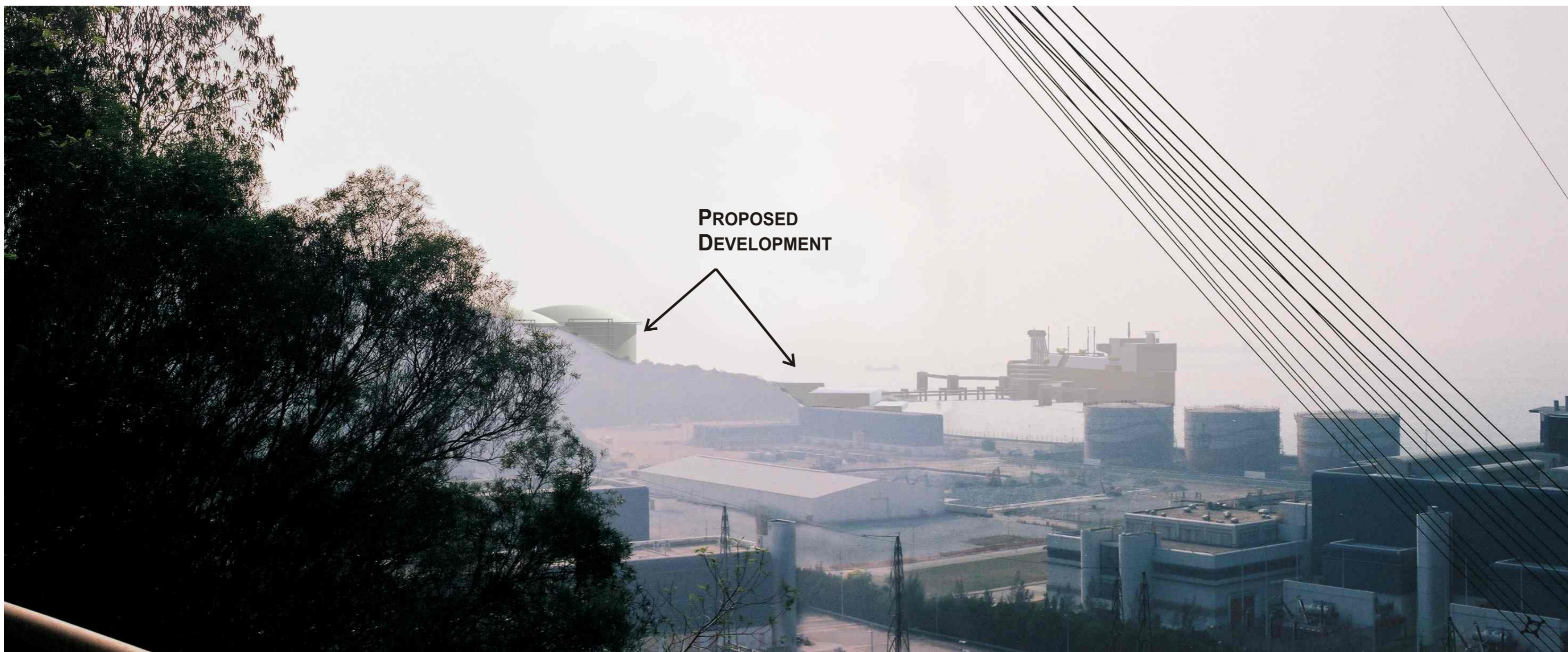
Project No. 0018180  
February 2006



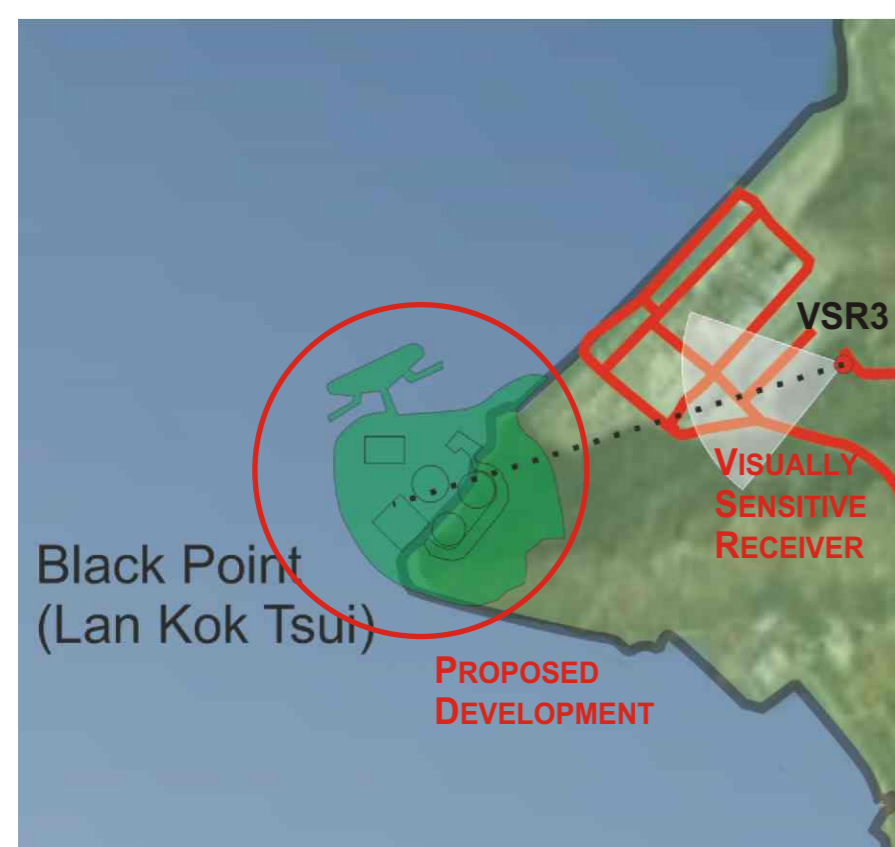
**LNG TERMINAL BLACK POINT LVIA**



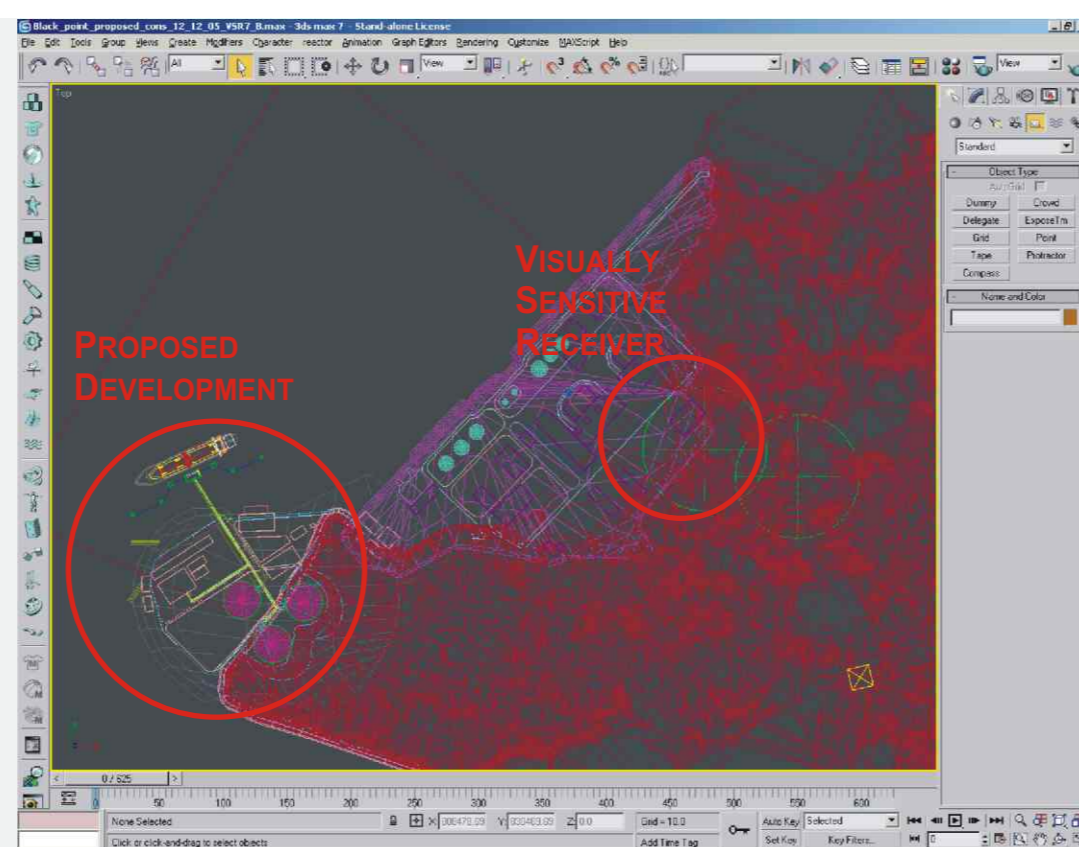
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITH MITIGATION MEASURES



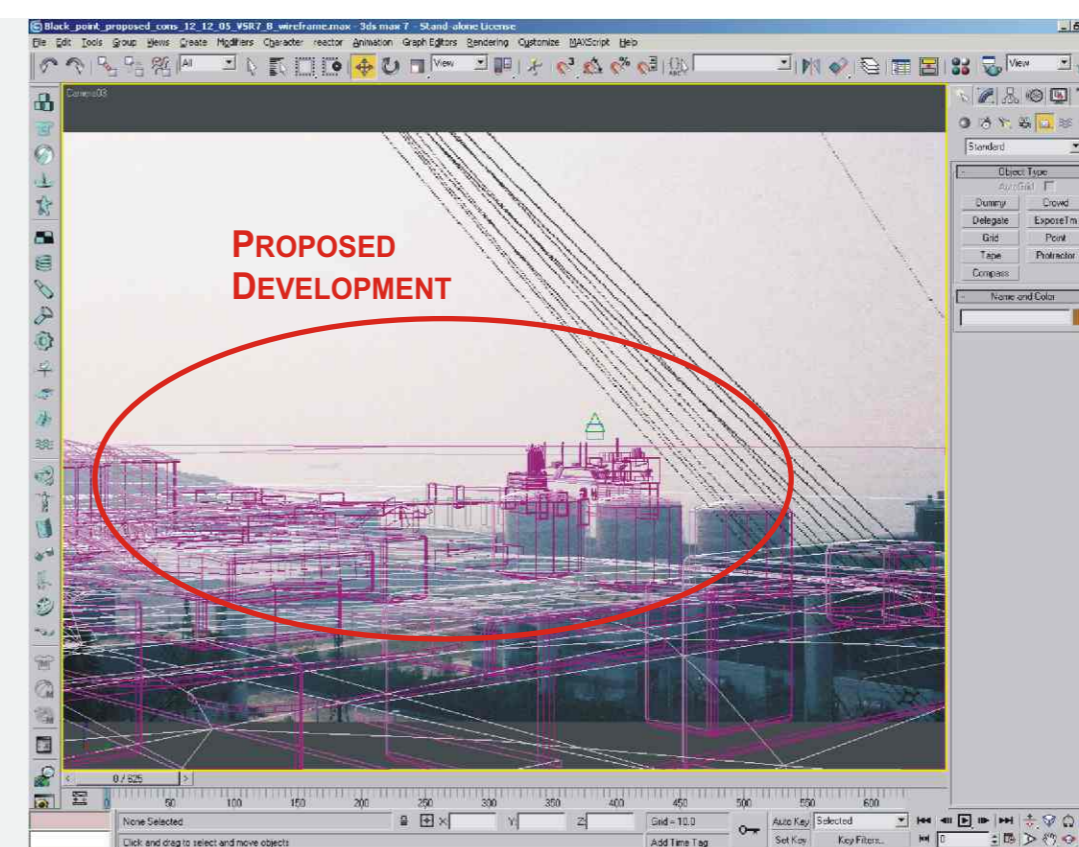
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT YEAR 10 WITH MITIGATION MEASURES



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

**FIGURE 11.28A  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 3**

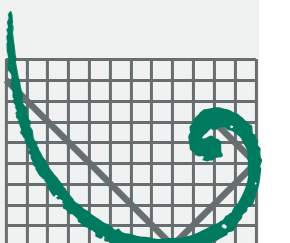
**VISUALLY SENSITIVE RECEIVER 3  
VIEW FROM ABOVE BLACK POINT**  
GPS: EASTING:  
NORTHING:  
GRID DATUM:  
DISTANCE FROM DEVELOPMENT:

809169.11  
830287.49  
HK 1980  
1,035M

**LNG TERMINAL BLACK POINT LVIA**

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Fax (852) 2723 5660



Project No. 0018180  
February 2006

**ERM**

11.17.4 VSR4– Elevated View from Public Road (Lung Mun Road)

This VSR is from the Road Network. The viewpoint was selected as it is the closest view from the Lung Mun Road and it is approximately 1230 metres from the terminal.

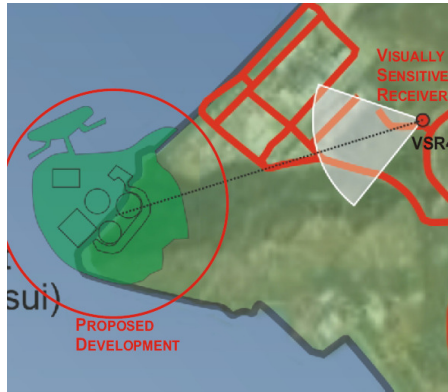


Figure 11.29 VSR4 Elevated View from Lung Mun Road

Whilst a GIS analysis showed that the terminal would be visible from here, photomontage 4 on the following page shows that the surrounding vegetation screens the site so that only a small portion of the terminal is visible from this viewpoint.

Table 11.15 Sensitivity / Quality of VSR

Value and quality of view	Medium
Visitor numbers	Medium
Availability and amenity of alternative views	Medium
Duration and frequency of views to facility	Short and variable
Degree of visibility	Low
Sensitivity/Quality of VSR	Low

Table 11.15a Magnitude of Change

	Construction	Operation
Compatibility with surrounding landscape	Low	Low
Potential blockage of view	Low	Low
Distance to Terminal	1,225 metres	1,225 metres
Duration of impacts	Temporary	Permanent
Scale of development	Medium	Medium
Reversibility of change	Irreversible	Irreversible
Magnitude of change	Small	Small

Table 11.15b Significance Threshold during Construction

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

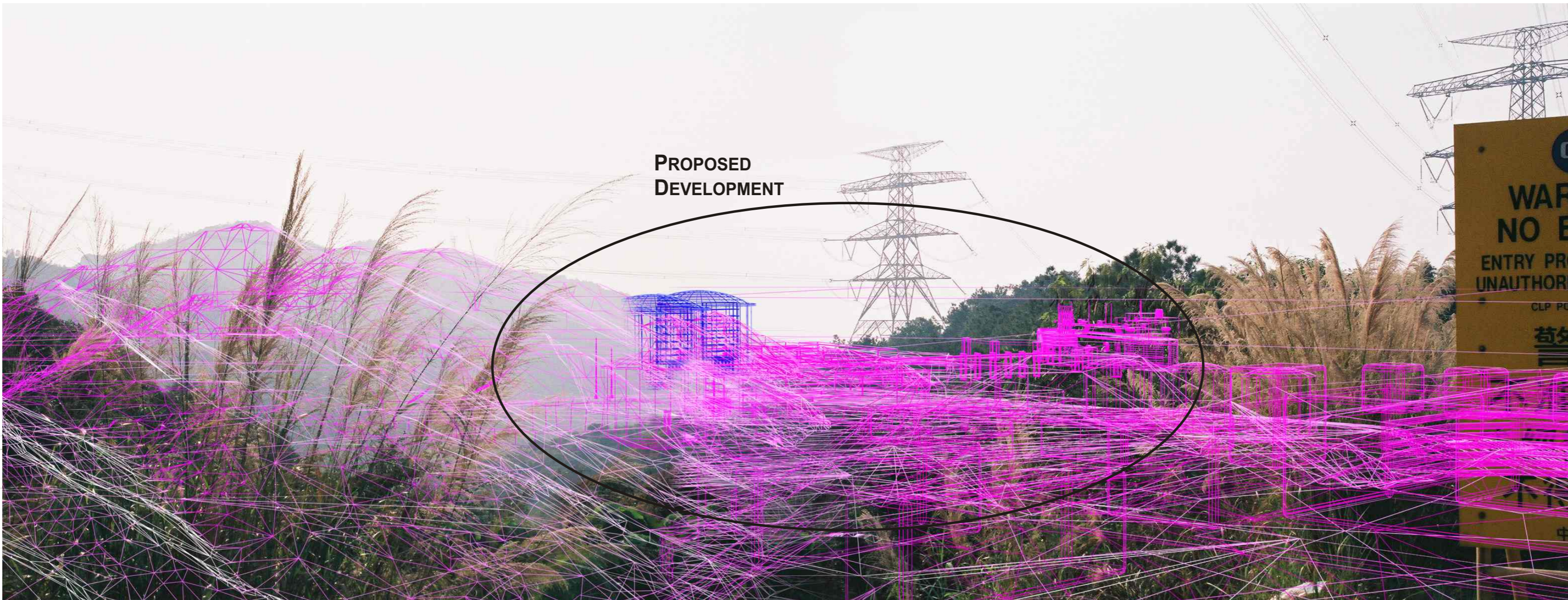
Table 11.15b Significance Threshold during Operation

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

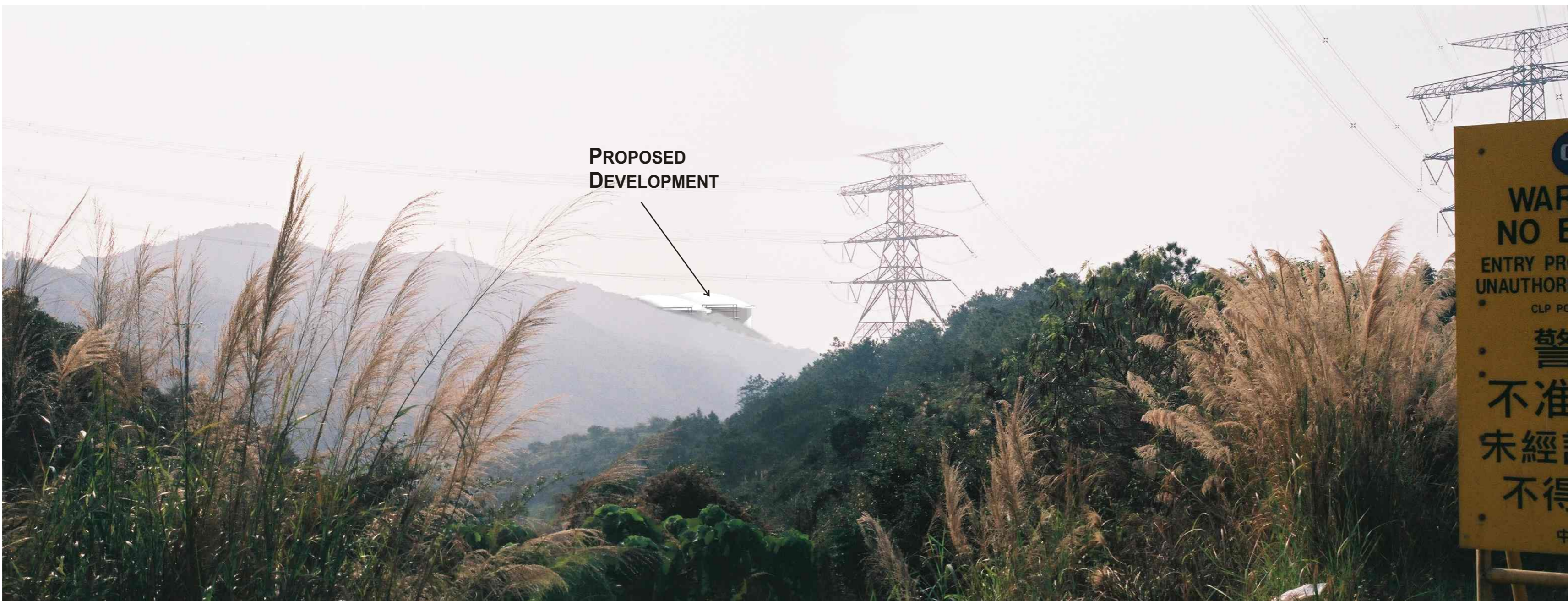
Only a small portion of the Terminal will be visible from this viewpoint due to existing vegetation and therefore the visual impacts will be *Slight*.



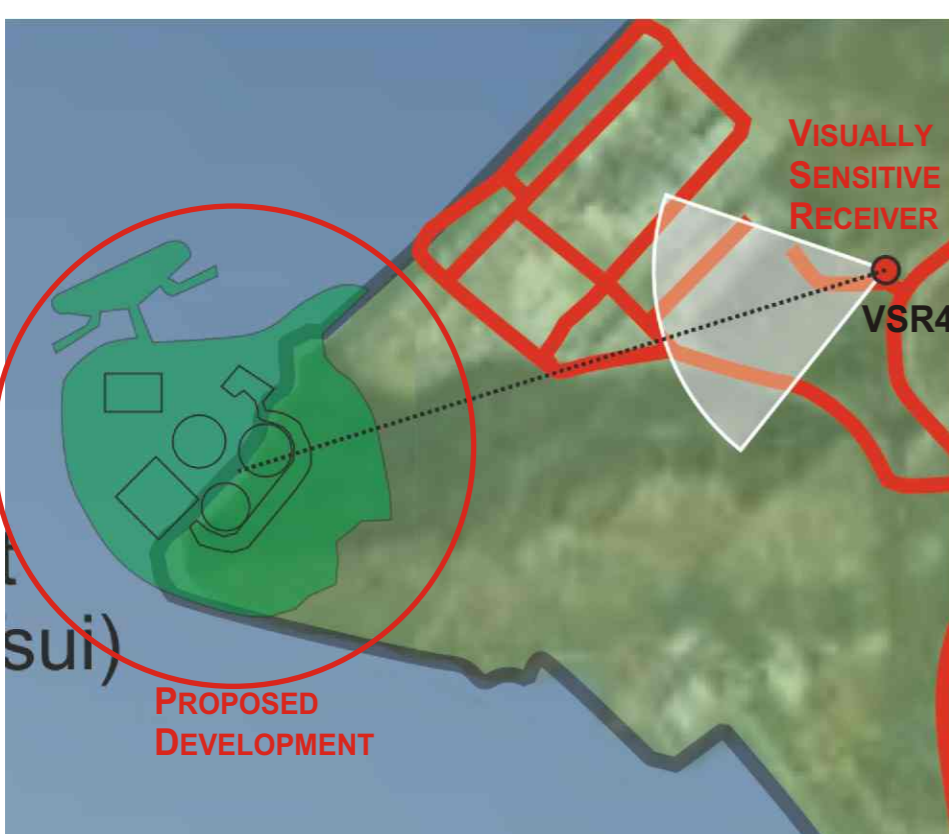
EXISTING CONDITION LOOKING SOUTH WEST TOWARDS THE DEVELOPMENT FROM LUNG MUN ROAD.



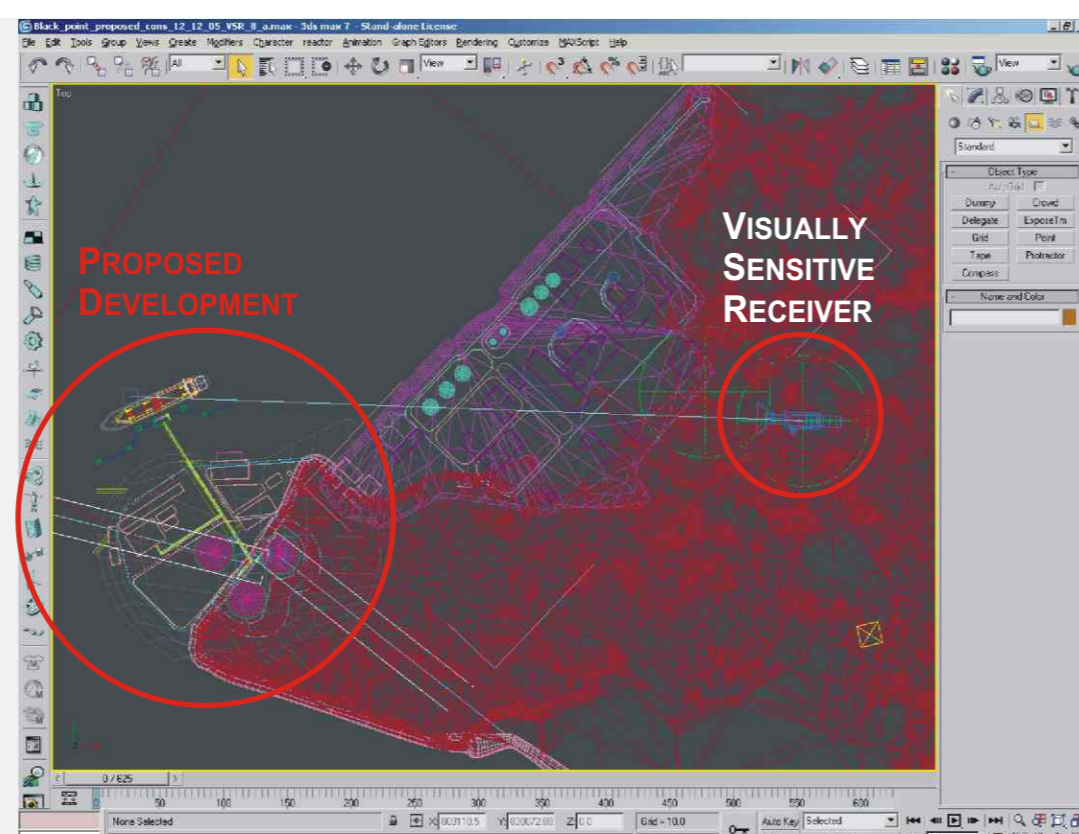
WIREFRAME VIEW OF THE PROPOSED DEVELOPMENT AND THE DIGITAL TERRAIN MODEL COMPOSITED ONTO THE PHOTOGRAPHS.



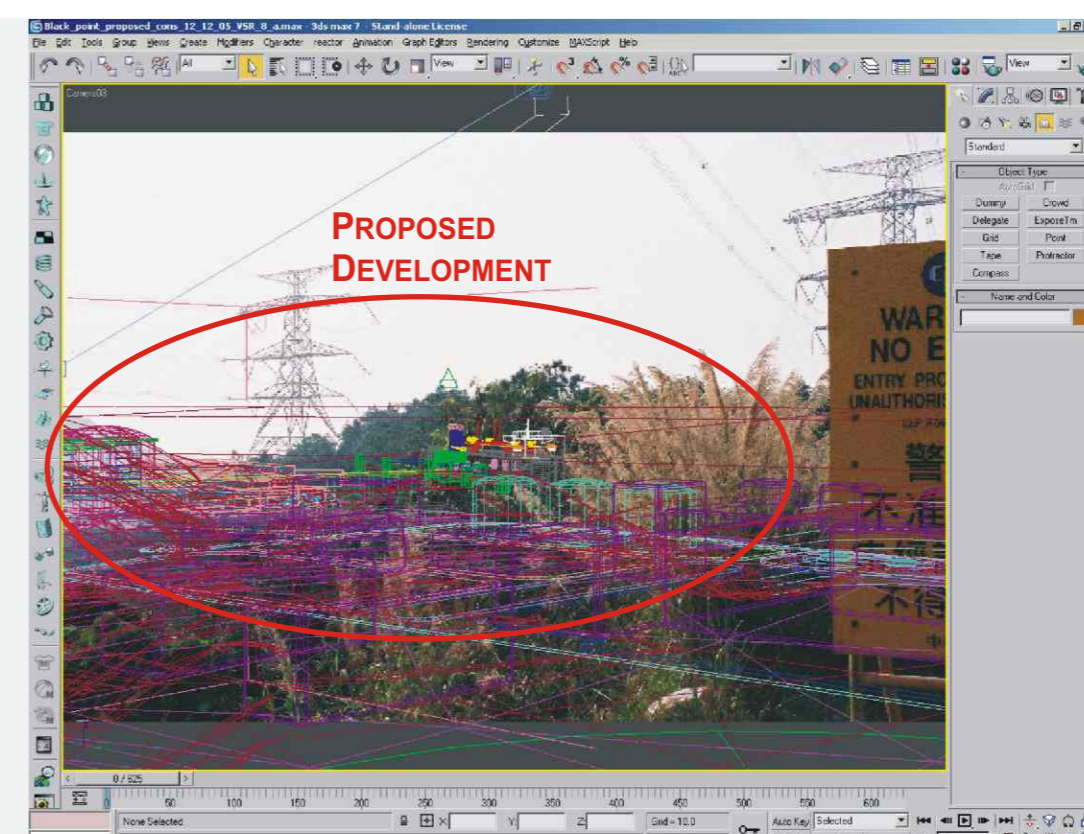
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITHOUT MITIGATION MEASURES



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



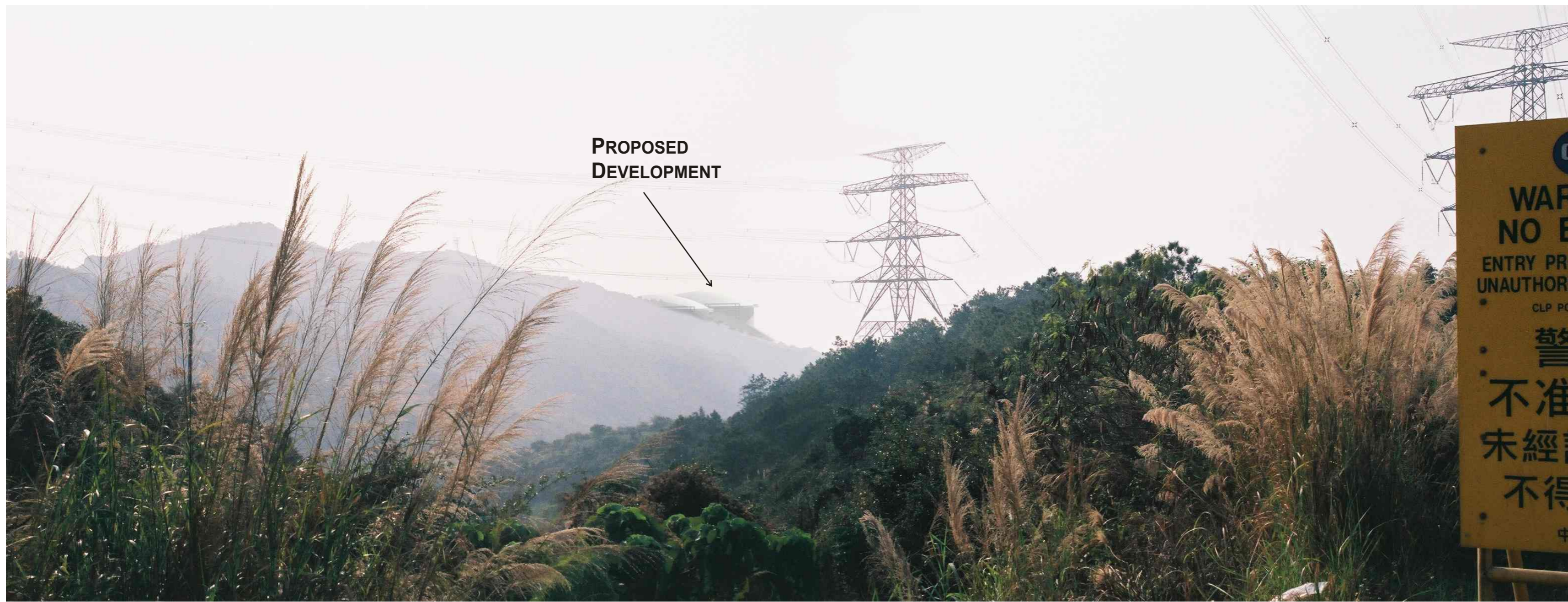
VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

**FIGURE 11.30  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 4**

VISUALLY SENSITIVE RECEIVER 4  
VIEW FROM LUNG MUN ROAD  
GPS: EASTING: 809406.92  
NORTHING: 830217.31  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 1,226M

**LNG TERMINAL BLACK POINT LVIA**

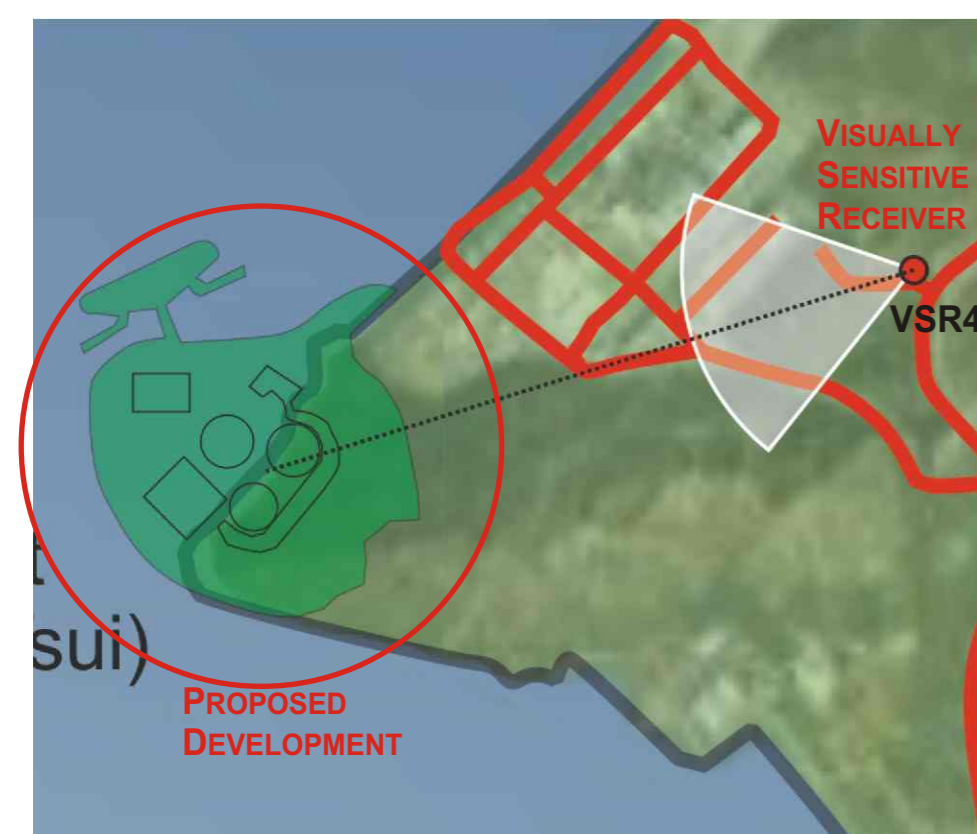




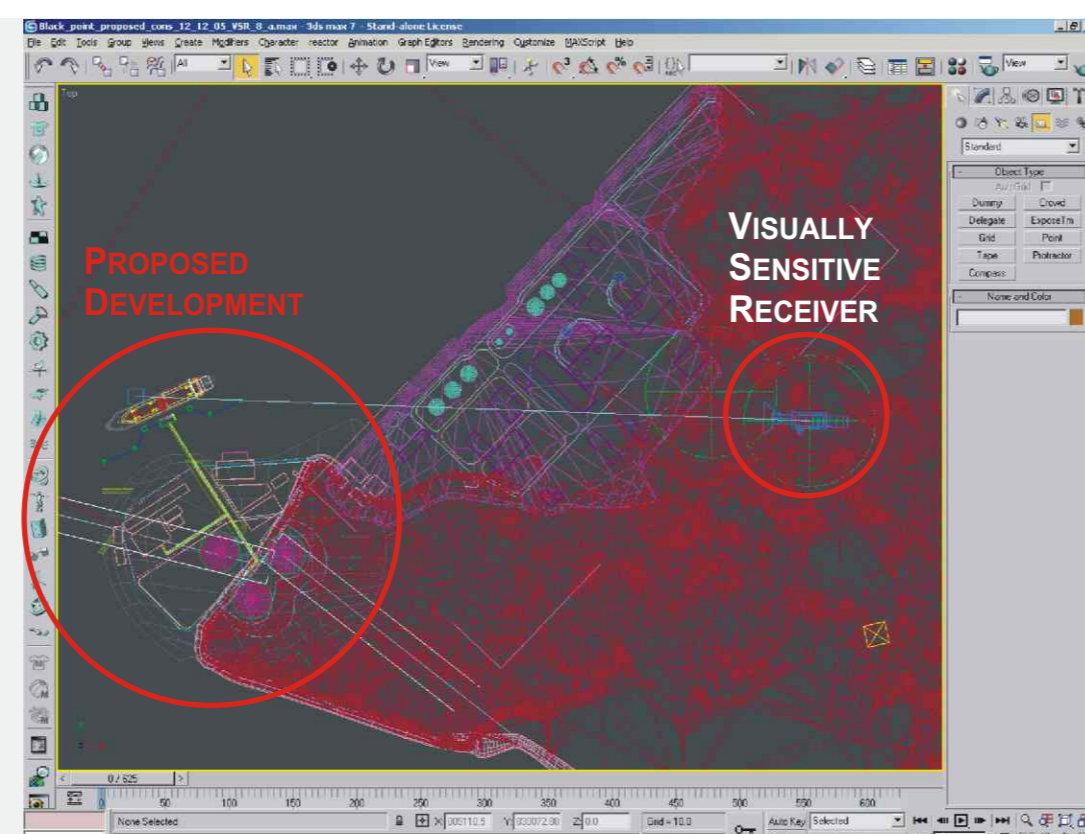
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITH MITIGATION MEASURES



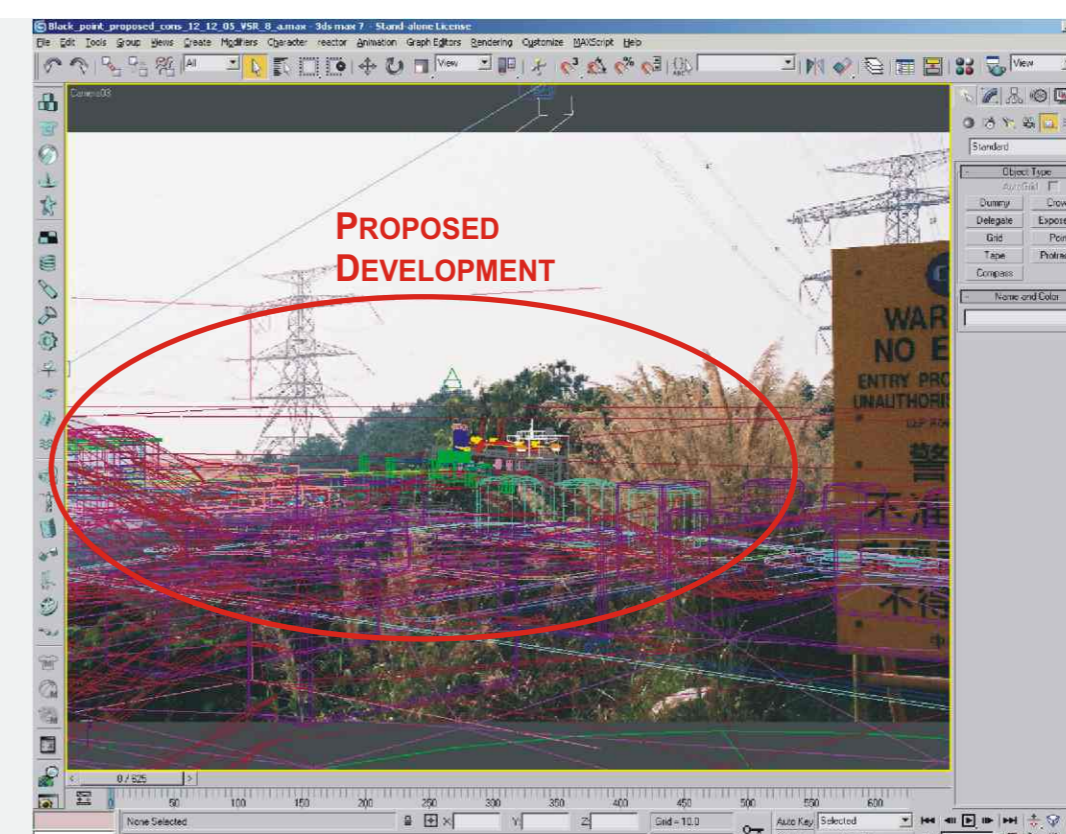
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT YEAR 10 WITH MITIGATION MEASURES



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

**FIGURE 11.30A  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 4**

**VISUALLY SENSITIVE RECEIVER 4  
VIEW FROM LUNG MUN ROAD**  
GPS: EASTING: 809406.92  
NORTHING: 830217.31  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 1,226M

LNG TERMINAL BLACK POINT LVIA

### 11.17.5 VSR5 – View from Lung Mun Road

This VSR is also from the road network and was selected as the topography and break in vegetation may provide views towards the site. This viewpoint is 1555 metres south east of the site.

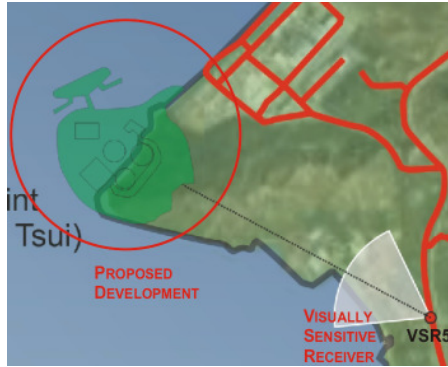


Figure 11.31 VSR5 Lung Mun Road

Vegetation and the existing infrastructure (container storage facility) affect visibility to the site and therefore the terminal is not visible from this viewpoint.

Table 11.16 Sensitivity / Quality of VSR

Value and quality of view	Low
Visitor numbers	Medium
Availability and amenity of alternative views	Medium
Duration and frequency of views to facility	Short and variable
Degree of visibility	Low
Sensitivity/Quality of VSR	Low

Table 11.16a Magnitude of Change

	Construction	Operation
Compatibility with surrounding landscape	Medium	Medium
Potential blockage of view	Low	Low
Distance to Terminal	1,555 metres	1,555 metres
Duration of impacts	Temporary	Permanent
Scale of development	Medium	Medium
Reversibility of change	Irreversible	Irreversible
Magnitude of change	Negligible	Negligible

Table 11.16b Significance Threshold during Construction

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

Table 11.16b Significance Threshold during Operation

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

The Terminal will not be visible from this viewpoint due to existing vegetation and therefore the visual impact will be *negligible*.



EXISTING CONDITION LOOKING NORTH WEST TOWARDS THE DEVELOPMENT FROM BESIDE STORAGE FACILITY (LUNG MUN ROAD).



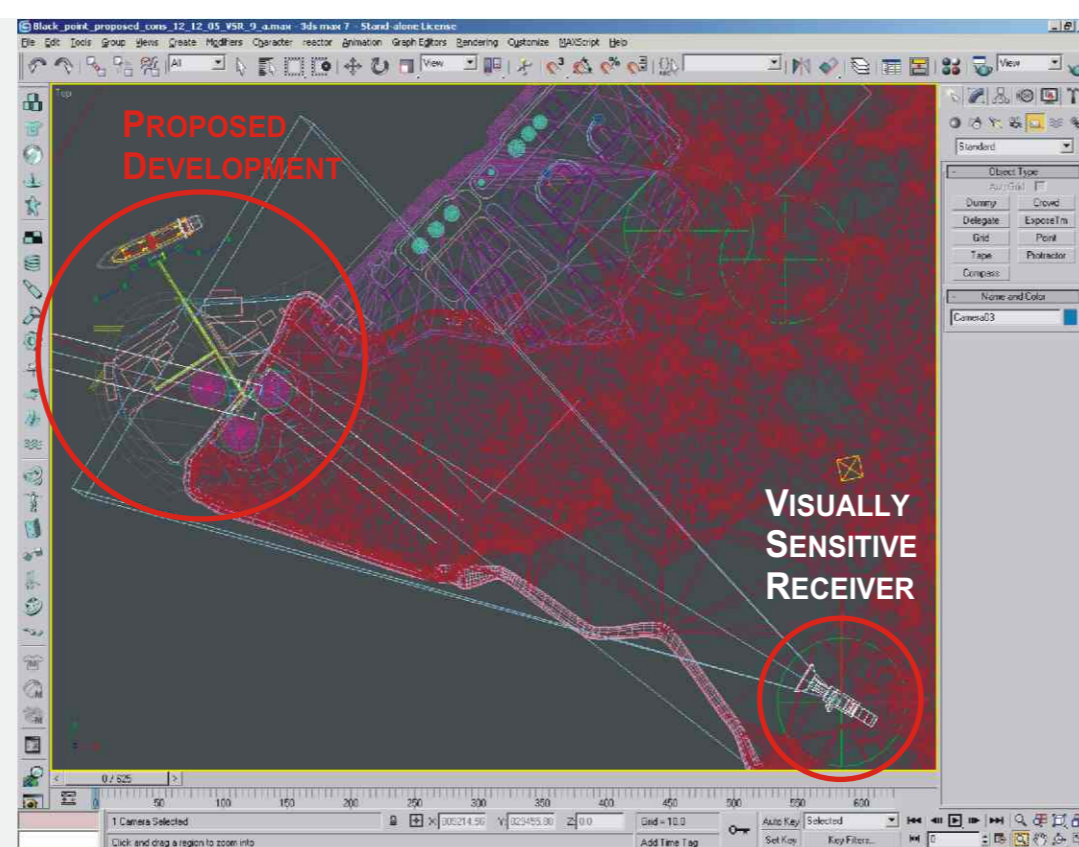
WIREFRAME VIEW OF THE PROPOSED DEVELOPMENT AND THE DIGITAL TERRAIN MODEL COMPOSITED ONTO THE PHOTOGRAPHS.



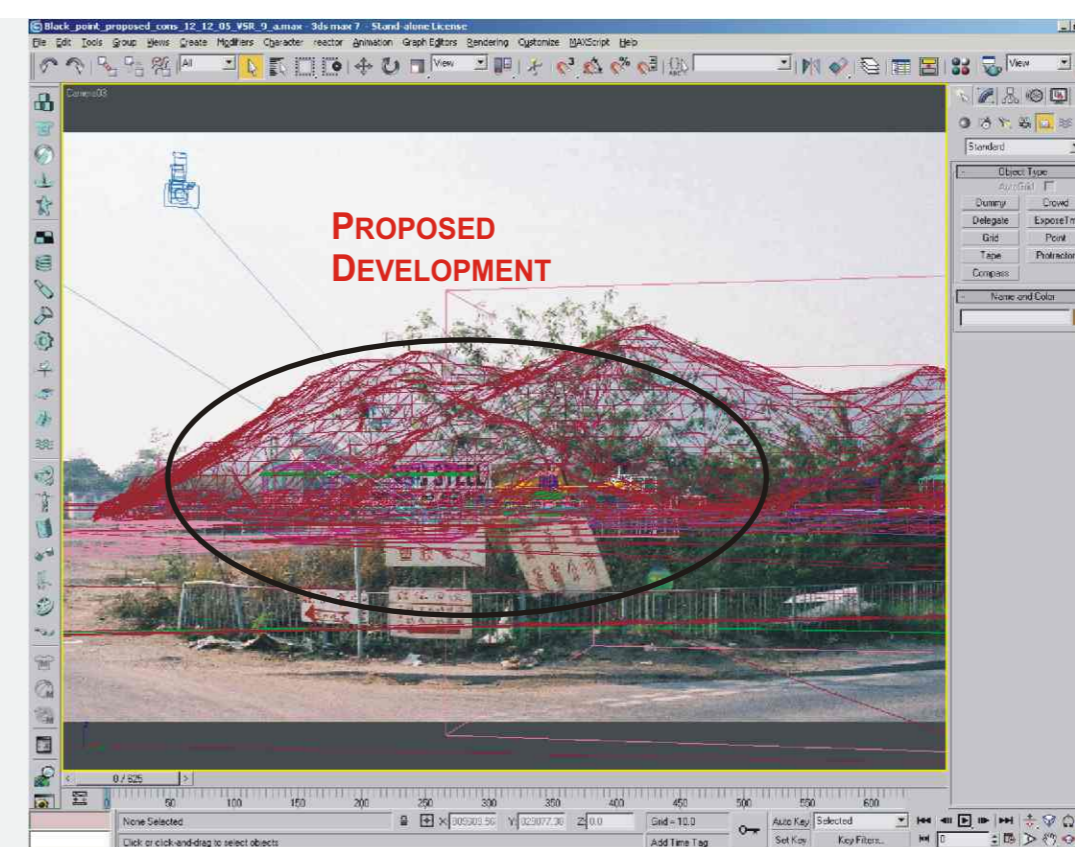
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITHOUT MITIGATION MEASURES



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



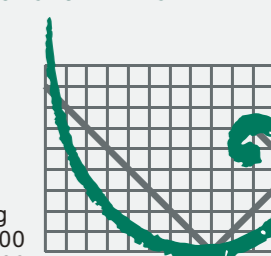
PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

**FIGURE 11.32**  
**PHOTOMONTAGE**  
**VISUALLY SENSITIVE**  
**RECEIVER 5**

**VISUALLY SENSITIVE RECEIVER 5**  
**VIEW FROM BESIDE STORAGE FACILITY (LUNG MUN ROAD)**  
 GPS: EASTING: 809547.70  
 NORTHING: 829120.16  
 GRID DATUM: HK 1980  
 DISTANCE FROM DEVELOPMENT: 1,556M





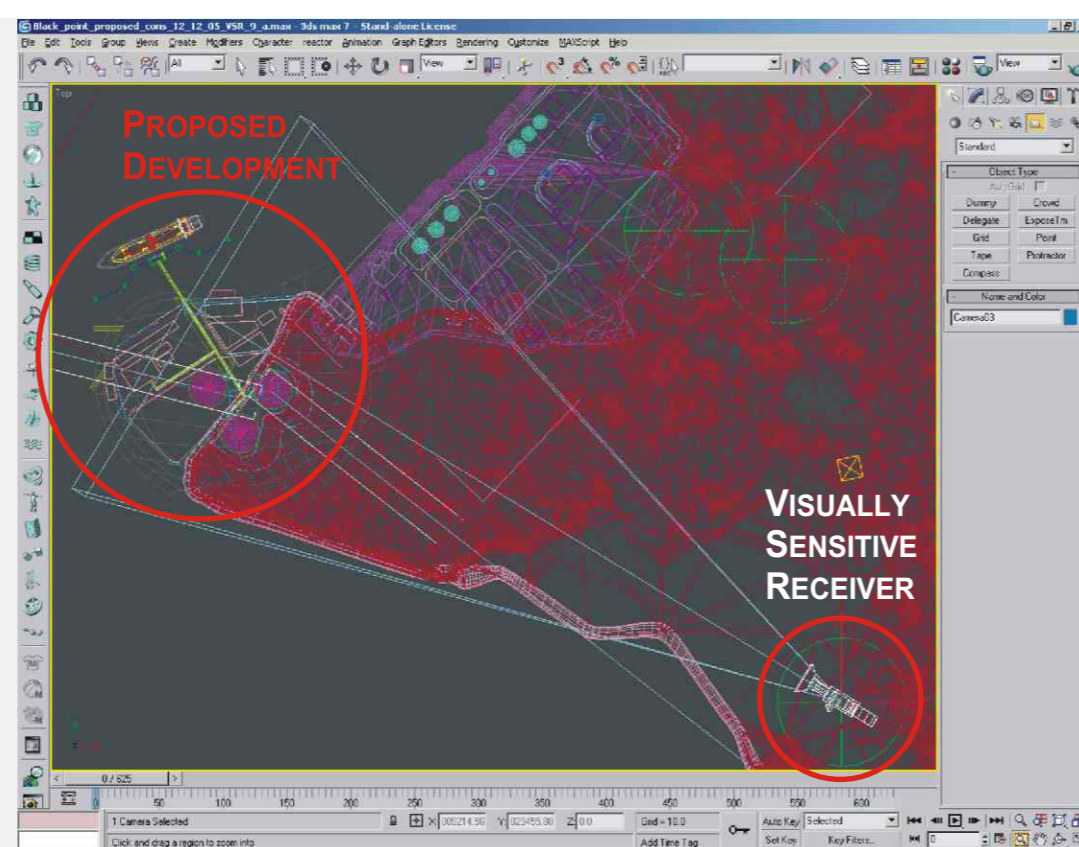
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITH MITIGATION MEASURES



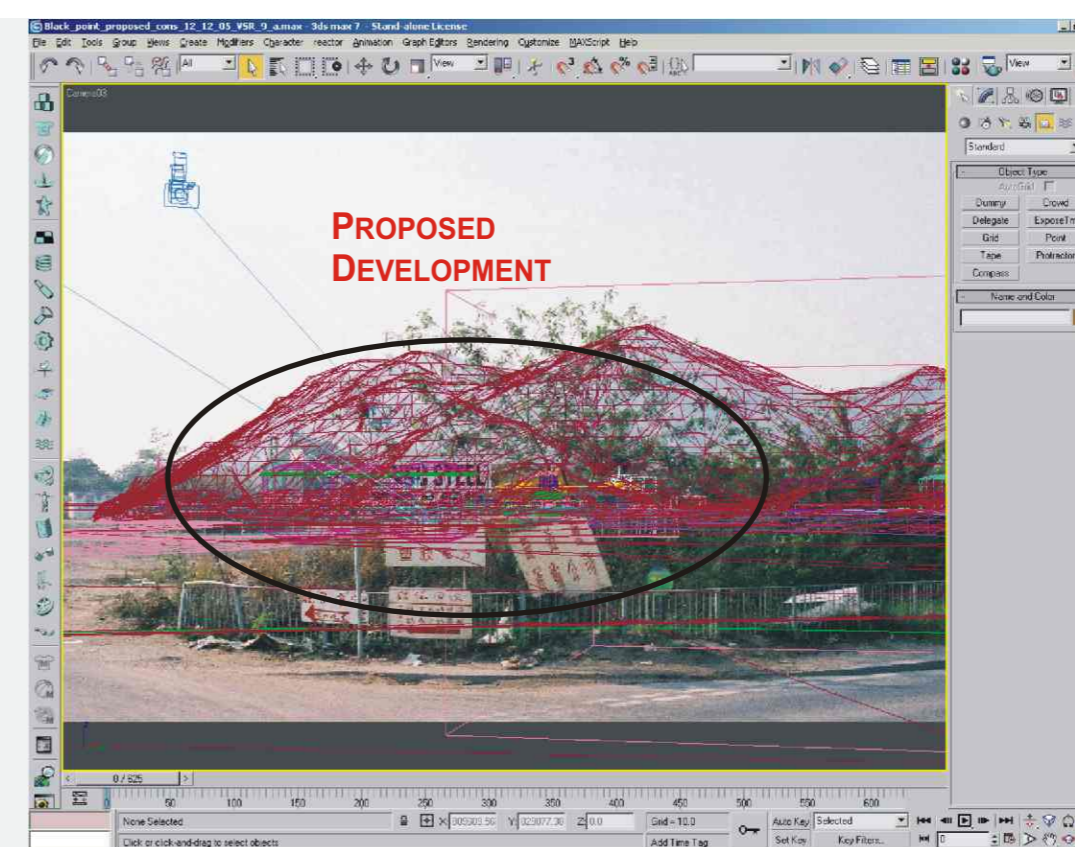
VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT YEAR 10 WITH MITIGATION MEASURES



MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.



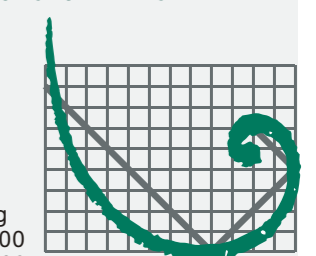
PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.



VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.

**FIGURE 11.32A  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 5**

**VISUALLY SENSITIVE RECEIVER 5**  
VIEW FROM BESIDE STORAGE FACILITY (LUNG MUN ROAD)  
GPS: EASTING: 809547.70  
NORTHING: 829120.16  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 1,556M



## 11.17.6 VSR6 – View from Lung Kwu Chau

Lung Kwu Chau is a remote island located 3650 m to the south west of the site. At this distance atmospheric affects are an important consideration.

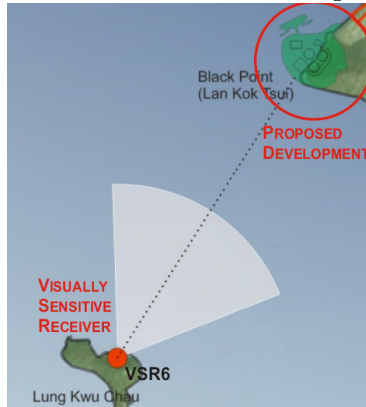


Figure 11.33 VSR6 Lung Kwu Chau

Photomontage 6 on the following page shows that from Lung Kwu Chau, the proposed terminal will be visible on clear days.

Table 11.17 Sensitivity / Quality of VSR

Value and quality of view	High
Visitor numbers	Low
Availability and amenity of alternative views	High
Duration and frequency of views to facility	Short and Variable
Degree of visibility	High
Sensitivity/Quality of VSR	High

Table 11.17a Magnitude of Change

	Construction	Operation
Compatibility with surrounding landscape	Low	Low
Potential blockage of view	Medium	Medium
Distance to Terminal	3,650 metres	3,650 metres
Duration of impacts	Temporary	Permanent
Scale of development	Medium	Medium
Reversibility of change	Irreversible	Irreversible
Magnitude of change	Intermediate	Intermediate

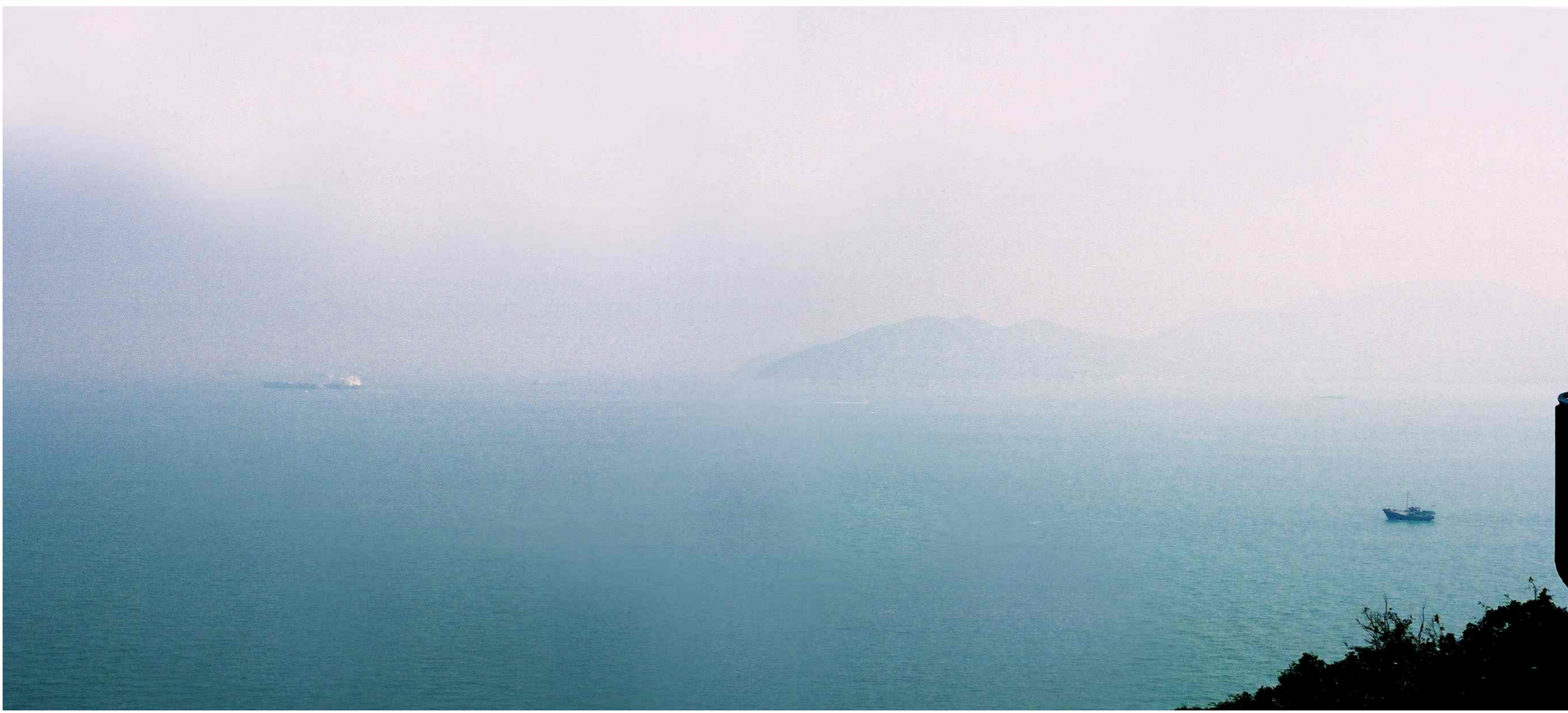
Table 11.17b Significance Threshold during Construction

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

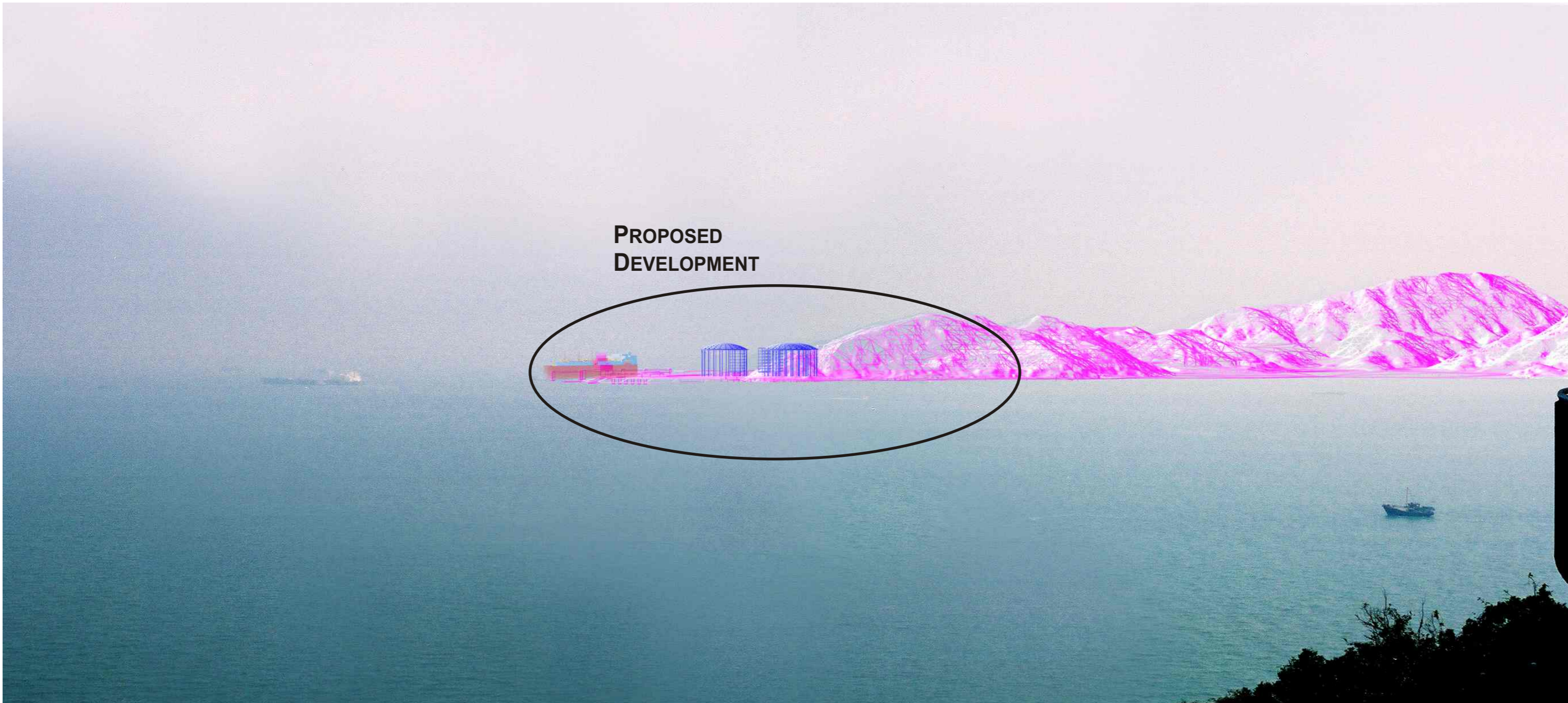
Table 11.17b Significance Threshold during Operation

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

There will be a *Moderate-Significant* impact from Lung Kwu Chau on days of clear visibility. However this impact will be reduced due to the low user numbers.



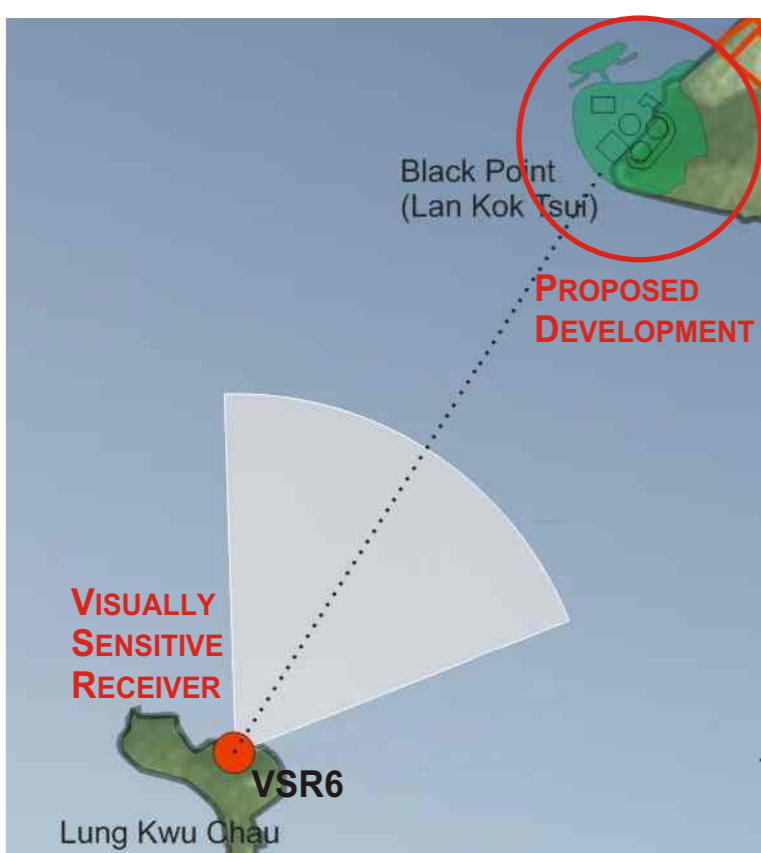
**EXISTING CONDITION LOOKING NORTH EAST TOWARDS THE DEVELOPMENT FROM LUNG KWU CHAU HELIPAD.**



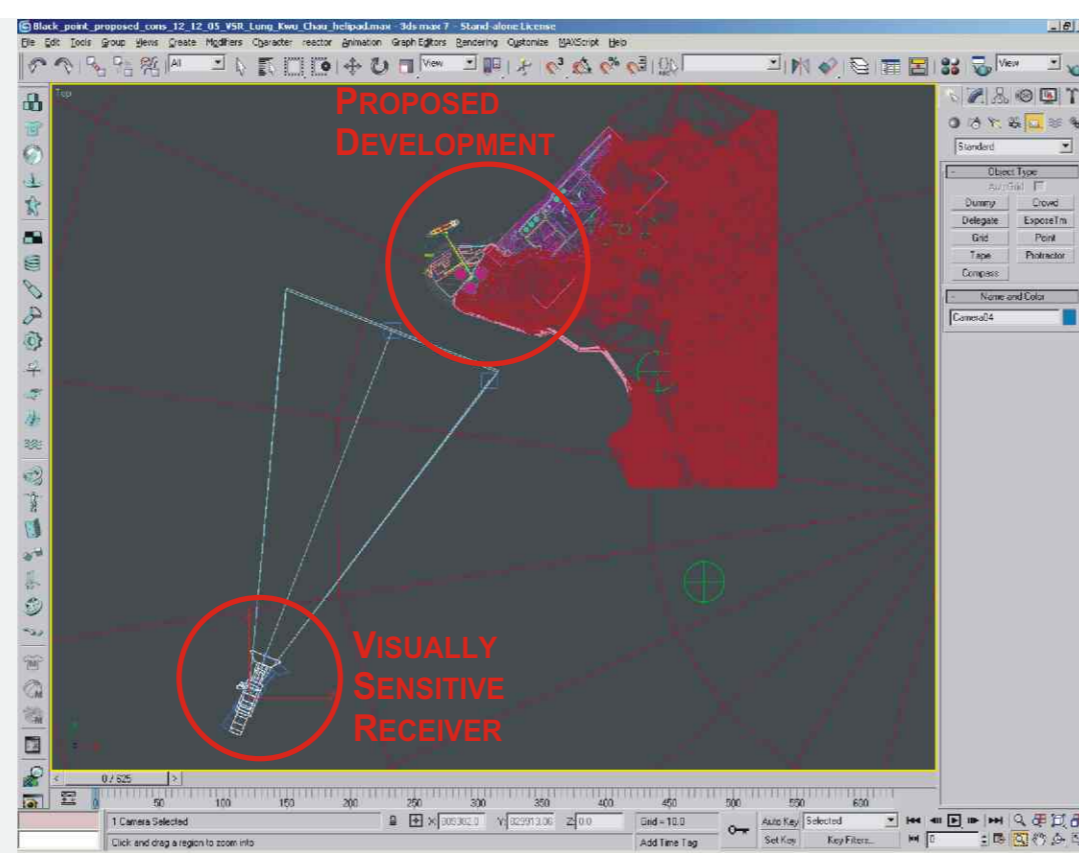
**WIREFRAME VIEW OF THE PROPOSED DEVELOPMENT AND THE DIGITAL TERRAIN MODEL COMPOSITED ONTO THE PHOTOGRAPHS.**



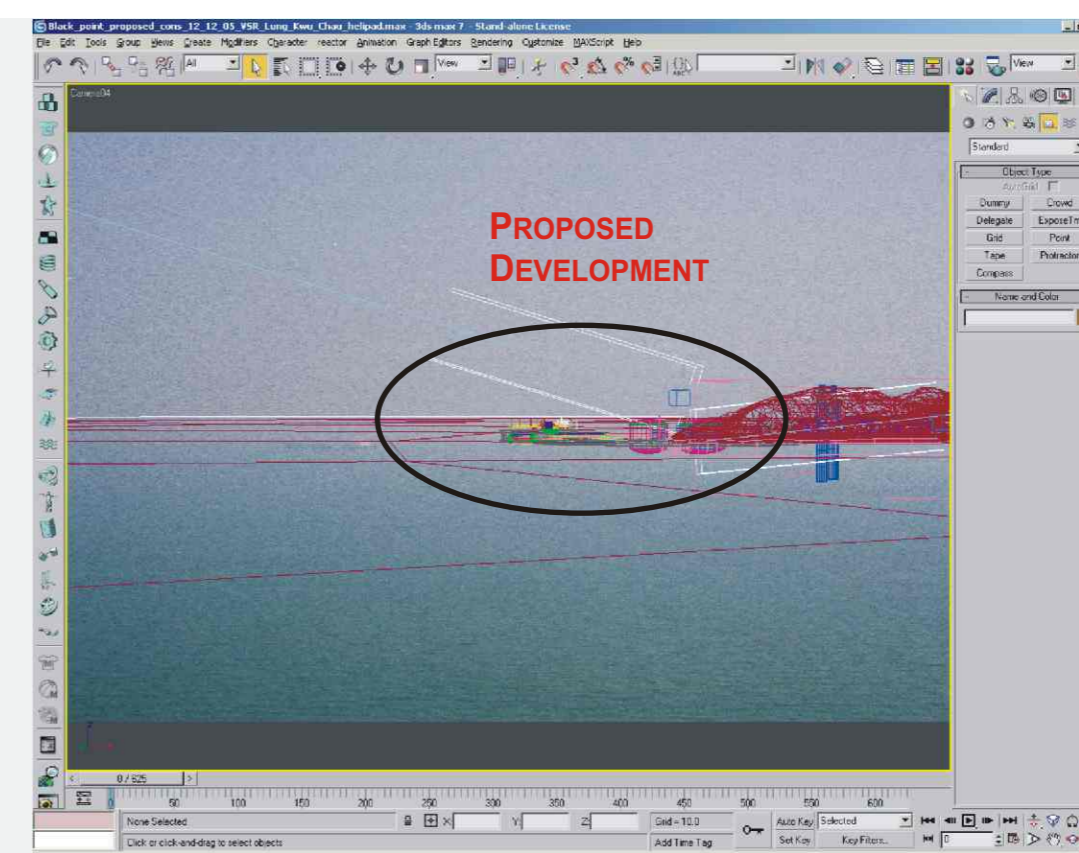
**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITHOUT MITIGATION MEASURES**



**MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.**



**PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.**



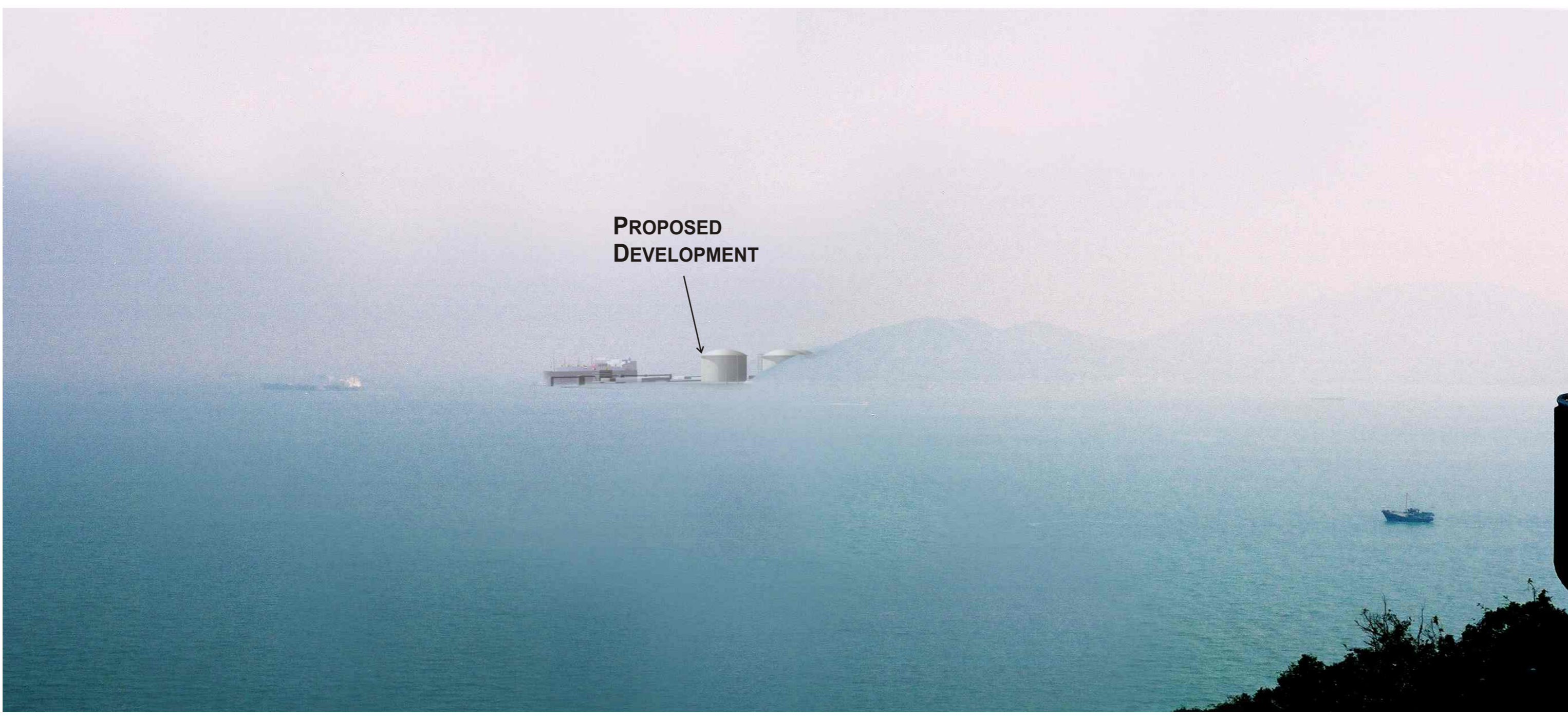
**VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.**

**FIGURE 11.34  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 6**

**VISUALLY SENSITIVE RECEIVER 6  
VIEW FROM LUNG KWU CHAU HELIPAD**  
GPS: EASTING: 806296.0  
NORTHING: 826515.31  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 3,648M

**LNG TERMINAL BLACK POINT LVIA**

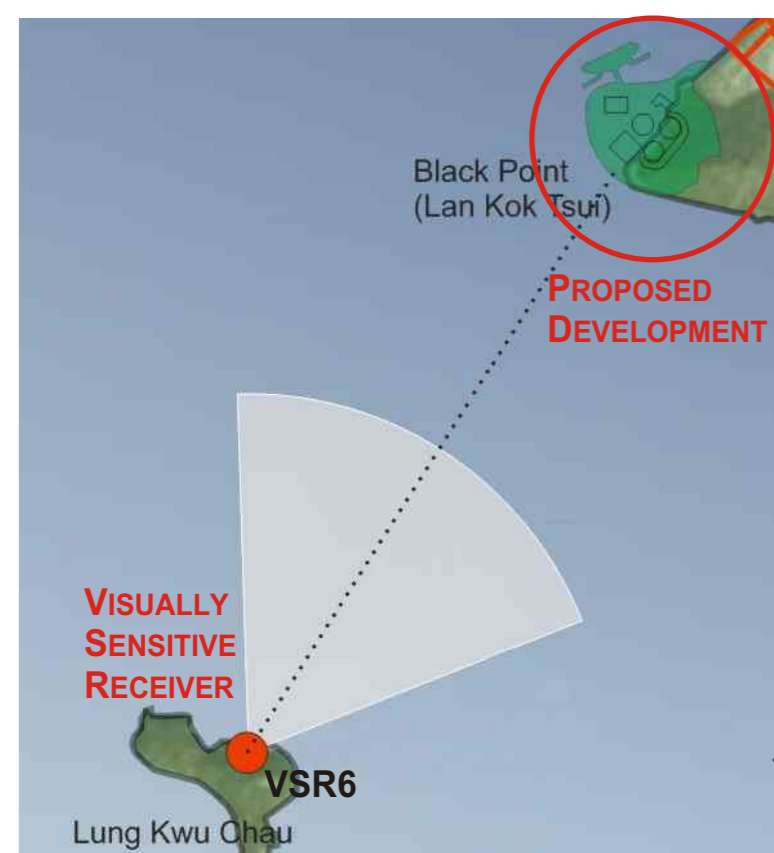




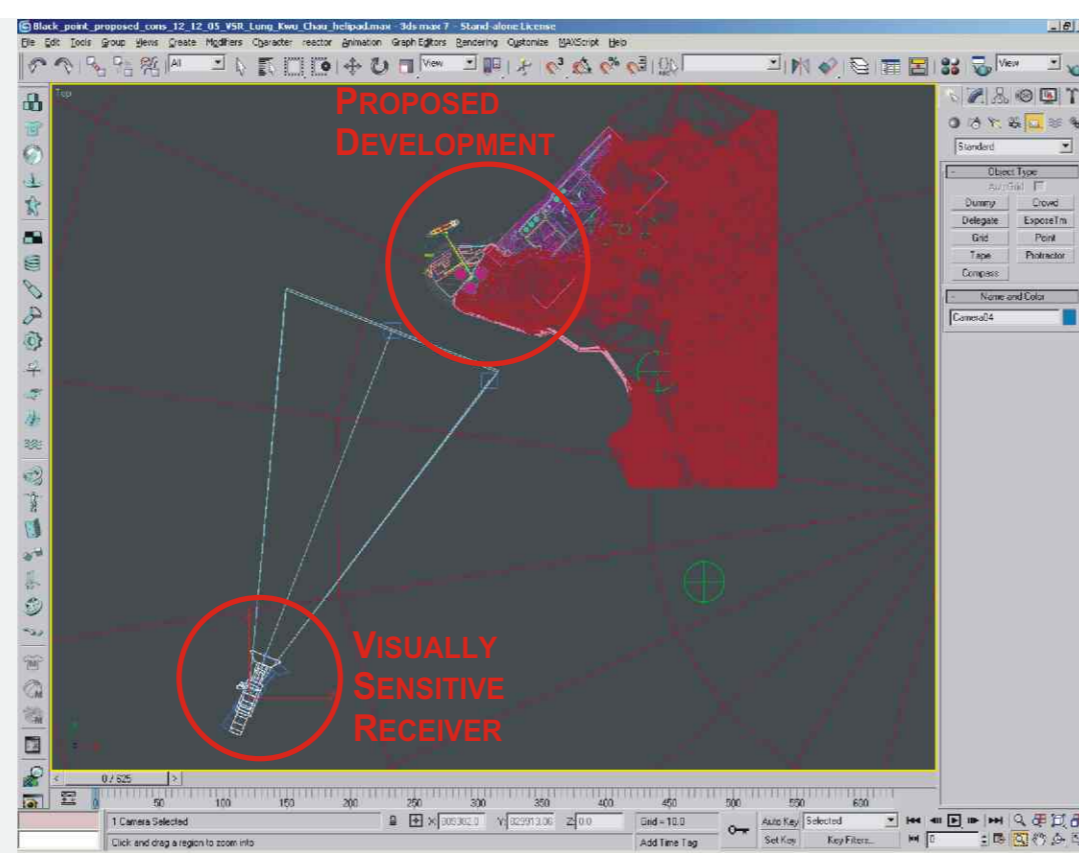
**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT DAY 1 WITH MITIGATION MEASURES**



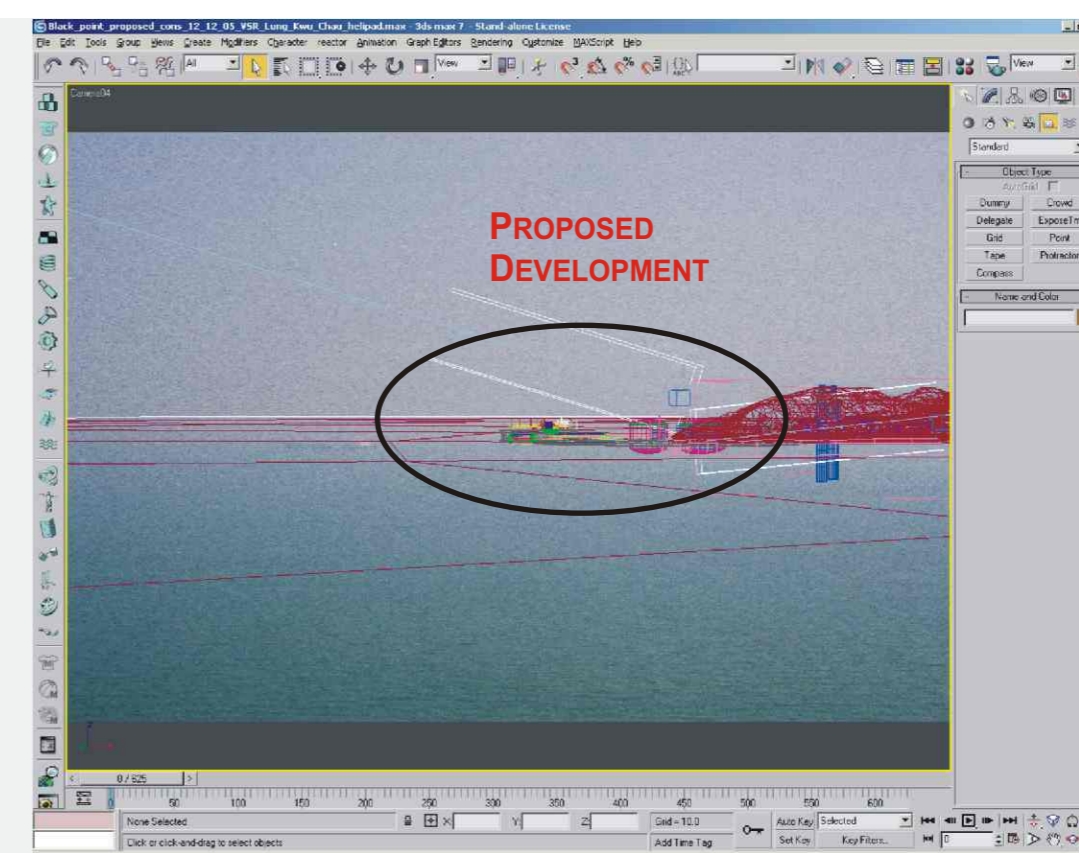
**VIEW DISPLAYING THE 3D MODEL OF THE PROPOSED DEVELOPMENT YEAR 10 WITH MITIGATION MEASURES**



**MAP DISPLAYING THE PROPOSED DEVELOPMENT LOCATION AND VISUALLY SENSITIVE RECEIVER LOCATION.**



**PLAN VIEW OF THE 3D MODEL SHOWING THE LOCATION OF THE VISUALLY SENSITIVE RECEIVER FROM WHICH THE PHOTOGRAPH WAS TAKEN AND THE LOCATION OF THE PROPOSED DEVELOPMENT.**



**VIEW FROM THE 3D VIRTUAL CAMERA SHOWING THE DIGITAL TERRAIN MODEL AND THE MODEL OF THE PROPOSED DEVELOPMENT COMPOSITED ONTO THE SITE PHOTOGRAPH.**

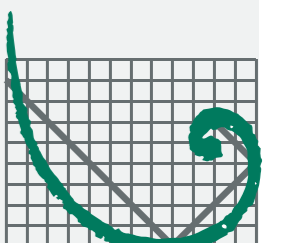
**FIGURE 11.34A  
PHOTOMONTAGE  
VISUALLY SENSITIVE  
RECEIVER 6**

**VISUALLY SENSITIVE RECEIVER 6  
VIEW FROM LUNG KWU CHAU HELIPAD**  
GPS: EASTING: 806296.0  
NORTHING: 826515.31  
GRID DATUM: HK 1980  
DISTANCE FROM DEVELOPMENT: 3,648M

**LNG TERMINAL BLACK POINT LVIA**

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Project No. 0018180  
February 2006

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## 11.18 VISUAL MITIGATION MEASURES

The final detailed Visual Mitigation Measures will be the subject of a Landscape Master Plan that will be submitted for approval to the relevant Authority prior to construction.

For those VSR's that may experience an impact, the following Visual Mitigation Measures (VMM's) are proposed to reduce these impacts and provide a potential enhancement of visual quality.

### *VMM 1 Design of Structures*

Where possible, building structures will utilise appropriate design to complement the surrounding landscape. Materials and finishes will be considered during detailed design.

### *VMM 2 Colours*

Colours for the terminal will be used to complement the surrounding area to the extent possible. Colours such as shades of light grey, and light brown may be utilised to reduce the visibility of the terminal where technically feasible.

### *VMM 3 Plantings*

In addition to the landscape mitigation plantings proposed earlier in this report, appropriate new plantings will be installed to help integrate the new structures into the surrounding landscape.

### 11.18.1 *Alternative Site Layouts*

Section 2 of this EIA discusses the layout changes to the Black Point Terminal that have been undertaken in order to provide a comparison and therefore reduce the visibility of the major visible elements.

### 11.18.2 *Mitigated Visual Impacts*

Table 11.18 predicts the potential mitigated visual impacts during construction and operation. It also predicts the mitigated visual impacts during construction, day 1 and year 10 of operation.

Table 11.18 Mitigated Visual Impacts

VSR	Un-Mitigated Visual Impact		Recommended Mitigation	Mitigated Impacts		
	Construction	Operation		Construction	Operation Day 1	Operation Year 10
1 Lung Tsai Beach	Slight-Moderate	Slight-Moderate	VMM 1-3	Slight-Moderate	Slight-Moderate	Slight-Moderate
2 Ferry Lane	Moderate	Moderate	VMM 1-3	Moderate	Moderate	Moderate
3 Above Black Point	Slight	Slight	VMM 1-3	Slight	Slight	Slight
4 Elevated section of Lung Mun Road	Slight	Slight	VMM 1-3	Slight	Slight	Slight
5 Lung Mun Road	Negligible	Negligible	Nil	Negligible	Negligible	Negligible
6 Lung Kwu Chau	Moderate-Significant	Moderate-Significant	VMM 1-3	Moderate-Significant	Moderate-Significant	Moderate-Significant

### 11.19 SUMMARY OF VISUAL IMPACTS

Of the 6 VSR's assessed, there will be a Moderate-Significant impact on VSR6 Lung Kwu Chau, a moderate impact on VSR2 Ferry Lane, a slight-moderate impact on VSR 1 Lung Tsai Beach, slight impacts from VSR3 Above Black Point and VSR4 Elevated Section of Lung Mun Road and a negligible impact from Lung Mun Road.

### 11.20 NIGHT LIGHTING AND GLARE

The above analysis examined the visual impacts of the proposal during daylight hours. While detailed lighting plans and specifications are not available at this preliminary design stage, the following lighting practices will be considered during the detailed design stage.

While detailed lighting plans and specifications are not available at this preliminary design stage, the following lighting practices should be considered during the detailed design stage:

- **Security lighting of the site boundary.** These will generally be spot lights mounted on the external fencing and will have the beams directed towards the ground.
- **General access lighting.** This will provide safe access and operational lighting conditions around the site. Baffles will be fitted where possible to reduce upward light spill.
- **Emergency lighting.** These lights will provide safe levels of illumination to facilitate evacuations or repairs in emergency situations. The use of these lights will be infrequent.
- **Aviation lighting.** It is anticipated that some lighting will be required at the tops of the storage tanks and vent stacks to provide aviation safety. These lights are typically flashing coloured lights. Whilst visible from large distances, they will not have a large contribution to the overall ambient light levels of the site.

#### 11.20.1 Distances between Source lighting and VSR's.

Due to its remote location and the location of Black Point Headland Hill acting as a natural visual barrier, the visibility of individual light fittings between the affected VSR's and the terminal is expected to be low, with any aviation lighting on the tops of the tanks being the most visually prominent lights.

It should also be noted that some of the climatic conditions discussed in Section 11.12.5 also apply to light visibility and are expected to reduce night time visibility. These include rain events and sea haze. However, very

occasionally, cloud cover can increase the visibility of night lighting in the form of reflected light. This tends to occur when a heavy cover of low cloud sits above the site and consequently reflects the light from beneath.

#### 11.20.2 *The Surrounding Ambient Light of the VSR*

Night lighting from the source is more highly visible when one is observing in darkness. As the surrounding ambient light increases, the visibility of distant objects reduces. This includes viewers in cars, near street lights, or inside illuminated homes. Viewers looking towards the site in complete darkness are expected to be low in number.

#### 11.20.3 *The Surrounding Lighting Conditions of the Source.*

There are numerous sources of existing lighting from Black Point Power Station and the nearby industrial facilities.

#### 11.20.4 *Visual impact of night time lighting*

The above analysis indicates that potential lighting impacts will typically be low. This is due to the following:

- The lighting for the proposal will generally be spot lights angled downwards and no large scale flood lighting is proposed;
- Most views towards the site will occur in areas with significant ambient lighting levels, therefore greatly reducing the visibility of distant lights;
- There is substantial lighting associated with the nearby industrial facilities;
- All of the major light sources will be pointed inward and downwards to reduce light spill.

## 11.21 LANDSCAPE CHARACTER AREAS

Four Landscape Character Areas (LCA's) have been identified according to the existing baseline conditions and the ability of the area to incorporate change.

### *LCA 1 Black Point Coastal Uplands*

This LCA comprises of the vegetated hill slopes with occasional protruding rocky outcrops. The vegetation is made up of shrubland and shrubby grasslands. There is a transmission tower near the summit of Black Point.



*Figure 11.35 Black Point Coastal Uplands*

*LCA 2 Black Point Industrial Urban Landscape*

The existing Black Point Power Station dominates this Landscape Character Area. It generally consists of berthing areas, chimney stacks and industrial infrastructure.



*Figure 11.36 Black Point Industrial Urban Landscape*

*LCA 3 Offshore Waters Landscape*

The Offshore Waters are characterized by large open expanses of ocean with scattered off shore islands. There are also passing marine vessels, mostly container ships. These areas experience high degree of remoteness.



*Figure 11.37 Offshore Waters Landscape*



#### *LCA 4 Inshore Waters Landscape*

The Inshore Waters experience a greater interaction with LCA 1 as the coastline visually enclose the inshore waters areas. This LCA tends to be calmer than LCA 3 with a reduced sensation of remoteness as the coastline offers sanctuary to the elements.



*Figure 11.38 Inshore Waters Landscape*

### 11.21.1 Factors Affecting the Sensitivity of the LCA's

In order to assess the impact the LNG Terminal will have on the Landscape Character of Black Point, it is important to establish how sensitive the landscape is to change. Generally, the more natural the landscape character, the higher the sensitivity. The following factors will have an affect on the sensitivity of the Landscape Character Areas.

- The general landscape quality and landscape elements of the area;
- The importance and rarity of the area or special features;
- The ability of the LCA to accommodate change;
- Significance of the change in a local and regional context; and
- The maturity of the landscape.

**Table 11.19 Landscape Character Sensitivity Matrix**

	LCA 1 Coastal Uplands	LCA 2 Industrial Urban	LCA 3 Offshore Waters	LCA 4 Inshore Waters
<b>Quality of L/S Character</b>	High	Low	High	High
<b>Importance/Rarity</b>	Medium	Low	Medium	High
<b>Ability to accommodate Change</b>	Medium	High	Low	Low
<b>Significance</b>	Medium	Low	Medium	Medium
<b>Maturity</b>	High	Low	High	High
<b>Overall Sensitivity</b>	<i>Medium</i>	<i>Low</i>	<i>High</i>	<i>High</i>

### 11.21.2 Factors Affecting The Magnitude of Change to the LCA's

To establish how large the impact will be on the LCA's, a number of factors must be considered. These include:

- The projects compatibility with the surrounding landscape;
- Duration of the impacts under construction and operation
- The scale of the development (relative to the baseline conditions of the LCA), and
- The reversibility of change.

**Table 11.20** Landscape Character Magnitude of Change Matrix

	LCA 1 Coastal Uplands	LCA 2 Industrial Urban	LCA 3 Offshore Waters	LCA 4 Inshore Waters
<b>Compatibility</b>	Low	High	Low	Low
<b>Duration of Impacts (Construction)</b>	App. 2yrs	App. 2yrs	App. 2yrs	App. 2yrs
<b>Duration of Impacts (Operation)</b>	Indefinite	Indefinite	Indefinite	Indefinite
<b>Scale of Development</b>	Large	Large	Large	Large
<b>Reversibility</b>	Low	Low	Low	Low
<b>Magnitude of Change</b>	<i>Intermediate</i>	<i>Small</i>	<i>Intermediate</i>	<i>Negligible</i>

The above table shows that there will be an Intermediate magnitude of change on the LCA's 1 and 3, a small magnitude of change on LCA2 and a negligible change on LCA4. This is illustrated in *Figures 11.39 and 11.40*

## 11.22 LANDSCAPE CHARACTER IMPACTS

LCA 1 – Coastal Uplands

Table 11.21 LCA 1 Coastal Uplands Matrix

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

The table above shows that there will be a *moderate-significant* impact on the landscape character of the Black Point Coastal Uplands.

LCA 2 – Industrial Urban Landscape

Table 11.22 LCA 2 Industrial Urban Landscape

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

There will be a *slight* impact on the landscape character of the Industrial Urban Landscape. This is due to the presence of the existing industrial facilities.

**LCA 3 – Offshore Waters Landscape**

Table 11.23 LCA 3 Offshore Waters Landscape

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

There will be *medium-significant* impact on the landscape character of the Offshore Waters areas.

**LCA 4 – Inshore Waters Landscape**

Table 11.23 LCA 4 Inshore Waters Landscape

		Sensitivity / Quality			Beneficial
		Low	Medium	High	
Magnitude of Change	Large	Moderate Impact	Moderate - Significant impact	Significant impact	Adverse
	Intermediate	Slight-Moderate impact	Moderate Impact	Moderate – Significant impact	
	Small	Slight impact	Slight – Moderate impact	Moderate impact	
	Negligible	Negligible impact	Negligible impact	Negligible impact	

There will be a *negligible* impact on the landscape character of the Inshore Waters Landscape areas.

## 11.23

**LANDSCAPE CHARACTER MITIGATION MEASURES**

All of the Landscape Mitigation Measures proposed in *section 11.10* along with the Visual Mitigation Measures proposed in *section 11.18* will also mitigate the impacts on the LCA's. The final detailed Landscape and Visual Mitigation Measures will be the subject of a Landscape Master Plan that will be submitted for approval to the relevant Authority prior to construction.

A summary of the effectiveness of these measures in reducing the LCA impacts is provided below:

*LMM 1 – Cultivation of areas compacted during construction.* This will assist in the re-vegetation of these areas. This will contribute to establishing more native plants that are found in the Black Point Coastal Uplands LCA

*LMM 2 – Soil stabilisation and planting.* The addition of vegetation on the cut slopes will reduce the visibility of the slopes and therefore assist in the ability of the LCA's to accommodate the project

*LMM 3 – Tree and shrub planting.* This will contribute to the vegetation common to the Black Point Coastal Uplands LCA.

*LMM4 – Utilising natural rock for reclamation.* This will help integrate the edge of the reclamation into the natural rocky edge of the Black Point area which will reduce impacts to LCA's 3 and 4.

*LMM5 – Cut Stabilisation.* Where the use of shot-crete is un-avoidable, the addition of pigments will help to reduce the visibility of the cut-slopes.

*LMM6 – Bench Plantings.* The addition of vegetation on the cut slopes will reduce the visibility of the slopes and therefore assist in the ability of the LCA's to accommodate the project

*LMM7 – Early Planting Works.* This will help to reduce impacts as early as possible.

*LMM8 – Site hoardings to be compatible with the surrounding environment.* This will help to reduce the impacts of the terminal during construction.

*VMM 1 Design of Structures* – The sensitive design of structures will help to complement Black Point Coastal Uplands LCA.

*VMM 2 Colours* – The selection of suitable complementary colour will help the LCA's accommodate the terminal.

*VMM 3 Plantings* - Plantings will reduce the visibility of the tanks and the scale of the terminal.

*Design Measures* – Reducing the tank height from 70PD to 61m PD will reduce the scale of the terminal.

### 11.23.1 *Avoidance*

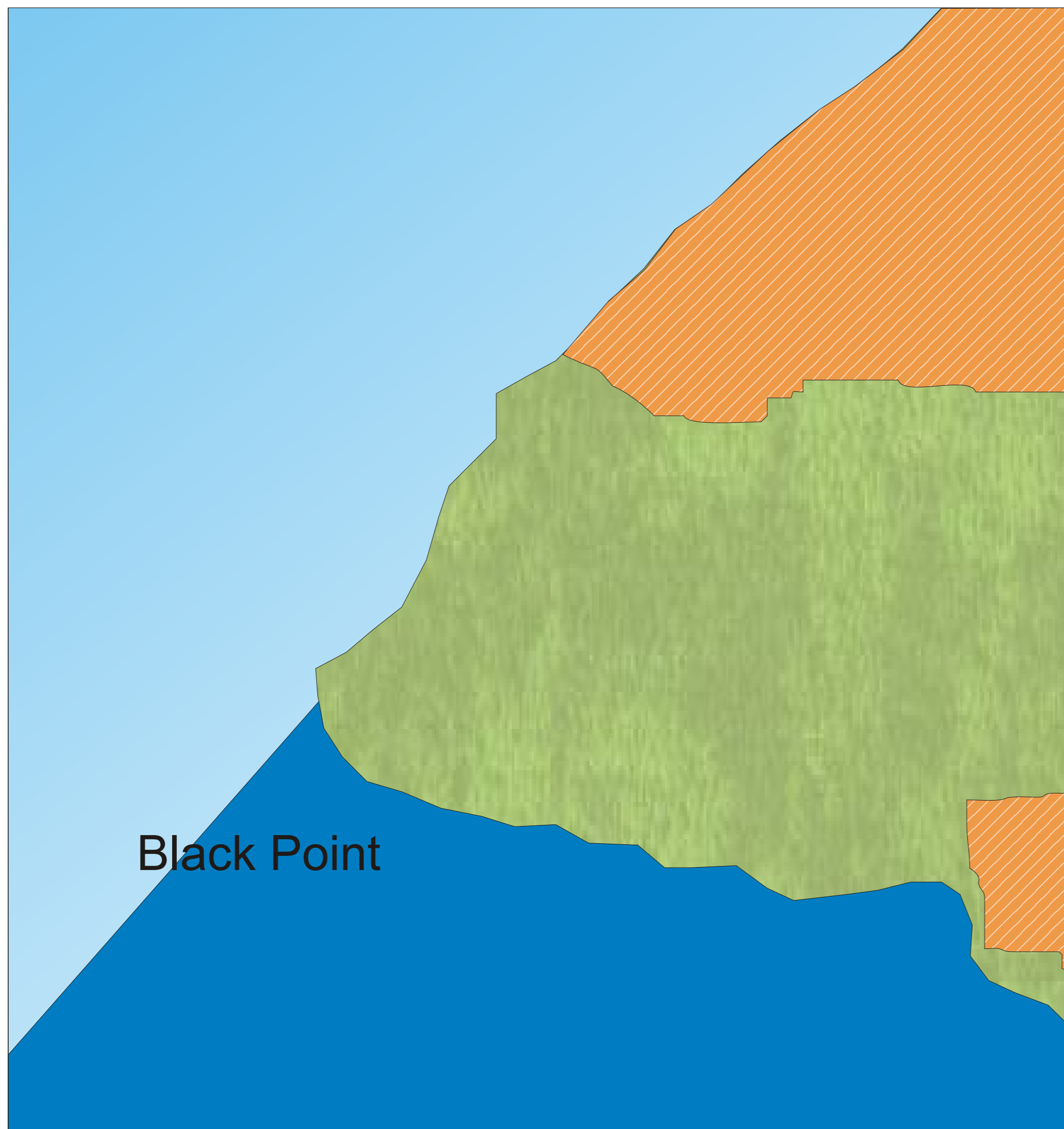
The refinements discussed in *section 11.2* of this report show how the potential impacts on the Landscape Character of Black Point have been mitigated. The impacts on the Landscape Character have been reduced by:

- The reduction of the extent of the reclamation;
- The clustering of the tanks closer together;
- The positioning of the tanks into the hill side of Black Point;
- The overall reduction in the scale of the terminal.




11.24 LCA Mitigated Landscape Character Impacts

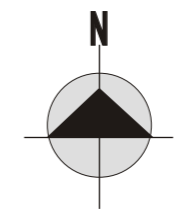
LCA	Un-Mitigated Landscape Impact		Recommended Mitigation	Mitigated Impacts		
	Construction	Operation		Construction	Operation Day 1	Operation Year 10
1 Black Point Coastal Uplands	Moderate-Significant	Moderate-Significant	All	Moderate-Significant	Moderate-Significant	Moderate
2 Black Point Industrial Urban Landscape	Slight	Slight	All	Slight	Slight	Negligible
3 Offshore Waters Landscape	Moderate-Significant	Moderate-Significant	All	Moderate-Significant	Moderate-Significant	Moderate
4 Inshore Waters Landscape	Negligible	Negligible	Nil	Negligible	Negligible	Negligible





**LEGEND**

-  LCA1 - Coastal Upland & Hillside Landscape
-  LCA2 - Industrial Urban Landscape
-  LCA3 - Offshore Water Landscape
-  LCA4 - Inshore Water Landscape

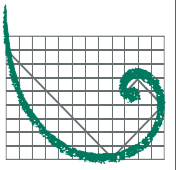


Scale 1:2,500 (A3)



**BLACK POINT**  
**Fig 11.39 Landscape**  
**Character Areas**  
**Existing Conditions**





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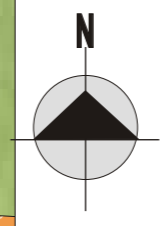


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**LEGEND**

-  LCA1 - Coastal Upland & Hillside Landscape
-  LCA2 - Industrial Urban Landscape
-  LCA3 - Offshore Water Landscape
-  LCA4 - Inshore Water Landscape



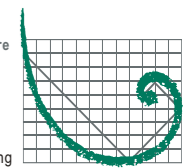
Scale 1:2,500 (A3)



**BLACK POINT**  
**Fig 11.40 Landscape**  
**Character Areas**

**Proposal Before Mitigation**

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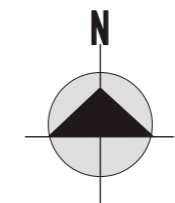


**LEGEND**

- LCA1 - Coastal Upland & Hillside Landscape
- LCA2 - Industrial Urban Landscape
- LCA3 - Offshore Water Landscape
- LCA3 - Inshore Water Landscape

Proposed Industrial Area (Unmitigated)

**Black Point**



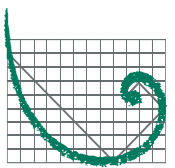
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**BLACK POINT**  
**Fig 11.41 Landscape Character Areas**  
**Proposal After Mitigation**

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Table 11.24 above shows that when all Landscape and Visual Mitigation Measures are in place, along with the mitigating conditions of the improved design of the terminal, the impacts on the :LCA's will reduce one order of significance threshold.

#### 11.24 CUMULATIVE IMPACTS

At present there are no committed projects that could have cumulative impacts with the construction of the terminal at Black Point.

#### 11.25 EVALUATION OF RESIDUAL ENVIRONMENTAL IMPACTS

Taking into consideration the baseline landscape, landscape character and visual conditions and along with the mitigation measures, residual impacts have been identified occurring as a result of the proposed terminal

Section 4.4.3 of the Technical Memorandum identifies a number of factors that are to be considered when considering residual impacts. These are outlined in Table 11.25. For the purposes of the evaluation, an overall assessment of the impacts on the LR's, LCA's and VSR's has been carried out. It must also be noted that this assessment is based on the overall impacts.

Table 11.25 Residual Impact Analysis

Evaluation Criteria	Residual Impact Type		
	Landscape Resources (LR's)	Landscape Character Areas (LCA's)	Visual Impacts (VSR's)
<i>Effects on Public health and health of biota or risk to life</i>	No effects applicable to LR's	No effects applicable to LCA's	No effects applicable to VSR's
<i>The magnitude of the adverse environmental impacts</i>	Overall the impacts on the LR's will be moderate	Overall there will be negligible-moderate impacts on the LCA's.	Overall the impacts on the VSR's will be slight-moderate with some more significant impacts in close proximity to the terminal.
<i>The geographic extent of the adverse environmental impacts</i>	The impacts on the LR's will be confined to the works area of Black Point	The impacts on Landscape Character will be confined to the Black Point area	The larger impacts in the VSR's will be largely confined to areas in close proximity to Black Point
<i>The duration and frequency of the adverse environmental impacts</i>	The impacts on the LR's will be for approximately 4 years during terminal construction.	The impacts on LCA's will be continuous for as long as the project exists.	The visual impacts will be continuous for as long as the project exists.
<i>The likely size of the community or the environment that may be affected by the adverse impacts</i>	The area of the affected environment will be the works area of Black Point.	The impacts on Landscape Character will be confined to the Black Point.	Visitors to or near Black Point.
<i>The degree to which the adverse environmental impacts are reversible or irreversible</i>	During operation the impacts on the LR's are irreversible. Construction phase impacts can be mitigated through landscaping measures.	During operation the impacts on the LCA's are irreversible. Construction phase impacts can be mitigated to the full extent practicable.	During operation the impacts on the VSR's are irreversible.
<i>International and regional importance</i>	The adverse impacts on the LR's do not affect an issue of international or regional concern.	The landscape character of the Black Point is valued by recreational visitors to the area. There will be moderate adverse impacts to the existing landscape character of Black Point.	The visual quality of Black Point is valued by recreational visitors to the area. There will be moderate to moderate-significant adverse impacts to the existing visual quality when the terminal is viewed at close range.
<i>Both the likelihood and degree of uncertainty of adverse environmental impacts</i>	The detailed assessment shows there are no uncertainties regarding the impacts on the LR's	The detailed assessment shows there are no uncertainties regarding the impacts on the LCA's	The detailed assessment shows there are no uncertainties regarding the impacts on the VSR's

Table 11.25 above shows that the impacts on the Landscape Resources will have no effect on public health and are confined to the works area at Black Point. No areas of international or regional importance are affected and there are no uncertainties regarding the impact.

The impacts on the LCA's will have no effect on public health and they are considered to be generally moderate in magnitude. The impacts will be confined to areas in close proximity to Black Point. Whilst the impacts are irreversible construction phase impacts can be mitigated to the full extent practicable. There are no adverse residual impacts on the terrestrial ecology of the area. The landscape character of Black Point is valued by several sections of the public and there will be some adverse impacts on this landscape character. However this impact will be limited to the Black Point Area. There are no uncertainties regarding the impact.

The impacts on the VSR's will have no effect on public health, they will be generally moderate in magnitude and will mostly be confined to areas in close proximity to Black Point. There are no residual adverse impacts on areas of international or regional importance and there are no uncertainties regarding the impact. While the VSR at Lung Kwu Chau will experience moderate-significant visual impact, the impact will only affect a small number of visitors to Lung Kwu Chau. Therefore the overall visual impact from the project is considered acceptable.

## 11.26

## CONCLUSION

- Compensatory planting of indigenous species will mitigate the effects of the development on many of the Landscape Resources. The effects on the rocky shoreline can be partially mitigated by the use of natural rock in the reclamation areas. The overall residual impacts on the Landscape Resources are assessed as *slight-moderate*.
- There will be very limited views of the terminal from most land based viewing locations and these impacts will range from *negligible* to *slight-moderate*. The visual impacts will be larger for the ocean based VSR's with *moderate* impacts from the Ferry Lane and *moderate-significant* impacts from Lung Kwu Chau. However following consideration of the lower user numbers in these areas and the analysis of the residual impacts, the overall visual impact is assessed as *slight-moderate*.
- Potential night time glow and visibility of maritime and aviation lighting may be visible on clear nights from Lung Kwu Chau and the Ferry Lane viewing locations. However given that significant lighting already exists at Black Point Power Station and other nearby industrial facilities the additional night lighting from the proposed LNG terminal is considered acceptable.
- The Landscape Character Impacts range from *negligible* to *moderate*. After consideration of the residual impacts, the overall Landscape Character impacts are assessed as *slight*.

According to the *Technical Memorandum on the Environmental Impact Assessment Process (EIAO-TM)* the Landscape and Visual Impacts are considered *acceptable with mitigation*.