

APPENDIX 10

LANDSCAPE CHARACTER AND VISUAL EFFECTS

Port Lyttelton Recovery Plan

Landscape Report

Prepared for Lyttelton Port Company by Boffa Miskell Ltd

10 November 2014



Boffa Miskell

Document Quality Assurance

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1.0 Introduction

Lyttelton Port Company (LPC) has commissioned Boffa Miskell Ltd (BML) to prepare a Landscape Report on the Port of Lyttelton Earthquake Recovery Plan (Recovery Plan). The purpose of this report is to undertake an assessment of landscape and visual effects to assist with the preparation of the Recovery Plan. The assessment framework in this report is guided by the Direction and the purpose of the Canterbury Earthquake Recovery Act (CER Act). In particular, how the Recovery Plan provides for the efficient, timely and effective repair, rebuild and restoration and enhancement of Lyttelton Port in a way that restores social, economic, cultural, and environmental well-being.

A traditional Resource Management Act (RMA) assessment, against the purpose of that Act and relevant RMA planning documents is considered inadequate to assess the proposal against the CER Act. However to undertake this assessment, the Direction requires an assessment of the proposal against the “relevant considerations” of the RMA and other documents. This report undertakes a high level assessment of the proposal against the relevant parts of these documents to the extent that these documents provide guidance for the type of values and factors that should form part of an assessment of the Recovery Plan proposal.

The purpose of the Lyttelton Port Recovery Plan is to address the recovery of the port. This includes the repair, rebuild and reconfiguration needs of the port, and its restoration and enhancement, to ensure the safe, efficient and effective operation of Lyttelton Port and supporting transport networks.

This report is based on information provided by LPC and other project team members and addresses the following:

- Description of the site, context and character
- Description of the proposal
- Statutory context
- Assessment of landscape and visual effects
- Recommendations for measures to manage potential landscape outcomes
- Summary and conclusions.

The Recovery Plan involves the repair and redevelopment of Lyttelton Port areas from Naval Point to Otokitoki/Gollans Bay, on Banks Peninsula. Refer to **Figure 1** in the accompanying **Appendix 3 Graphic Attachment**. This is illustrated and described in the Port Lyttelton Plan (PLP) which forms the basis for stakeholder consultation and the project description for the preparation of this report.

2.0 Site Location, Context and Character

2.1 Site Location

For the purposes of this assessment 'the Site' refers to Lyttelton Port and the surrounding coastal marine area defined as the 'Geographic Extent of Lyttelton Port Recovery Plan' in Map A of the New Zealand Gazette, No. 65 (19 June 2014), Canterbury Earthquake Recovery Act 2011. This area includes all land in the Lyttelton Port area owned, occupied or used by Lyttelton Port Company Limited at the date of the direction, including pockets of land within that geographic area under separate ownership and the area immediately south of Norwich Quay. Refer to **Figure 2**.

The Site is located in Lyttelton Harbour - *Te Whakaraupo*, on Banks Peninsula, Canterbury. Lyttelton Harbour is the South Island's major commercial deep water port. It is the hub port for the South Island for the container trade and is well-located for the distribution of cargoes nationally and internationally. The Port is serviced by many international shipping lines and is an important component of the regional economy. The Site extends for a length of approximately 4.5 kilometres from Gollans Bay to Naval Point along the coastal edge near Lyttelton Township. The Site area and layout of proposals are shown on **Figures 1, 2 and 3** in the accompanying graphic attachment.

2.2 Site Context

To assist with understanding the potential landscape outcomes of the proposed Recovery Plan it is important to understand the landscape context within which the Site is located.

The Banks Peninsula Landscape Study (BPLS) prepared by Boffa Miskell in 2007, identifies Lyttelton Harbour as a broad area comprising 3 geological land areas - the Lyttelton volcanics, the pre-Lyttelton volcanics and the Northern Mt Herbert volcanics. These areas define and characterise this previously volcanic landscape of the harbour. Steep rocky slopes characterise the upper volcanic caldera rim with smoother and gentler lower colluvial slopes drop to indented harbour edges. This creates a visually defined harbour landscape.

The water body of the Harbour itself can be broadly divided into upper, middle and outer areas. The Upper Harbour is centred on Quail Island and surrounding bays. The Outer Harbour extends from approximately Ripapa Island and Battery Point to the Heads. The Middle Harbour extends between the settlements of Diamond Harbour and Lyttelton Township and defines a transitional area between the Upper and Outer Harbours. The Site is located within this Middle Harbour area.

Westward of Diamond Harbour and Lyttelton Township, the Upper Harbour is characterised by settlements that have overtime extended to parts of the upper slopes of the harbour landscape. Eastward, there are few settlements except for rural dwellings on the southern side of the harbour and small settlements at Purau and Camp Bays. The Outer Harbour is more exposed to coastal weather with a stronger

natural character. It has a history of military defence with remnant gun emplacements, tunnels and other structures on headlands and vantage points.

Landforms within the harbour are dramatic with rocky outcrops expressing the volcanic origins of the landscape. These include the jagged caldera ridgeline, exposed bands of layered volcanic rock formations (stratigraphy), outcrops of vertical dikes and landforms of solidified lava flows. This rugged underlying landscape has been eroded over time to form lower pastoral hills, spurs and bluffs descending to the indented coastal harbour edge. The harbour has a complex edge of small peninsulas and headlands, inlets and shallow mudflats, and Quail Island emerging within the Upper Harbour.

Vegetation cover around the harbour is mixed with predominantly modified and exotic grassland and forestry species. This reflects the sheep farming and forestry activities that have developed over time. Remnant native vegetation is dispersed throughout the harbour with some significant patches being located in areas such as Tauhinukorokio and Buckleys Bay Scenic Reserve.

These elements and characteristics combine to create an overall visually coherent caldera landscape with a fine grain of complex bays, vegetation and landforms, and attractive settlement areas. The Port of Lyttelton is a visually apparent large element of this landscape located between the Upper and Outer Harbours and closely associated with Lyttelton and Diamond Harbour townships.

2.3 Site Character

Lyttelton Port and Township are located on the north side of the harbour and extend from approximately Naval Point to Gollans Bay in the east. Lyttelton occupies part of the steep, south facing, inner flanks of the ancient Lyttelton volcanic crater. Radial spurs descend from the crater rim forming a natural amphitheatre that spatially and visually encloses the township. The spurs have a soft, rounded form though the uppermost slopes are lined with occasional rocky bluffs and dotted with large rock outcrops.

The upper south-facing slopes remain largely undeveloped and primarily in semi-improved grasslands and regenerating native tussocklands and scrublands. There is also a large area of pine forest in a prominent position on the spur above Sticking Point and the Sumner Road. Much of the regenerating native vegetation lies within Department of Conservation land and is part of the Port Hills recreation area with several walking tracks extending through it.

The Port of Lyttelton is the location where the first European settlers arrived in Canterbury. The site of the first landing is identified at approximately the corner of Norwich Quay and Oxford Street. The settlement pattern of Lyttelton Township radiates out from the Port with the historic planned road grid-pattern at its core. Some early cottages and other historic buildings remain since the Christchurch 2010-2011 earthquake sequence. These reflect the early European heritage and add to the unique character of the place. It can be anticipated that this built character is likely to change with the future rebuild of the town centre.

The working Port creates an active industrial character to the coastal edge of the town. Historic reclamation has created areas of flat industrial and storage land. Overtime, the coastline between Naval/Erskine Point and Battery Point has been heavily modified by Port activities creating artificial flat land, headlands and harbour coastal edges as well as an Inner Port area. The historic natural coastal bluffs and edges are still clearly apparent where the slopes meet the flat reclaimed land of the Port.

From Naval Point to Battery Point the current Port activities broadly include:

- a recreation marina and boat access area at Naval Point,
- a fuel unloading and storage area at the “Tank Farm”,
- a dry dock and maintenance area for boats,
- an inner port recreation marina,
- ship berthing and unloading and loading of logs, cars and other cargo at Piers 2-7,
- a ferry terminal to Quail Island and Diamond Harbour,
- a container port with large cranes approximately 80m in max height and storage areas,
- a coal storage and loading area, and
- a land reclamation near Battery Point in Te Awaparahi Bay.

Beyond Battery Point is Gollans Bay Quarry which is also part of the Site. Gollans Bay is a broad, linear and shallowly indented bay with steep uniform slopes and bluffs. The backdrop to this bay is a quarry that is visibly benched into the cliffs below Evans Pass Road and originally supplied rock for the Cashin Quay reclamation.

The 2010/2011 earthquakes severely damaged the Port removing the full use of many areas of piers and wharves. Visiting cruise ships have ceased to berth at Lyttelton Port and the Port has a reduced capacity to handle cargo. This has left some areas appearing abandoned and awaiting repair or demolition. Within the Cashin Quay area re-piling of the wharves has commenced with large cranes and pole structures present.

3.0 The Recovery Proposal

For the purposes of this assessment the project is described in **Appendix 1: The Recovery Plan**. This has been relied on for undertaking this landscape assessment. **Figure 3 – Port Lyttelton Plan** in the graphic supplement identifies the spatial locations of areas described in the Recovery Plan.

The **Port Lyttelton Plan** sets out LPC's 30 year vision for the repair, rebuild, enhancement and reconfiguration of the port. A large number of construction projects are required as part of the vision, and these are expected to occur over a period of approximately 12-15 years. These construction projects will enable the port to continue to reconfigure to meet the growing freight demands for the next 30 years as well as providing community access to the waterfront.

4.0 Statutory Planning Context

A full assessment of the legal and planning context is documented elsewhere in the Recovery Plan. The statutory framework relating to landscape and visual matters for this assessment are identified below.

4.1 Canterbury Earthquake Recovery Act 2011 (CERA)

On 19 June 2014, the Minister of Earthquake Recovery, by way of a Gazette Notice, directed Lyttelton Port Company Limited and Canterbury Regional Council to develop a Lyttelton Port Recovery Plan. This is to be undertaken in accordance with the process set out in the Direction and the CER Act. For the purposes of this landscape and visual assessment, relevant sections of the CER Act have been summarised. Relevant clauses from the Direction include:

- 5.1 *The matters to be addressed by the Lyttelton Port Recovery Plan must include, but are not limited to:*
- 5.1.1 *The recovery of the damaged port, including the repair, rebuild and reconfiguration needs of the port, and its restoration and enhancement, to ensure the safe, efficient and effective operation of Lyttelton Port and supporting transport networks;*
 - 5.1.2 ***The social, economic, cultural and environmental well-being of surrounding communities and greater Christchurch, and any potential effects with regard to health, safety, noise, amenity, traffic, the coastal marine area, economic sustainability of Lyttelton town centre and the resilience and well-being of people and communities including the facilitation of a focused, timely and expedited recovery;***
 - 5.1.3 *Implications for transport, supporting infrastructure and connectivity to the Lyttelton town centre, including, but not limited to, freight access to the port, public access to the inner harbour and the location of passenger ferry terminals and public transport stops;*
 - 5.1.4 ***The needs of users of Lyttelton Port and its environs, including, but not limited to, iwi, importers and exporters, cruise ship passengers and crew, tourism operators and customers, commercial fishers, recreational users and public enjoyment of the harbour and well-being of communities.***

- 6.5 *Lyttelton Port Company Limited must provide Canterbury Regional Council with all necessary information to enable preparation of a preliminary draft Lyttelton Port Recovery Plan, commensurate with the scale and significance of the recovery task and the complexity and interrelated nature of the recovery. This must include information to address the matters in clause 5 of this direction, and must also include, but is not limited to:*
- 6.5.1 ***A port redevelopment plan, clearly illustrating and describing the necessary repair, rebuild, reconfiguration, restoration and enhancement proposals to facilitate recovery, including timing and sequencing of recovery activity;***
 - 6.5.2 *Amendments to relevant instruments considered necessary to facilitate recovery;*
 - 6.5.3 *All relevant technical reports to support proposed amendments to relevant instruments, to the satisfaction of Canterbury Regional Council;*
 - 6.5.4 *A Cultural Impact Assessment;*
 - 6.5.5 *The first phase of an “Impact Assessment”, as required by section 7.1 of the Recovery Strategy for Greater Christchurch – Mahere Haumanatunga o Waitaha;*
 - 6.5.6 ***An assessment of the proposal against the Canterbury Earthquake Recovery Act 2011, relevant considerations of the Resource Management Act 1991, the New Zealand Coastal Policy Statement 2010, the Mahaanui Iwi Management Plan and other relevant statutory and non-statutory plans;***
 - 6.5.7 *A report on consultation undertaken. That report must list the parties consulted, state how consultation was undertaken, and summarise the information received and how it influenced the preparation of information and redevelopment plans; and*
 - 6.5.8 *A statement on staging and funding of the restoration and enhancement of Lyttelton Port, including implementation of relevant actions to effect recovery.*

5.0 Anticipated Landscape Outcomes & Assessment

The following section investigates the anticipated landscape and visual outcomes of the Recovery Plan from various locations around the site and surrounding context. The assessment is based on site visits, which included fieldwork on the harbour, around its margins, and in the vicinity of the site. Photographic views have been taken from key locations as part of

this assessment which are attached to this report as a graphic supplement. These photographs were taken using a Canon 6D digital camera with a 50mm lens setting. The graphic supplement should be read in conjunction with this assessment and includes the following sections:

To assist with understanding the visual effects of the Recovery Plan, four visualisations of the proposal have been prepared. These illustrate the anticipated location, extent and scale of the proposed Container Terminal and underlying reclamation from selected locations and do not necessarily depict the exact future reality. The methodology for preparing the simulations is included in the graphic supplement as **Figure 8 – Visualisation Methodology**. It is important to note that the Port's vision, as contained in the Port Recovery Plan and shown in the visualisations, is at its maximum anticipated extent. It is likely to take many years to be developed to this extent - possibly up to 30 years. The anticipated visual change will occur gradually over this time.

This assessment has been broken into the following section headings:

1. Assessment of Effects on the Natural Character of the Coastal Environment
2. Assessment of Effects on Natural Features and Landscapes
3. Assessment of Effects on Rural Amenity Landscapes
4. Assessment of Effects on Urban Landscape Amenity
5. Cultural and Historical Landscape
6. Lighting
7. Viewpoint and Visualisation Analysis

5.1 Assessment of Effects on the Natural Character of the Coastal Environment

The natural character of the coastal environment is an important consideration as part of assessing anticipated landscape impacts of the Recovery Plan. The presence of, and appreciation of, natural values in the landscape contributes to peoples' sense of well-being. The New Zealand Coastal Policy Statement (NZCPS) provides guidance for assessing coastal natural character by identifying attributes that contribute to people's sense of ecological and perceptual well-being. Human appreciation of natural coastal areas are strongly embedded in New Zealanders' identity and cultural backgrounds. Healthy ecological systems provide a strong sense of intrinsic environmental well-being. For these reasons a broad assessment of natural character impacts under the CER Act using the NZCPS guidance is appropriate. Under the NZCPS (Policy 13 Preservation of Natural Character, p.17), aspects of natural character may include:

- (a) *natural elements, processes and patterns;*
- (b) *biophysical, ecological, geological and geomorphological aspects;*
- (c) *natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks;*
- (d) *the natural movement of water and sediment;*

- (e) *the natural darkness of the night sky;*
- (f) *places or areas that are wild or scenic;*
- (g) *a range of natural character from pristine to modified; and*
- (h) *experiential attributes, including the sounds and smell of the sea; and their context or setting.*

Essentially, 'natural character' is a measure of the degree of human modification of a landscape seascape or ecosystem expressed in terms of ecological naturalness (indigenous nature) and landscape naturalness (perceptions of nature).

The NZCPS acknowledges that the coastal environment includes elements that contribute to the natural character, landscape, visual qualities or amenity values as well as physical resources and built facilities, including infrastructure, that have modified the coastal environment. The presence of a modified coastal natural character can also contribute to people's appreciation of well-being from other attributes such as potential amenity, economic benefits, social, cultural and historical associations.

The coastal natural character of Banks Peninsula, Lyttelton Harbour and the Port Hills has been assessed as part of the Banks Peninsula Landscape Study, 2007 prepared by Boffa Miskell. Within Lyttelton Harbour, the margins of the Outer Harbour from Pile Bay (south side) to the Adderley Head have been identified as having 'high natural character'. As part of the Christchurch City Plan, the north side of the harbour from Livingstone Bay to Godley Head (and over the Port Hills) has been assessed as an 'outstanding natural landscape'. This area has not been identified as having 'outstanding coastal natural character' (under the NZCPS Policy 13). It is likely to be an area of 'high natural character' consistent with the other side of the 'Outer Harbour' due to the impressive geological rocky cliffs, ecological values and recreational appreciation.

The Site is located within the coastal environment. It has not currently been identified as an area of high natural character in any past natural character studies or in the associated District Plans, which in turn have been developed to give effect to the Canterbury Regional Policy Statement. Therefore, the Recovery Plan avoids adversely affecting any outstanding coastal natural character areas (as per Policy 13(a) of the NZCPS). Refer to '**Figure 4: Context Plan**'.

The proposal would have some perceived visual impact on adjoining high natural character areas by introducing an increased scale and visibility of built Port infrastructure towards the east and Outer Harbour. This is an additional level of visual effect to existing infrastructure visible in the Harbour. The increase of 37 hectares of reclamation for the Container Terminal would be more visually apparent from within the Outer Harbour than the existing extent of Port infrastructure. This would adversely impact on the natural appearance of the outer harbour while not being out of character with the existing Port and not physically affecting identified areas of 'high coastal natural character'.

The reclamation for the proposed Container Terminal would have some adverse seascape, or experiential perception of the water. The natural character of the coastal margin adjacent to the proposed reclamation is highly modified and the reclamation is not likely to adversely affect this modified coastal area except in that the associated area of seascape would be reduced. This removal of harbour seascape cannot be mitigated, although the loss could be compensated for to some degree through natural character enhancement of the coastal environment in the vicinity of the reclamation. These could include:

- Natural coastal bluffs and cliffs from Gollans Bay to Cashin Quay
- Land parcels in LPC ownership beyond the site such as the 'non-operational land' identified on the PLP that adjoins Department of Conservation and Christchurch City Council land above Summer Road and the Coal yard.
- Gollans Bay Quarry area.
- A native coastal planting strip along the eastern face of the reclamation area.

Natural rock riprap and a native planting strip along the eastern face of the reclamation area would assist in the short to medium term to visually integrate and soften the proposal in association with the Outer Harbour coastal natural character. This would not screen or mitigate the visual impact of the reclamation and container terminal in the context of the natural character of the outer harbour however it would provide a softening of the visual impact from close proximity on the water of the harbour. Overtime the ecological restoration of the Port bluffs and back slopes would further integrate the landscape and ecological values with the Outer Harbour natural landscape.

The proposed reclamation area has been designed to accommodate the berthing of ships and loading and unloading operations. This has resulted in a rectilinear form which is typical of Ports. This form is not natural in appearance and contrasts with the immediate natural rugged coastal headlands and bays. At a broader scale, the reclamation area appears consistent in scale with the harbour-wide indentations and headlands despite its more geometric form. It is understood that the form of the reclamation has been determined by operational considerations such as efficiency, capacity and wave conditions.

The proposed reclamation is an extension of the past reclamation in Te Awaparahi Bay and Cashin Quay where the coal storage area and container terminal are currently located. These reclamation areas end at Battery Point which is a small natural headland. The proposed reclamation would further extend from this headland into the Harbour diminishing its form but not removing its legibility as a headland.

From the headland eastward the coastal edge of the harbour along Gollans Bay is not proposed to be modified except for quarry excavations above. Gollans Bay provides a transitional area or visual buffer along this coastal harbour edge between the modifications of the Port infrastructure at Te Awaparahi Bay – existing and proposed, and the identified outstanding natural landscape of the Outer Harbour to the east.

It is noted that while NZCPS recognises the preservation of 'coastal natural character', it also *recognises that a sustainable national transport system requires an efficient national network of safe ports, servicing national and international shipping while seeking to avoid cumulative effects of development on the natural character of the coastal environment.* (Policy 9 - Ports). Under the CER Act, the Recovery Plan extension of the existing Port in an area of existing coastal modification, consolidates the Port to already predominantly modified parts of the harbour landscape. This location largely preserves the high natural character areas of the Outer Harbour, and avoids cumulative impact of the proposed reclamation on coastal natural character while also providing for the social, economic, cultural and environmental well-being of surrounding communities and greater Christchurch as required under the Act.

5.2 Assessment of Effects on Natural Features and Landscapes

Natural landscape values are an important consideration for assessing the landscape impacts of the Recovery Plan on the social and environmental well-being of communities. This is also identified in the Resource Management Act and the NZCPS. In the NZCPS (Policy 15 Natural Features and Natural Landscapes (c), P18), the following criteria are provided as a basis for assessing natural landscapes (including seascapes) which is also useful in the context of informing an assessment under the CER Act:

- (i) *natural science factors, including geological, topographical, ecological and dynamic components;*
- (ii) *the presence of water including in seas, lakes, rivers and streams;*
- (iii) *legibility or expressiveness—how obviously the feature or landscape demonstrates its formative processes;*
- (iv) *aesthetic values including memorability and naturalness;*
- (v) *vegetation (native and exotic);*
- (vi) *transient values, including presence of wildlife or other values at certain times of the day or year;*
- (vii) *whether the values are shared and recognised;*
- (viii) *cultural and spiritual values for tangata whenua, identified by working, as far as practicable, in accordance with tikanga Māori; including their expression as cultural landscapes and features;*
- (ix) *historical and heritage associations; and*
- (x) *wild or scenic values;*

At a regional scale, the entire Banks Peninsula landscape including the harbours has been identified as an outstanding regional landscape (under the RMA) in a study prepared by Boffa Miskell in 2010.

This landscape (Banks Peninsula) is considered outstanding due to its exceptional legibility, very high aesthetic and shared and recognised, tangata whenua and historic values, high natural science and moderate to high transient values. It is acknowledged that qualities vary across an area of this size.

The Regional Landscape Study primarily guides local authorities through Regional Policy Statement (under the RMA) for the preparation of local District Plan landscape studies and provisions. The Site is located in a well-defined visual and spatial catchment within Banks Peninsula which has been assessed at a local scale as part of the Bank Peninsula Landscape Study.

In 2007, the Banks Peninsula Landscape Study (BPLS) was prepared by Boffa Miskell Ltd. The outcomes of this assessment have been included in the Christchurch City Plan. Parts of the Lyttelton Harbour Basin were identified as 'Outstanding Natural Features and Landscapes' (ONFL) using very similar (but not the same) criteria adopted in the NZCPS. The identified ONFLs in the Banks Peninsula section of the Christchurch District Plan broadly include: sections of the upper ridges and slopes of the Port Hills, Mt Herbert lava flow above Diamond

Harbour, some prominent ridgelines, Quail Island and Adderley Head. Urban settlement areas were excluded from the scope of the BPLS. Refer to **Figure 4 - Context Plan**.

Based on this, the Site is not located in an identified ONFL. The eastern end of the Site above Gollans Bay adjoins an identified ONFL. The broad landscape context of the site includes visually apparent ONFLs. These landscapes are not physically affected by the proposal however people's visual experiences of the broader landscape could be affected to differing degrees from different locations. In the context of the broad harbour landscape, the Port extensions are likely to be visually absorbed by the scale of the landscape from distant and medium range views. At some closer proximities, the extensions of the existing Port would become a dominant element of the landscape. Essentially, the closer a viewer is to the proposed extensions of port infrastructure and operations, the more likelihood their experience and appreciation of the broader landscape is affected. This is currently the case with the existing visual effects of the Port infrastructure although to a lesser degree.

It is noted that as part of the 'values-based' assessment approach of the BPLS, a 'significant landform' was identified above the coal storage area within the Site. This is a geological expression of a volcanic lava flow. This rock formation is located above the Sumner Road away from any proposed quarry or haul road earthworks and outside of the Recovery Plan boundary.

The Recovery Plan proposal would not directly affect any identified outstanding natural landscape or features. The visibility of industrial structures such as cranes, ships and the proposed large area of reclamation and stacked containers would however have an adverse effect on the aesthetic natural landscape values of the broader outer harbour.

5.3 Assessment of Effects on Rural Amenity Landscapes

The term "amenity" is used in the Minister's Direction to prepare the Recovery Plan;

*5.1.2 The social, economic, cultural and environmental well-being of surrounding communities and greater Christchurch, and any potential effects with regard to health, safety, noise, **amenity**, traffic, the coastal marine area, economic sustainability of Lyttelton town centre and the resilience and well-being of people and communities including the facilitation of a focused, timely and expedited recovery;*

For the purposes of this assessment under the CER Act, the following definition of the 'amenity', provided in the RMA, has been adopted.

Amenity values are those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.

This definition covers aesthetic and physical aspects of providing for the well-being of communities associated with Lyttelton Township and Harbour as well as visitors to the area.

Due to the large extent of the Site, rural and urban qualities and characteristics are part of the amenity context of the Site. The Site adjoins and includes (Gollans Bay quarry area) an identified Rural (Visual) Amenity Landscape (RAL) in the BPLS and the Banks Peninsula section of the City Plan. These are landscape areas identified as visually attractive and valued for recreation use. The RAL covers all rural land on Banks Peninsula that is not otherwise identified as an Outstanding Natural Landscape or Coastal High Natural Character Area. The study identifies that over the broad Peninsula *the landscape is a mosaic of landcovers which in combination result in a landscape of high visual amenity within which it is extremely difficult to*

sensibly distinguish particular areas. In the case of the RAL adjoining the Site and applying to the rural and quarry portions of the site, it is certainly a mosaic of past and present land uses. These include a forestry block, quarrying, roads, modified grassland, scrubland patches and gullies with native vegetation, mixed tree planting, and highly legible natural rock outcrops and bluffs.

The visual character of this RAL is not coherent overall, however it provides an attractive landscape backdrop for the town and Port, and harbour users. It also provides foreground views from the Crater Rim Walkway and Sumner Road in the event that that route is reopened. The RAL is closely associated with the town and port and is broadly part of the continuous landscape area around the harbour landscape. It is arguably less attractive as a landscape area than other RAL areas around the harbour due to its mixed landcover character and modifications to natural topography.

The proposed development of the Container Terminal area under the Recovery Plan would increase the appearance of port infrastructure adjacent to a section of the adjoining RAL, however it does not physically alter the RAL. The proposed spatial and visible increase in Port infrastructure would have an adverse impact on some peoples' appreciation of the harbour as an attractive recreational landscape, particularly within the immediate vicinity of the proposed Port extensions on the water. The increased appearance of industrial structures interrupting views of the natural harbour landscape and the reduction of seascape area is aesthetically incoherent with the aesthetic natural landscape and seascape values of the harbour and its surrounding landscape.

Having recognised the aesthetic incoherence of industrial character in a natural landscape setting, the existing landscape context with cranes and Port infrastructure is also an established part of the harbour landscape context. The visual presence of the Port on the amenity values of the harbour landscape has overtime become part of people's historical understandings and legibility of Lyttelton Harbour and Township as a Port-based landscape. This pre-conception and knowledge makes the visual presence of the Port in this attractive and natural harbour landscape not unexpected to many people. The proposals envisaged by the Recovery Plan are consistent with these expectations accepting that there is a need for repair, reconfiguration and enhancement projects at the Port to recover from the effects of the earthquakes and enable the operations of the Port to grow as demand increases overtime.

5.4 Assessment of Effects on Urban Landscape Amenity

Industrial landscape character is part of the history and identity of Lyttelton and can be considered an aspect of people's aesthetic appreciation of the town. This has been acknowledged through the PLP consultation feedback. The historic character of many buildings and structures (as well as associated social history) are important aspects of the town's identity. As part of earthquake recovery the town is likely to change in character to some degree with new buildings and public spaces being created. It is important that the character of these is considered in the context of the town's overall aesthetic coherence, and historical and cultural associations. The communities of Lyttelton are well-recognised for their artistic, cultural and community-based activities, and their pride in the identity and character of the town. Appropriately building onto this appreciated townscape character, through the Recovery Plan, would support the ongoing well-being of the community.

Under the Recovery Plan, the proposed relocation of some Port operations out of the Inner Harbour creates significant opportunities for the staged enhancement of Dampier Bay, Inner Harbour and Naval Point, as more publicly accessible areas with an improved standard of urban amenity. This is anticipated to include greater community access to the waterfront with an emphasis on activities that have wide appeal. Possible uses of this area include; retail, hospitality, office/studio, marina extension, a new ferry terminal and improved public access and connectivity between Lyttelton, recreational areas and the Inner Harbour.

These areas are currently predominantly inaccessible to public use and the Inner Harbour is currently being used by the LPC with some limitations due to earthquake damage. The Inner Harbour areas have a strong industrial appearance that is currently spatially disconnected from the Town by fencing, railway lines and a level change. This low-amenity situation is likely to significantly improve overtime with the implementation of the PLP and the Recovery Plan.

Landscape opportunities that would assist with enhancing the landscape amenity and community wellbeing of the Port as part the Recovery Plan could include:

- Highlighting through design and interpretation and/or protecting where practicable historically significant structures and areas.
- Acknowledging culturally significant areas/sites and connections to the broader landscape, and acknowledging these through appropriate design with Te Hapū o Ngāti Wheke.
- Providing direct, legible and safe linkages from Dampier Bay to the town centre and public transport connections.
- Design guidance for new buildings to maintain and enhance the historic and industrial landscape and townscape character of the Port and Town including considerations of building activation, location, height, area, material, form and colour as well as signage, car parking and lighting guidance.
- Inclusion of greenspace areas with play and recreation elements within Dampier Bay, Naval Point and the Inner Port.
- Inclusion of amenity planting in a way that is consistent with maintaining the industrial landscape character of the Site
- Providing for environmentally sensitive stormwater design and management as part of development proposals.
- Preparation of an extended Landscape/Ecological Restoration and Rehabilitation Plan for the vegetated natural bluffs through the entire site including amenity planting along Norwich Quay.
- Reusing and recycling of industrial materials such as wharf timbers and paving units in proposed landscape treatments within the Port.
- Inclusion of local communities in developing design and public art proposals.
- Integrating vehicle, pedestrian and cycleway linkages with the town layout and circulation, and broader recreation and transportation routes.
- Providing opportunities for people to access the water's edge including for recreational boating.
- Management of the appearance and location of utility and service areas.
- Consideration public safety provisions including CPTED (Crime Prevention through Environmental Design) and IPTED (Injury Prevention through Environmental Design).
- Protection of public view shafts from the Town to the Port and harbour landscape.

- Inclusion of public amenities such as toilets, bus shelters, seats, way-finding, etc

These opportunities could be explored and co-ordinated through the preparation of a Concept Plan for Dampier Bay, which could guide the development of individually staged parts as a co-ordinated whole. This would also assist with co-ordination with the Lyttelton Town Centre Master Plan and any streetscape development of Norwich Quay. Such a Concept Plan could be used by LPC to guide development in Dampier Bay.

The Christchurch City Council (CCC) has prepared a post-earthquake 'Lyttelton Master Plan', dated June 2012 for the town centre. This proposes a series of initiatives to support the rebuild of the Lyttelton town centre. A key initiative is to "enable alternative Port access investigations and public access to the inner harbour waterfront." The intended outcomes of the Port Lyttelton Plan and the CCC Lyttelton Master Plan appear to be supportive of one another subject to further investigations into how to practically achieve some of the intended outcomes. Both Plans would significantly improve the urban amenity of the town and waterfront particularly if effective co-ordination of development and planning initiatives is achieved through Council and LPC working together on outcomes.

Currently under the City Plan rules, buildings up to 15 metres in height are permitted within the Port Zone. Quayside and container cranes have no height limit and fuel tanks at Naval Point can be up to 23 metres in height. It is anticipated that these height rules in the City Plan will remain as part of the Recovery Plan. A potential adverse effect on the amenity of the town is views of the harbour and the broader landscape being screened by new buildings in some locations. Areas identified as being potentially at risk of this include; views from Norwich Quay and the residential section of Godley Quay in Dampier Bay. These potential impacts (in these locations) could be managed by: lower height rule for an identified area of Dampier Bay, and provision for ensuring view shafts between buildings are maintained along Norwich Quay.

Similarly, the proposed cruise ship berth Option A alongside Naval Point tank farm in the 'Middle Harbour' would screen a small portion of the view of the harbour landscape from some locations within Lyttelton township. Option B at Gladstone Quay would have less visual screening. Given the temporary presence of the cruise ships this potential adverse effect is likely to be minimal. Some members of the viewing population may consider the presence of cruise ships in the Port to be interesting and not adverse to the landscape amenity values of the town.

5.5 Cultural and Historical Landscape

Lyttelton Township, Port and Harbour have a long and recognised history of human occupation and settlement. *Whakaraupo* – Lyttelton Harbour is recognised as having a rich history of Ngāi Tahu land use and occupancy. Rapaki Marae is located within the harbour as are historical sites such as 'Ohinehau Village' and a 'Maori Market' (Source: Lyttelton Town Centre Masterplan, 2012) along the Lyttelton waterfront within the Site. These locations are interconnected with traditional waka and trade routes in the harbour landscape.

Lyttelton Township is registered by the Heritage New Zealand (HNZ) as a 'Historic Area' for being an example of a planned colonial settlement dating from 1849. The 'Lyttelton Township

Historic Area' had significant aesthetic and architectural qualities particularly prior to the 2010/2011 earthquake sequence. This is now only partly remaining in places however the town still retains its historical, social and archaeological significance.

The Port area is not included as part of Historic Area as it is a working site with infrastructure developments anticipated, however it is recognised as an integral part of the built, economic and social history of the Historic Area. Today, this is reflected in sites around the Port such as Pilgrim's Rock, Battery Point Gun Emplacements, Magazine Bay Torpedo Corps site and museum, and other areas. Other sites and historic elements such as stone walls, railway tunnel, brick barrel drain outlets, wharves, some Port and railway buildings and structures, and occasional artefacts including historic boats. As part of a Concept Plan, historically and culturally significant areas/sites and connections to the broader landscape should be highlighted and protected, and incorporated into future design proposals in publicly accessible areas such as Dampier Bay. This would add to people's appreciation of the historical and cultural attributes of the Site and town.

Within the Recovery Plan, the 'Battery Point Battery Historic Area' is registered by HNZ and recognised as "*Canterbury's only example of Victorian defence structures remaining alongside those from World Wars I and II and it provides a significant demonstration of the defence measures taken during these three differing times with typical features from each*" (HNZ website). Battery Point slopes steeply down to the water's edge at the eastern end of the Site with approximately 20 items including gun emplacements, searchlight emplacements, a battery observation point, engine room, and magazine and war shelter identified. This area extends in an irregular form up the Sumner Road following the old Sumner Road alignment. As part of the Recovery Plan, it is proposed that a quarry haul road cross through this area. The alignment of the haul route is proposed to largely follow an existing haul road and traverse an existing quarried face behind the coal storage area. This new road is proposed to be wider than the existing with some potential to disturb a small part of the Historic Area. The Battery Point area of the Historic are where most historic structures are located are not proposed to be affected. As part of the Landscape/Ecological Restoration and Rehabilitation Plan for the coastal bluffs along the natural coastline of the Site, a section could be incorporated for historic heritage management of the 'Battery Point Battery Historic Area' and any other sites of historic significance.

5.6 Lighting

Currently the Lyttelton Port marine services operate 24 hours a day, seven days a week. It is anticipated that this will continue in the future, including in the proposals envisaged through the Recovery Plan. This means that the proposed Container Terminal will require night-lighting which would create additional visual effects. These are likely to include; horizontal and vertical light spill and glow, direct visibility of light sources, visibility of movement at the port, and illumination of Port structures and activities at night. For the Port to operate effectively and safely, a minimum of lighting is required. The required lighting standards and levels of illumination are outlined by others as part of the Recovery Plan.

Currently, the City Plan requires that no operation or activity (within the Lyttelton Port Zone) shall be conducted so that direct illumination exceeds 10 lux (lumens per square metre) within the boundary of any site within the Residential Zone, Residential Conservation Zone or Town

Centre Zone. Activities complying with this illumination level are permitted. This rule is unlikely to change as part of the Recovery Plan although the height of lighting structures may need to increase depending on final lighting design.

The visual effects of new lighting are likely to be most visible from Diamond Harbour and Purau as well as to some extent from Governors Bay, and to a lesser degree residents on the west side of Lyttelton Township. These residents will be able to see additional Port lighting beyond the existing General Cargo area. From Diamond Harbour the lighting is likely to appear as an extension to the existing Port to the east. It will be approximately 200 metres nearer to the closest viewers in Diamond Harbour (albeit that residents will remain some 1.8km from the Container Terminal area) and is likely to be have a denser lit appearance due to the increased width of the Port.

From Purau, part of the Container Terminal area lighting is likely to be visible. Currently the General Cargo area is not visible however lights in the coal storage area are visible. The lighting of the Container Terminal is likely to be more than the current level of lighting visible. The viewing distance is approximately 3.3km from the Purau to the closest edge of the proposed Terminal. The appearance of increased lights over this distance is not likely to adversely affect residences significantly at night except in that some people's perception of isolation and tranquillity may be adversely affected.

It is anticipated that the District Plan rules for illumination would address the potential adverse visual effects of proposed new lighting (refer to lighting technical report). From a night time landscape perspective, outlooks from parts of Diamond Harbour and Purau would change to that of increased Port lighting being visible, along with visibility of Port activity at night. This impact is not likely to change the character of the outlook significantly due to the current extent of Port lighting and night activity visible from Diamond Harbour. From locations such as Purau where Port night-lighting is currently less, the increase is likely to be more apparent in night time views. This view is however over a distance of approximately 3 kilometres making the actual extent and impact on the Bay residents minimal while slightly changing the visual character of the night time experience.

5.7 Viewpoint Analysis

Within the visual catchment of the Lyttelton Harbour basin, the Site is visible from various parts of the Harbour. These viewing distances range significantly and vary in orientation and aspect. The following are areas with potential visibility to the Port:

1. The potential viewing areas include both transient and resident populations of Lyttelton Township, Governors Bay, Purau, Diamond Harbour and the Charteris Bay headland.
2. Recreational and commercial marine traffic, including sight-seeing tours on the harbour. Recreational boating is a popular activity on the harbour. The extent of low-elevation views of the Site from the water vary as boats move around.
3. Summit Road and recreational users of the Port Hills, such as runners, walkers, and mountain bikers. The elevated amphitheatre-like form of the slopes on the harbour's edge provide some views out to the heads, across the harbour and up to the surrounding hills. From key locations on the Summit Road, broader encompassing views of the Site and Lyttelton Harbour are possible.

To assess the anticipated visual effects of the Recovery Plan, a series of panoramic

photographs have been taken from areas surrounding the Site. Visualisations of the proposal from some viewpoints have also been prepared. A technical explanation of the method used in the preparation of the visualisations is provide as **Figure 8 – Visualisation Methodology**. These viewpoint locations are identified in **Figure 5 - Viewpoint Location Plan** and discussed in the following section.

Livingstone Bay/Summit Road - Photographic Viewpoint 1

Photographic viewpoint 1 illustrates a view from above Livingstone Bay on the Crater Rim Walkway approximately 2.6 kilometres from the edge of the proposed reclamation area (Container Terminal). Between Evans Pass and Godley Head on the walkway, views towards the Site are intermittent from the southwest facing sections and spur ridges. This is particularly the case above Livingstone Bay when walking towards the Site. The reclamation and Container terminal will appear as an extension to the visibly apparent existing Port. This will increase the visual presence of the Port infrastructure from this viewpoint in the context of the middle and upper harbour landscape. From beyond this point (to the east), the site becomes increasingly difficult to see except where the viewer is on promontory viewpoint locations. As the viewer moves eastward the viewing distance diminishes the visual presence and impact of any views to the Site.

It is noted that when experiencing the harbour landscape from the walkway, the site is peripheral in the viewing context of the harbour and broader Banks Peninsula landforms which dominate the experience. It is apparent (when visible) to the very west side of the panoramic views.

From the Summit Road is essentially not visible except from the pullover area above Livingstone Bay (as visible in Photographic viewpoint 1). The site is only just visible from the Walkway if a viewer leaves a vehicle and moves to the walkway at the location.

Evans Pass - Photographic Viewpoint 2 and Visualisation 2

This viewpoint looks southwest towards the Site and across the harbour to Purau and Diamond Harbour from Evans Pass. From this popular viewing location, the current view is impressive and predominantly composed of natural landforms and the seascape of the harbour. Under the proposal, the impressiveness of the landscape would be retained however it would have the added element of the Port visible to the immediate west side of the view.

From computer visual-modelling of the proposal in this view – refer to **Visualisation 2**, an area of proposed reclamation and port operations would be visible when looking westward. An area of ship berths, cranes, stacked and moving containers, and rip rap edge treatment would be visible to the right of the broader view of the harbour landscape. The visual impact of this visibility of the Site is likely to be minimal in the scale of the broader view however it would introduce an active industrial node into a view. This is likely to be perceived by some viewers as an adverse effect given the current predominance of a broad natural landscape view. Other viewers may consider the visibility of the Port as a new man-made landscape element of visual interest. Ships are frequently seen from this location arriving and departing from the Port.

Prior to Sumner Road being closed due to earthquake rock fall, viewers' awareness of the Port operations become apparent when travelling on Sumner Road towards Lyttelton above Battery Point approximately 1 kilometre west of Evans Pass. The extension of the Port towards Evans Pass will bring the Port into view from the Pass earlier than was previously experienced from

Sumner Road and is likely to be visible for the length of Sumner road from Evans Pass to Lyttelton particularly when travelling in the outer west bound lane. The height of cranes is likely to create a visual awareness of the Port below this section of road.

The immediate landscape surrounding the Evans Pass viewpoint has been considerably modified by the past Gollans Bay Quarry activities below and earthworks associated with road construction. In the future, further earthworks are likely to increase as part of recommencing quarrying. To some extent these earthworks activities would have short to medium term effects associated with earthquake recovery projects. Once completed, it is recommended that active and natural regeneration of native plants endemic to the Port Hills is managed as part of a Landscape/Ecological Restoration and Rehabilitation Plan. This is currently required as part of the Quarry consent approval. In time, this would reduce the visual impact of land disturbance around the vicinity of this public viewpoint.

Gondola Building - Photographic Viewpoint 3

From the Gondola building, extensive 360 degree panoramic views of Banks Peninsula, Christchurch City, Pegasus Bay, and the Southern Alps are visible. Looking down and southwards from the Gondola building towards Lyttelton Township, the Site is partially visible. Spurs and landforms obscure eastern and western parts of the Site. The General Cargo and Container Terminal (reclamation area) areas are largely obscured by the eastern spur landform. The degree of screening varies slightly as a viewer moves around the vicinity of the viewpoint however the proposed new Container Terminal is very likely to remain largely screened with the possibility of the tops of ships or cranes emerging from behind the landform.

From this viewpoint, the proposed elements of the Recovery Plan would not appear as a significant change to the existing Port scale and landscape character and quality. The broad panoramic views experienced by tourists and visitors from the Gondola building would not be adversely affected by the proposal. Additional Port activities would be seen as part of the existing Port-related infrastructure.

Crater Rim Walkway - Photographic Viewpoints 4, 5 and 6

Photographic Viewpoints 4, 5 and 6 were taken from locations on the Crater Rim Walkway. The Walkway extends from 'Sign of the Bellbird' to approximately Mt Cavendish where it continues along the ridge as the Mt Pleasant Bluffs Track. The Site is visible to varying degrees along this track due to intervening landforms.

Photographic viewpoint 4 illustrates that the site is openly visible from the top of the Bridle Path where it intersects with the Crater Rim Walkway. This viewpoint looks directly downwards to the Port, 1.5 kilometres from the closest boundary of the Site. From this viewpoint, most of the Inner Port and existing Outer Port are visible. The proposed Container Terminal area would be predominantly obscured from this viewpoint however parts of cranes and ships are likely to be visible. This would indicate the wider visual extent of the Port from this viewpoint. When Cruise Ships are berthed adjacent to the 'Tank Farm' along the Outer Port, the visual extent of the Port along the Lyttelton waterfront would be further extended. This visual increase in the number of ships visible is consistent with the existing visual extent of port infrastructure in these areas from this viewpoint.

Within the Inner Port, wharves 4-6 are proposed to be removed making way for the potential to extend the recreation marina from Dampier Bay filling most of the Inner Port with visually finer-grain/scale of boats and wharf infrastructure. This would change the visual character of the Inner Port near the Lyttelton Town Centre to a more active recreation character more consistent with the visual 'grain' of the residential dwellings on the hill slopes. This visual change would have a positive landscape amenity effect on the character of the town and the Port.

The increased size of the Port activities and structures could potentially be perceived by some people as adverse to the landscape quality of this view. The Port is also a key focal point of interest in this view that is integral to the historical heritage of the Bridle Path. The view of the Port from this location tells the story of early European settlers arriving in Lyttelton and travelling over the Port Hills to Christchurch. From this viewpoint both destinations are visible and clearly represent this historic journey.

Photographic Viewpoint 5

This photographic viewpoint was taken near Mt Vernon on the Crater Rim Walkway approximately 3 kilometres from the Site, and shows that intervening spurs interrupt views to the Site. The photograph also illustrates that a small glimpse of the proposed Container Terminal would be visible. The viewing experience from the Crater Rim Walkway of the harbour would include sections of no or minimal views of the Port due to landform screening, and different viewing orientations along the walkway. The long viewing distances, scale of surrounding landscape views, and the intervening landforms and vegetation would make any adverse visual effects from this part of the Crater Rim Walkway negligible.

Photographic Viewpoint 6

From the start of the Crater Rim Walkway at the 'Sign of the Bellbird' a view of the entire harbour is possible. This is a very impressive broad scale landscape view that illustrates the Upper and Outer Harbour sections and the radial spurs descending into the harbour bay edges. The Port is visible approximately 7 kilometres along the south side of the Middle Harbour area. From this distance, the proposed new Container Terminal would be visible extending into the Harbour by approximately 215 metres over an existing harbour width at this point of approximately 1600 metres. This would be approximately a 13% decrease in the existing width of the Harbour between Stoddart Point and existing Cashin Quay. Ships would further reduce this distance by approximately 40 metres when berthed alongside the new Container Terminal.

Over the viewing distance of this viewpoint, this extension into the Harbour would not significantly affect the quality of the view. The industrial character Port within the Harbour landscape would become slightly more apparent and the visual separation between the Inner and Outer Harbour areas would become more accentuated. The impressiveness of natural landforms and seascape in this view would be maintained.

Lyttelton Township - Photographic Viewpoints 7 and 8, and Visualisation 7

The township of Lyttelton is contained by two main east and west spur landforms extending from the crater rim. These landforms visually frame many views from public and residential viewpoints within the town. These outlooks are also strongly experienced as vistas along the radial road pattern that extends away from the Inner Port.



View looking down Canterbury Street towards the Inner Port.

From these framed viewpoints, the anticipated visual effects of the Recovery Plan are:

- An increase in small-scale recreation boats in the Inner Port consistent with the residential character and scale of the town.
- Increased vehicle and parking activity.
- Increased visitor and pedestrian activity in the town centre and along the waterfront.
- New structures built as part of the marina and waterfront development.
- Increase amenity landscape treatment of parts of the waterfront.
- Increased visibility in larger ships such as Cruise ships berthed along the Outer Port or possibly Gladstone Quay in the Inner Port.
- Visibility of the extended Container Terminal from some western viewpoints.

Photographic Viewpoint 7 was taken from Cressy Terrace looking eastward towards the Site. This viewpoint shows the existing Inner Harbour area, the Naval Point area and the Cargo and Container Terminal areas. From this part of Lyttelton Township the extended Container Terminal is likely to be visible from some locations. The proposed structures visible are likely to be;

- stacked containers (approximate maximum height of 9 metres – 2-3 containers high),
- cranes (approximately 115m tall in upright position),
- new buildings,
- straddles – vehicles carrying and moving containers around,
- lighting poles and fixtures (approximately 40m high), and
- movement of trucks, cranes, straddles and ships.

To assist with assessing the visual impact of these elements from the west of the township, **Visualisation 7** has been produced. This shows that the above elements would be visible from **Viewpoint 7** through and beyond the existing area of the proposed 'General Cargo - Area 4'. The visual impact of these elements from this western residential part of Lyttelton is likely to be

minimal given the existing mid ground character of Port infrastructure, and the approximate 2km distance from this viewpoint to the new structures and activities. A potential adverse effect of the reclaimed land for the new Container Terminal is a slight reduction in perceived seascape towards the Outer Harbour from the viewpoint. In the broader panorama of the harbour, this reduction is minimal and the legibility of the harbour extending to the sea is still apparent.

The intermittent berthing of cruise ships adjacent to the Tank Farm/Naval Point Area would introduce large structures into views from Lyttelton Township including from **Viewpoint 6**. These cruise ships would be a maximum size of approximately 350 metres long and up to approximately 50 metres high and would obscure some parts of the harbour landscape from the town. This would be temporary and the appearance of the ships is not uncharacteristic of the existing character of Lyttelton as a 'Port town'. It is acknowledged that cruise ships have a character and presence that is of visual interest to some people and have in the past attracted sightseers to the Port.

Within the Inner Harbour foreground of this view; the existing Wharf No.7, dry dock and buildings, Tank Farm and oil berth, and sports fields would remain. Wharfs 4-6 would be removed and replaced in time with an extended recreation marina. The existing Dampier Bay Marina would be extended with provision for a passenger Ferry Terminal beside Wharf 7. In conjunction with these changes, improved public access and use of the waterfront is proposed with a pedestrian promenade, commercial activities, and the addition of amenity and ecological plantings in Dampier Bay. These changes would improve the visual and landscape amenity outlook from **Viewpoint 6** by creating a less industrial appearance and visually connecting the town with the Port through a visually finer-grain scale of development as well as softening with new plantings within the Inner Port area.

Photographic Viewpoint 8

Photographic viewpoint 8 was taken from Reserve Terrace on the crest of the spur descending to the Port. This photograph represents a typical view looking eastward to the proposed area of reclamation and Container Terminal. In this view, a smaller rocky landform and large pine trees partially interrupt views. The Container Terminal would be visible from this location. Approximately 2-3 private houses and gardens on the spur may have similar views towards the Terminal to the east. These elevated properties may enjoy views of the Outer Harbour and the Heads but are likely to have their outdoor living areas facing in the opposite direction towards the northwest sun and away from the prevailing easterly winds. The views from these locations are likely to include existing port infrastructure which under the proposal would be extended eastward. Distant Outer Harbour views are likely to be retained from these elevated properties.

Governors Bay

Photographic Viewpoint 9 was taken from approximately 7 kilometres from the closest boundary of the Site and shows the existing appearance of Lyttelton Port from Governors Bay when looking eastward towards the entrance to Lyttelton Harbour. This viewpoint was taken from a public road in Governors Bay. Roads in Governors Bay are typically lined with vegetation and houses obscuring views to the Port. Many houses are likely to have more open and expansive views of the Harbour landscape. The viewpoint shows that the Port is currently visible and that the proposed new Container Terminal will extend the Port into the Harbour to the extent of the end of the Cashin Quay breakwater visible on the photograph. Ships would be berthed alongside this area.

Visualisation 9 shows the visual effect of the Container Terminal extension from this distant viewpoint. The new Container Terminal would increase the visual presence of the Port within the view of the harbour entrance. The verticality of the cranes would interrupt the ocean horizon line and open water between the Heads. This interruption would be seen over a distance of approximately 7 kilometres making the visual scale small within the broader landscape of the entire Harbour. Nonetheless, this view is a focal point from parts of Governors Bay which would have an increase visual presence of the Port cranes and ships.

Diamond Harbour

Photographic Viewpoint 10 was taken from Diamond Harbour in front of an empty section at 43 Koromiko Crescent looking northward towards the Site. This viewpoint location is approximately 1.7 kilometres from the closest built development area (outer wharf edge) of the Site, and was selected as representative of an unobstructed residential view towards the Site from Diamond Harbour. Some residential properties are likely to have clear views towards Lyttelton Port from other parts of Diamond Harbour as well.

From this specific viewpoint, the water of the harbour, the Lyttelton Township, the Port, and the southern slopes of the Port Hills are three strong visual elements. The silhouetted ridgeline of the Port Hills is a very strong visual element in this view. The Port and township are active focal points of the view with a predominantly industrial character. Changes to this view based on the Recovery Plan include; the occasional presence of the cruise ships in front of the Naval Point/Tank Farm area, or the removal of the 'Eastern Mole' at the entrance to the Inner Port with cruise ships berthed at Gladstone Pier, and the reclamation in Te Awaparahi Bay and the construction of the new Container Terminal including ships, cranes, stacked containers and port activities.

The visual effects associated with cruise ships being occasionally located in front of the Naval Point area would include; screening of the existing fuel and oil tanks, an increase of apparent built bulk and scale of ships, and an extension of the ship berthing along the Middle Harbour port edge. In the context of existing industrial character, ships at the nearby Oil Berth, and the temporary presence of cruise ships, the visual presence of a cruise ship in this location is not likely to significantly impact on the visual amenity of this part of the view from Diamond Harbour, and may improve the amenity by screening the existing industrial character and adding a point of interest for some people. Cruise ships berthed at Gladstone Pier would minimally affect the existing visual amenity from Diamond Harbour due to this location being currently used as a ship berth. The larger scale of some cruise ships would mean that their bows would extend into the outer port channel to a small extent. This would have very minimal visual adverse effect in the existing character context of this part of the Port.

From this viewpoint, the proposed new Container Terminal would be visible as an extension of the existing container area which is currently located at Cashin Quay. This would extend the visibility of cranes, stacked containers (maximum of 3 high – approximately 9m) to the east. The Container Terminal would protrude into the harbour by approximately 215 metres with berthed ships adding another approximate 30-50 metres into the harbour. The width of the harbour at this location is currently approximately 1600 metres which would be reduced to approximately 1340 metres with ships berthed. This would bring the visibility of port activities closer to the Diamond Harbour residential areas however the closest area to the Port on the Diamond Harbour side is Stoddart Point which is a Recreation Reserve. Closest residential areas are approximately 1700-1800 metres from the proposed Container Terminal.

In order to assess the likely visual impact of the Recovery Plan from Diamond Harbour, a visualisation has been prepared from **Photographic Viewpoint 10 – refer to Viewpoint Visualisation 10**. This shows that visual extent of the Container Terminal is set with a landscape backdrop of Gollans Bay Quarry. This backdrop is predominantly in shadow creating a dark tonal colour. The most visually apparent features of the Terminal are the cranes set against the dark landscape. To reduce the visual impact of the cranes a carefully selected colour scheme with low reflectance and reflectivity values and be similar to the colour hues of the shaded landscape backdrop, would assist. This could include tones of browns, greys, greens and/or purples. This visual mitigation would assist with reducing the visual impact of the Container Terminal.

The Container Terminal would still be a significant new element in the view that would effectively extend the industrial character of the Port to the east creating a visually larger Port area. This will change the view to a more modified and developed appearance consistent with the existing Port. There will be a loss of natural appearance to the east along the harbour edge however the Port Hills landscape will still be a very dominant feature of this view.

This visualisation also shows the proposed benching of the Gollans Bay Quarry behind the cranes. The Quarry is part of the Recovery Plan site but has been consented under a previous 10 hectare reclamation consent. For the purposes of understanding the visual effects of the Container Terminal in the consented context, a visualisation of both has been included in **Viewpoint Visualisation 10**.

Photographic Viewpoint 11 was taken at on Waipapa Street at the upper edge of the Diamond Harbour residential area. This view is typical of many views from streets and houses in Diamond Harbour where views to the Port are partial and often interrupted by houses, trees and other elements. From many residences the proposed extensions to the port would have minimal effect on the quality of the outlook due to viewing distances, the existing maritime industrial character of the Port, and possible screening of foreground elements. The existing large trees in Stoddart Point Reserve interrupt many views of the proposed new Container Terminal from the eastern part of Diamond Harbour.

As part undertaken this assessment Stoddart Point was visited. It was apparent that views to the Site were predominantly screened by vegetation except for fragmentary views along the coastal edge. Through trees and foliage, the Site can be seen across the harbour. These views are predominantly filtered by vegetation.



View from Stoddart Point on an informal track along the harbour edge

From the Diamond Harbour ferry terminal the Site is visible from the wharf. This viewpoint along with the route to Lyttelton is used by residents and visitors to the area. The proposed Container Terminal would be visible from this part of the harbour surface to the east as an extension of the existing port. It would partly obstruct and change the views to the east of the natural landscape of the Outer Harbour and is likely to reduce the landscape and seascape amenity experience for many people.

Purau

Photographic Viewpoint 12 was taken from a location in Camp Bay Road in Purau Bay looking north towards the Site. From this location the site would be partly visible between Stoddart Point and Ripapa Island headland at the entrance to the Bay. Through this view shaft, the existing coal storage area with lighting poles, conveyor gantries, some small buildings, Battery Point with historic gun emplacements, and mid-ground moored boats in the Bay are discernible. Passing ships and other moving harbour boats could be seen in this view. The existing area of reclamation is partly visible with benched rear hill slopes of past quarrying and roads traversing the slope. These elements combine to create a highly modified landscape in part of this view. The remaining part of this view is a portion of Otokitoki/Gollans Bay which is beyond the boundaries of the Site and appears less modified by human activity and more natural in character. This area is predominantly pasture and scrubland covered with horizontal banding of exposed modified and natural rock formations. Land disturbance from earthquakes is apparent in this area.

Under the Recovery Plan proposal, this view would partially change. The eastern end of the Container Terminal would be visible up to approximately Battery Point. Stacked containers, lights, crane(s) and straddles, and a ship(s) would be visible. These would be approximately 3.3 kilometres from this viewpoint which is representative of views from dwellings along the beachfront of the Bay. Over this distance the proposed new visible elements would not appear large in the context of the Bay however they would be visually framed by the entrance to the bay and directly in the northern outlook of some dwellings. This would create a new focal point from the Bay of an area of more active port. While this could be perceived by some residents and recreation users as adverse to the relaxed character of the Bay, the visual separation of activities would make the impact of this visual effect not significant however it would change the character of the Bay to a small extent.

Photographic Viewpoints 13 and 14 were taken from the Camp Bay Road looking towards the site and the Outer Harbour area. These viewpoints are approximately 2.3 and 2.8 kilometres from the closest proposed edge of the Site. They illustrate that the site is confined to an area of existing modification through reclamation, quarrying and coal storage up to Battery Point. Beyond this point, roads, quarrying and landfill activities have modified the coastal bluffs diminishing the natural visual character of Gollans Bay. From Livingstone Bay eastward, the steep rocky coastal bluffs on the north side of the harbour retain a high natural character despite the historical removal of most established indigenous vegetation. The Recovery Plan proposals do not extend into the coastal area east of Gollans Bay. Quarrying is proposed above Gollans Bay at the eastern end of the Site. From this viewpoint the existing Lyttelton Port is visible as would the proposed new Container Terminal. In this outer part of the Harbour, the natural landscape and seascape would predominate over the visual presence and character of the proposal.

In the vicinity of Pile Bay there are approximately 4 rural (lifestyle) dwellings and some small bach dwellings in the bay (visible in photo 13). The bach dwellings face into Pile Bay and do not look directly towards the Site. The rural dwellings appear to face towards the site with a mix of plantings around the buildings. The outlook from these dwellings is likely to change to that with increased port infrastructure and activity. The existing port is approximately 2.9 kilometres from these dwellings and the proposed extension would move the Port approximately 2.3 kilometres towards the dwellings. These distances provide a degree of visual buffering however the port would be approximately 600 metres closer to dwellings with an increase in visibility. This shift and increase in the area of the Port, in the context of broad harbour views and the

presence of the existing Port, is not likely to significantly impact on the quality of the outlook from these dwellings.

From visiting the southern side of the Harbour, it was noted that views to the Site are affected by frequent transient atmospheric characteristics. Factors that contribute to this are; shading on the southern side of the Port Hills, hilltop clouds and coastal mist, and periods of smog. These factors are likely to be more present in the winter months, and affect the clarity of visibility to the Site from around Lyttelton Harbour.

Lyttelton Harbour

Photographic Viewpoint 15 was taken looking west on the water surface of Lyttelton Harbour approximately 900 metres away from the proposed reclamation area. This view broadly shows the existing expanse of harbour seascape, crater rim skyline, and the indented bays of the harbour edge including the headland of Stoddart Point and Otamahua/Quail Island. The extent of existing Port reclamation and infrastructures are also visible.

The Recovery Plan would further extend the low-lying reclamation area and Port structures towards the viewer from this aspect on the harbour. It would also extend these elements towards Stoddart Point decreasing a portion of the harbour water area and appearing to narrow the harbour width at this point. To assist with understanding the extent and impact of this, **Viewpoint Visualisation 15** has been prepared.

As previously described, Lyttelton Harbour can be conceived of having three parts – Outer, Middle and Upper Harbours. The Middle Harbour is located between Stoddart Point and Battery Point and the broader residential settlement areas of Diamond Harbour and Lyttelton. The visual effect of this extension of the Port into the harbour would be to accentuate the distinction between the Upper and Outer Harbour areas by narrowing the Middle Harbour. The harbour as a whole would remain spatially and visually connected however the landscape character and spatial distinction between the Upper and Outer Harbour areas would be more apparent. This is illustrated in **Viewpoint Visualisation 15**.

From the Outer Harbour looking towards the Port and the Upper Harbour there would be moderate to small reduction of visible harbour seascape in the context of the overall harbour. The low angle of view from the surface of the water reduces the visibility of the reclamation area. The visibility of vertical structures such as tall cranes, large ships and stacked containers would increase as these are extended towards the viewer and into the harbour channel area. These elements are not out of character in the existing harbour landscape however an increase in their visual prominence will occur from this viewpoint.

The existing reclamation area of Port is clearly legible as a flat landscape element distinguishable from the natural coastal edges. It appears to “float” at the water away from the coastal bluffs. The modified nature of the Port in contrast to the bluffs makes it appear as an artificial element within the landscape of the harbour basin. The legibility of this visual distinction could be enhanced by accentuating the visual contrast between these elements. At a broad scale, landscape/ecological and natural character restoration of the coastal bluffs behind the proposed Container Terminal and General Cargo areas, and in Gollans Bay would accentuate this contrast.

At close proximity, native coastal planting along the eastern edge of the reclamation area to partially screen containers would improve the amenity of this edge for recreation users on the

harbour, as well as provide some degree of integration of the edge with the coastal natural character of the Outer Harbour.

Gollans Bay Quarry

A component of the Recovery Plan is quarrying at Gollans Bay Quarry as a source of bulk fill for the Te Awaparhi Bay reclamation and to maintain a supply of maintenance hardfill materials. A resource consent application for this quarrying activity was approved in 2010 under Order in Council. Under the Recovery Plan, the proposal has not changed except for modifications to the access haul road immediately above the existing coal storage area and for the more widespread use of the quarry material. This is proposed to be further widened as shown in **Figure 6 – Gollans Bay Quarry Haul Road**.

The current consent conditions requires a Landscape and Ecology Rehabilitation/Enhancement Plan (LEREP) to be prepared for the Quarry area. A description of the detail required for the LEREP is contained in the attached **Appendix 1: Gollans Bay Quarry Consent Decision**.

In the context of the Recovery Plan, **Visualisation 9** includes the consented Quarry benching with some vegetation cover. This illustrates the likely landscape outcome of the combined elements in the Plan from Diamond Harbour. This is shown below in more close-up detail.



The LEREP conditions highlight the importance of the ecological and natural restoration and enhancement of the coastal bluffs. This could be undertaken as part of a broader Landscape/Ecological Management Plan covering the historic coastal bluffs and edges through the Site. This would enhance the ecological function, landscape amenity values, and natural character of the Site as well as integrating it into the broader landscape.

6.0 Recommended Mitigation and Enhancement

Based on outcomes of the above landscape and visual assessment, the following are recommended mitigation and enhancement proposals to be incorporated into the Recovery Plan.

Recommended Mitigation - Refer to Figure 6 – Mitigation and Enhancement Plan in graphic supplement

1. Develop integrated Landscape/Ecological Restoration and Rehabilitation Plan for the natural coastal bluff areas behind the proposed reclamation, Cashin Quay and Quarry Area within the Site including:
 - Preparation of an ecological rehabilitation strategy for short and long term rehabilitation measures.
 - Identification of potential covenanted areas and their ecological management.
 - Exclusion of grazing stock.
 - Identify planting areas that would enhance the appearance of the amenity lookout areas that is currently dominated by road barriers, a security fence and rubbish discarded down the embankment.
 - Historic heritage and archaeological sites such as Battery Point.
2. Native coastal tree planting and under-planting, and natural local stone rip rap along the eastern end of the reclamation area of the proposed new Container Terminal to provide landscape and seascape visual mitigation as well as potential for ecological faunal habitat. This strip should be approximately 6 metres in width. Planting species are likely to be exposed to strong coastal winds at times and will require careful management during establishment periods. Species could include:
 - Myoporum laetum* - ngaio (proposed predominant species)
 - Phormium tenax* - harakeke/ flax (proposed predominant species)
 - Dodonaea viscosa* – akeake (proposed predominant species)
 - Cordyline australis* – tī kōuka /cabbage tree
 - Olearia paniculata* – akiraho/ golden akeake
 - Coprosma robusta* – karamū
 - Pittosporum tenuifolium* – kōhūhū

It is noted that this would go some way to meeting recommendation 3(c) in the Cultural Impact Assessment.
3. Preparation of a colour scheme for the Container Terminal cranes with a reflectivity value of less than 30%, and a colour palette of greens, and/or greys, and/or browns, and/or purple/blues. These should be recessive and harmonious with the landscape backdrop.

4. Quarry Haul Road

- It is recommended that a proposed construction methodology is developed to avoid side casting material down the slopes below the road to reduce the visual effects.
 - The establishment of vegetation on the cuts should be encouraged. This could be achieved by way of hydro-seeding/hydro-mulching or planting. Vegetation would assist to stabilise the slopes as well as reduce the visual impact of the cuts.
5. Lighting - To mitigate potential adverse perceptions of night-lighting of the Container Terminal, careful design and selection of fittings and technology to reduce the visual impact of direct light sources by shielding and directing the light downwards away from viewers.
6. Assessment Matters – building heights and locations in Dampier Bay area and along Norwich Quay.

Recommended Enhancements

The following recommendations are proposed in response to the CER Act and the potential visual and landscape effects of the Recovery Plan.

7. Preparation of a guiding Concept Plan (based on an ODP) for publically accessible areas in the Inner Harbour areas of primarily Dampier Bay, and later the Inner Port and parts of Naval Point including integrating with CCC land. This should include:
- Highlighting through design and interpretation and/or protecting where practicable historically significant structures and areas.
 - Acknowledging culturally significant areas/sites and connections to the broader landscape, and acknowledging these through appropriate design in collaboration with Te Hapū o Ngāti Wheke.
 - Guiding the design of new buildings and landscape treatments to ensure they are in-keeping with the character of the Lyttelton townscape and the Port.
 - Providing direct, legible and safe linkages from Dampier Bay to the town centre and public transport connections.
 - Inclusion of greenspace areas with play and recreation elements within Dampier Bay, Naval Point and the Inner Port (where practicable).
 - Inclusion of amenity planting in a way that is consistent with maintaining the industrial character of the Site.
 - Providing for environmentally sensitive stormwater design and management as part of development proposals (where practicable).
 - Extending the Landscape/Ecological Restoration and Rehabilitation Plan for the vegetated natural bluffs through the entire Recovery Plan site.
 - Reusing and recycling of industrial materials such as wharf timbers and paving units in proposed landscape features or treatments within the Port.
 - Inclusion of local communities in developing design and public art proposals.

- Integrating vehicle, pedestrian and cycleway linkages with the town layout and circulation, and broader recreation and transportation routes.
- Providing opportunities for people to access the water's edge including for recreational boating.
- Management of the appearance and location of utility and service areas.
- Consideration public safety provisions including CPTED (Crime Prevention through Environmental Design) and IPTED (Injury Prevention through Environmental Design).
- Protection of public view shafts from the Town to the Port and harbour landscape.
- Inclusion of public amenities such as toilets, bus shelters, seats, way-finding, etc.

7.0 Summary and Conclusions

In summary, the following are findings from this assessment of visual and landscape effects of the Recovery Plan:

1. Lyttelton Harbour is an attractive, coherent and well-defined volcanic landscape with areas of high natural character.
2. Lyttelton Township historically reflects the early Maori and European heritage giving it a unique character with a strong sense of community.
3. The town and the harbour landscape also accommodate one of the South Island's major commercial deep water ports which is serviced by many international shipping lines and is an important component of the local and regional economy.
4. Since the 2010/2011 earthquakes, both the Port and the town have been severely damaged requiring repairs and careful reconsideration of their future redevelopment options.
5. The Lyttelton Port Recovery Plan proposes a staged repair, reconfiguration and enhancement of the Port area to provide for greater public access to the Inner Harbour and the relocation of the Container Terminal to a new 10 ha reclamation and a proposed additional 27 hectares of reclamation in Te Awaparihi Bay at the eastern end of the existing Port that will be in effect for the next 30 years.
6. This Recovery Plan is directed by the Canterbury Earthquake Recovery Act 2011, New Zealand Gazette, Notice 65 (19 June 2014) subject to *an assessment of the proposal against the Canterbury Earthquake Recovery Act 2011, relevant considerations of the Resource Management Act 1991, the New Zealand Coastal Policy Statement 2010, the Mahaanui Iwi Management Plan and other relevant statutory and non-statutory plans*; such as Christchurch City Plan (and Banks Peninsula District Plan) and Lyttelton Township Masterplan.

7. In summary, this landscape and visual effects assessment of the Recovery Plan finds that:

- The Recovery Plan proposal avoids directly adversely affecting any previously identified outstanding natural landscapes or areas of outstanding coastal natural character, and is located within an existing highly modified site.
- The Site adjoins an area of outstanding natural landscape and an area that is likely to be considered high coastal natural character in the Outer Harbour which the proposed reclamation and Container Terminal will have adverse visual effects on.
- Landscape and ecological planting and restoration proposals are recommended in this assessment to assist with the visual mitigation and integration of the Site and the adjacent natural landscapes.
- The proposed staged developments in Dampier Bay including improved linkages to the town centre are likely to significantly improve the urban amenity of the Port and town subject to further design development and the implementation of recommendations in this assessment.
- Of the two options for the cruise ship berths, Option B at Gladstone Quay is likely to have the less visual impact on the outlook from Lyttelton Township and Diamond Harbour however due to the temporary presence of the Cruise ships at Option A, the ships would not significantly affect the quality of outlook from these broad locations.
- Visibility from the Crater Rim Walkway (including the Gondola building) would not be significantly adversely affected by the Recovery Plan proposal due to the viewing distances, the existing Port character and visual screening of landforms.
- The proposed Container Terminal is likely to be highly visible from sections of Sumner Road between Evans Pass and Lyttelton Township as an extension of the existing Port which will increase the prominence of Port infrastructure on views to the broader landscape.
- Visual effects of the Recovery Plan proposal are likely to be very positive from many locations in Lyttelton Township with a finer grain of maritime activity. From western parts of the town, a portion of the extended Container Terminal would be visible through existing Port infrastructure. In the context of the existing Port, this visibility would not have significant adverse visual impact on views to the Outer Harbour.
- From Governors Bay many houses look east towards the Heads and the Site. The proposed cranes would be visually apparent in this view breaking the open sea horizon line between the headland land forms adversely impacting on the quality of the view. These focal point views are seen over 7kms away in the context of the existing Port and the broad panorama of the harbour landscape minimising the impact of this effect.
- From many residences in Diamond Harbour, the extended Container Terminal would be visually apparent as an extension of the existing Port to the east. This will reduce a portion of visible more natural landscape from some properties

and adversely affect some residents' outlook. From many parts of Diamond Harbour views towards the Port are obstructed by houses, garden plantings and large trees in the Stoddart Point Reserve.

- From the beach at Purau Bay the extended Container Terminal would be partially visible approximately 3.3 kilometres away between the headlands of the Bay. While this could be perceived by some people as adverse to the relaxed character of the Bay, the visual separation of activities would make the impact of this effect not significant.
- From the outer harbour looking towards the Port there would be a reduction of visible harbour seascape in the context of the overall harbour. The visibility of vertical structures would increase as these are extended eastward and into the harbour channel area. This would adversely impact on the existing predominance of natural landscape and seascape amenity in parts of this area. These proposed elements are not out of character with the existing harbour landscape however an increase in their visual prominence will occur adversely affecting peoples' appreciation of the harbour amenity.
- The visual effect of the extension of the Port into the harbour would be to accentuate the visual and spatial distinction between the Inner and Outer Harbours and to narrow the middle harbour area. This would not necessarily adversely affect the usability and landscape amenity of the Harbour landscape (except as discussed previously), however it would reduce the coherence of the harbour seascape as a whole.

In conclusion, the anticipated visual and landscape effects of the proposed Lyttelton Port Recovery Plan are likely to be very positive for the Lyttelton Township, while having some adverse visual effects on the natural character and landscape of the Outer Harbour area. The Recovery Plan proposal avoids areas of identified outstanding natural character and natural landscapes. The proposed landscape rehabilitation and restoration recommendations in this assessment would assist with softening and integrating the Recovery Plan into the natural landscape and seascape setting around Gollans and Te Awaparahi Bays.

Lyttelton Harbour is a well-defined landscape unit that is appreciated for scenic, lifestyle, cultural and historical, ecological and economic values. The Port of Lyttelton is an important part of the harbour landscape contributing to the history, character and economics of the area and beyond. The proposed expansion of the Container Terminal (and associated reclamation) is likely to have the greatest visual and landscape impact on the harbour. In the context of the existing Port infrastructure, the separation distances from most residential areas, the recommended mitigation, and the significant positive benefits to the well-being and amenity of many local (and regional) people, the implementation of the Recovery Plan would, on balance, have acceptable potential effects and outcomes on the landscape values of the harbour.

Appendix 1: The Recovery Proposal

Introduction

The purpose of the Lyttelton Port Recovery Plan is to address the recovery of the port. This includes the repair, rebuild and reconfiguration needs of the port, and its restoration and enhancement, to ensure the safe, efficient and effective operation of Lyttelton Port and supporting transport networks.

By nature the recovery will be highly complex, involving a multitude of individual yet interrelated projects many of which will need to be carefully coordinated with each other as well as the operation activities at the Port. The ultimate outcome of this repair, rebuilding and reconfiguration work is the moving east of port operations in a timely manner, which results in:

- The container terminal being established up to 37ha of reclaimed land in Te Awaparahi Bay;
- The shifting of some types of general cargo from the Inner Harbour to Cashin Quay; and
- The development of public access to the Inner Harbour in two stages (Dampier Bay and potentially the Dampier Bay Extension) to provide a commercial marina and associated activities, with public access and connectivity between Lyttelton and other parts of Naval Point.

At this stage it is assumed that the direct repairs or rebuild of existing wharf structures, seawalls and hard-standing areas and the construction of the reclamation would take in order of fifteen years, being completed in about 2028. However, the complete migration of the Port's operation to the east could well take up to 30 years.

Some of the repaired or rebuilt berths at Cashin Quay, Naval Point and the new berths at Te Awaparahi Bay will be designed to handle larger vessels with a deeper draft. The deepening and widening of the current navigation channel to enable access of these larger vessels is therefore inextricably linked to and forms an important part of the Port's Recovery.

The Figures contained in Chapter 2 of the Lyttelton Port Recovery Plan provide an outline of proposed Recovery. The Recovery description below is discussed under four headings:

- Reclamation, Container Terminal and Quarry;
- Cashin Quay;
- Inner Harbour;
- Cruise Berth Options.

It must be emphasised that the descriptions below is based on our current understanding of the economic and commercial drivers which shape the Ports infrastructure needs. It is possible that the infrastructure needs of our customer and the freight mix could change over the next 15 years,

in response to worldwide economic factors and industry changes. More detailed descriptions, including the project codes, of each individual projects are included in Chapter 2.

Reclamation, Container Terminal and Quarry

The additional reclamation will be developed using a range of different methodologies, which will be influenced by the type and quantity of available fill. It will initially move in a southern direction to enable the construction of a new berth line, which facilitates the development of the first stage of a terminal in behind this. It is anticipated that this part will comprise approximately 8 hectares directly south of the currently consented 10 hectare area and would be constructed from quarry sourced hardfill (Gollans Bay quarry and/or Sumner Road reopening works), end tipped in a similar way to the current 10 hectares.

Land creation would then focus on moving in an easterly direction, and it is likely that a combination of hard and marine fill will be utilized. This area could be as much as 19 hectares, and may require the construction of a containment bund if marine fill is to be utilised. Aggregate would need to be imported to form the foundation of the pavement layers. This then enables the extension to the east of the adjacent new berth line, and subsequent development of a container terminal in behind this.

This staged methodology will provide for the creation of critical additional container terminal capacity at the earliest opportunity.

Container Terminal

The new terminal will include a container-handling yard connected to two modern berths designed to handle larger vessels. These are typically 6000 TEU¹ vessels that are approximately 300m long and have a draught of up to 14.5m. The berths will be constructed in two stages and at full completion up to eight cranes could be used to serve two vessels. The container terminal would be designed to utilize straddle carries to move containers.

Quarry

The existing quarry will provide rock for the proposed reclamation in Te Awaparahi Bay, not only for fill material but also for large rocks needed to 'armour' the reclaimed land from the sea. The rock will also be needed to armour the rebuilt seawalls elsewhere in the Port e.g. in the Inner Harbour. The rate of take and the extent of the quarry will be no more than what is currently consented for the 10 hectare reclamation.

Previous investigation work suggested bench widths of up to 7.5m at the quarry although double-benching may be used in parts of the quarry. Double-benching involves approximately 10m wide benches, stepped out every 30m vertical. The existing haul road connecting the quarry to Te Awaparahi Bay will need to be widened, and in places realigned to ensure gradient is suitable for haul trucks.

¹ The twenty-foot equivalent unit i.e. 6000 twenty foot containers

Cashin Quay

Cashin Quay berth No.2 is currently subject to a major rebuild. This includes the removal and reconstruction of the wharf, seawall and associated hard standing areas. The other three berths at Cashin Quay will also require significant repair or replacement.

Cashin Quay will continue to handle containers in the medium term, however, after the container handling facilities are established in Te Awaparahi Bay, Cashin Quay's focus will change to one of general, bulk and break bulk cargos such as logs, fertiliser, and scrap metal. Coal will continue to use Cashin Quay berth No.1.

New buildings will be developed to support the expanding port including maintenance and administration facilities.

Inner Harbour

Eastern Port Operations

The eastern part of the Inner Harbour (from Wharf No.3 eastwards) will continue to be part of the Port operational area. However, the cargo handling operations will shift towards those which are less noisy and dusty (these will be moved to Cashin Quay). Cement ships, some break bulk cargo, car vessels and the larger fishing vessels are likely to use this area as would the tugs and other support vessels used by LPC.

Number 2 and 3 wharves will need to be replaced or substantially repaired as will the No.1 breastwork.

Dampier Bay

The development of Dampier Bay with a mixed use commercial development and marina is anticipated to commence early on in the Recovery. This will allow for community access to the waterfront with an emphasis on activities that have wide appeal.

Dampier Bay will result in improved public access and connectivity between Lyttelton Township and the western Inner Harbour. The proposed waterfront promenade will also facilitate better connectivity between Lyttelton Township and the recreational areas at Naval Point.

The first phase of the Dampier Bay development involves the construction of a modern floating pontoon marina catering for up to 200 berths. Phase 1 will also include developing the landside adjacent to the marina, this will include car parking, marina facilities, walkways and some commercial development. This is expected to be completed in 2016/2017.

The remainder of the Dampier Bay development is expected to take a further 4-7 years. This will include:

- Development of the landside with a mixed used commercial development (up to a total of 15,000m² of floor space), possible uses include; marine related industries and services, retail, hospitality, office/studio
- Retiring the use of Sutton Quay for heavy vehicle port access and shifting the security fence to the eastern side of No.7 Wharf.
- Extension of the walkway along the waterfront and linking this with pedestrian access to Norwich Quay (via or adjacent to Sutton Quay)

- Creation of a new Diamond Harbour ferry terminal which will link with public transport and walkways to the township. The most likely location for the terminal is at the base of No.7 wharf
- Creation of some open space areas

The design of the buildings, promenade and other public spaces will be undertaken in a way which respects both the character of the Port and Lyttelton Township.

Damper Bay may continue to serve the inshore fishing fleet although the exact location for them has yet to be decided.

Dampier Bay Extension

The Dampier Bay Extension project comprises the LPC owned land between No.7 wharf and the western side of No 3 wharf. It also includes the block of LPC owned land to the south of Norwich Quay and provision of public access to No.7 wharf. It does not include the railway lines and siding which are owned by Kiwirail.

The ability to develop this area is dependent on the migration of the port to the east and can only happen once a new container terminal is operating in Te Awaparahi Bay and majority number of trades have moved to Cashin Quay. Consequently timing for starting works in this area is approximately 15-25 years

As this project is a not to commence for some time, planning has yet to commence on what could be done in this area. However the following are potential options:

- The demolition of Wharf's No. 4, 5 and 6 creates the potential for an extension to the recreational marina area to the east of Number 7 Wharf, enabling the construction of further marina berths.
- Continuation of the Dampier bay waterfront walkway
- Limited on land development to provide support services for the marina and walkway
- Potential for some type of commercial development

In the meantime Port land is at a premium and this area will continue to be used for cargo handling and other port-related operations.

Naval Point (Port owned land)

The bulk fuel berth is to remain at its existing location at Naval Point although this facility will be rebuilt, and will be constructed in a way that can be extended to accommodate larger vessels in future if required. The Dry Dock will continue to operate in the same location, as will those activities that rely on the dock. It is possible the old Cattle Jetty, located between the Oil Berth and the Dry Dock, could be replaced with a new wharf.

Options for Cruise Ships

Inner Harbour and Outer Harbour development options for Cruise ships are being investigated. These include an option to locate the berth facilities on the harbor side of the Naval Point Tank Farm or alternatively to locate the berth at Gladstone Quay in the Inner Harbour. The new berth will be of a size to handle large cruise ships which are up to 350m in length and have draught of approximately 8.5m.

Both options would require dredging to establish the berth pocket and the Z-berth mole would need to be removed for the Inner Harbour option.

Port wide repairs and reconstruction

In addition to the specific assets that need repairing or replacement (i.e. wharfs) there is also port wide infrastructure that needs repairing or rebuilding. This is principally the pavements, roads and underground services.

This work will be programmed around the need to continue operations at the port and will occur throughout the recovery program.

Pavements and roadways

Much of the ports pavement have suffered significant earthquake damage. Many of the roads and sealed surfaces in the port will either need to be replaced or have significant repairs. This will involve removal of the existing pavement, re-compacting the underlying material (including re-levelling) and then re-surfacing.

Services

Like other parts of the City, the ports services, i.e. stormwater, wastewater, power and data have been damaged and need repair or replacement. Some parts will also need upgrading to provide for the reconfiguration of the Port. Services work will also focus on providing resilient internal networks for the Ports 24/7 operations.

This work will involve the excavation and repair of the underground services including provision of relocated and discharge points into the harbor if needed. Some above ground structures, such as substations, pump stations etc, will also need to be repaired and in some cases relocated.

Appendix 2: Gollans Bay Quarry Consent Decision

To achieve the purpose of the SMP, it shall include but not be limited to the following:

- a) An overview of the proposed quarry excavation methods;
 - b) Details on the proposed staging of quarrying;
 - c) A geotechnical report in the slope stability for each stage area of quarrying; and
 - d) Stabilisation techniques used (including final bench design consistent with a geotechnical assessment) and where practicable the application of aggregate, geotextile, mulch, hydroseeding or other methods to establish vegetation on overburden.
5. The SMPs may be amended at any time. Any amendments shall achieve the purpose of the SMP and shall be submitted in writing for the acceptance by the Resource Consents Manager, Christchurch City Council.
6. A copy of the SMPs required by Conditions (3) and (4) or amended in accordance with Condition (5) shall be kept on site at all times.

Landscape and Ecology Rehabilitation/Enhancement Plan

7. The Consent Holder shall provide to the the Resource Consents Manager, Christchurch City Council, a Landscape and Ecology Rehabilitation/Enhancement Plan (LEREP). The LEREP shall be prepared in consultation with the Christchurch City Council and its purpose shall be to set out the proposed rehabilitation and enhancement works for the quarry and haul road upgrade. To achieve the purpose of the LEREP it shall include but not be limited to the provision of information on the following:
- a) **Planting of haul road batter slopes**
 - i. Identification of the staging of the haul road upgrade works, and the batter slopes, including any benching of batter slopes, that will become available for planting.
 - ii. A planting plan for the batter slope plantings that includes:
 - The location, spacing and identification of indigenous species suited to the batter slope conditions.
 - A typical cross section showing the species type and the conditions of the batter slope or bench.
 - A description of maintenance methods including weed and pest control, replacement planting and protection of plantings from grazing animals where relevant and practicable.
 - b) **Planting of quarry benches**
 - i. Identification of the estimated staging of the quarry extraction works, including the construction of any batter slopes above the quarry benches.
 - ii. A planting plan for areas of the quarry that become available, including:
 - The location, spacing and identification of indigenous species suited to the batter slope conditions.
 - A typical cross section showing the species type and the conditions of the batter slope above the quarry benches.
 - A description of maintenance methods including weed and pest control, replacement planting and protection of plantings from grazing animals where relevant and practicable.
 - c) **Gully Enhancement Plantings**
 - i. Identification of the four gullies that are to be subject to enhancement plantings. Three gullies are located in Te Awaparahi Bay above the Old Sumner Road and below Sumner Road and the fourth gully which drains the quarry stormwater in Gollans Bay.
 - ii. A planting plan for the gully plantings that includes:
 - The location, spacing and identification of indigenous species suited to the batter slope conditions.
 - A typical cross section that shows the species type and the conditions of a gully.
 - A description of maintenance methods including weed and pest control, replacement planting and protection of plantings from grazing animals where relevant and practicable.
 - A timetable identifying when planting is to commence for each gully.
 - d) **General Weed Control**

- i. A weed control strategy that applies to the site in general, but in particular to those areas that contain indigenous vegetation that have been identified to be of particular value will form part of the LEREP.
 - ii. The weed control strategy shall include the species of invasive weeds that require control as well as the frequency of control and associated monitoring.
8. The LEREP may be submitted to the Council in stages, provided that:
- i. those matters outlined in Condition 7(a) shall be provided prior to the commencement of the haul road upgrade and realignment.
 - ii. those matters outlined in Condition 7(b) shall be provided prior to the commencement of the extraction of quarry material.
 - iii. those matters outlined in Condition 7(c) and (d) shall be provided within six months of the date on which this consent is first exercised.
9. The LEREP may be amended at any time. Any amendments shall achieve the purpose of the LEREP and shall be submitted in writing for the acceptance by the Resource Consents Manager, Christchurch City Council.
10. A copy of the LEREP and any subsequent amendments shall be forwarded to Te Hapū o Ngāti Wheke (Rapaki) and to Te Rūnanga o Koukourārata (Port Levy).

Construction Noise Limits

11. All construction work associated with the upgrading of the haul road shall comply with the following limits at any affected residential dwelling, when measured and assessed in accordance with NZS 6803:1999 Acoustics – Construction noise.

| <i>Time of week</i> | <i>Time period (hours)</i> | | |
|------------------------------------|----------------------------|------------|-------------|
| | | <i>Leq</i> | <i>Lmax</i> |
| Weekdays | 0630-0730 | 55 | 75 |
| | 0730-1800 | 70 | 85 |
| | 1800-2000 | 65 | 80 |
| | 2000-0630 | 45 | 75 |
| Saturdays | 0630-0730 | 45 | 75 |
| | 0730-1800 | 70 | 85 |
| | 1800-2000 | 45 | 75 |
| | 2000-0630 | 45 | 75 |
| Sundays and public holidays | 0630-0730 | 45 | 75 |
| | 0730-1800 | 55 | 85 |
| | 1800-2000 | 45 | 75 |
| | 2000-0630 | 45 | 75 |

Construction Noise Management Plan (CNMP)

12. Prior to any construction work commencing, the Consent Holder shall submit a Construction Noise Management Plan (CNMP) to the Resource Consents Manager, Christchurch City Council. The purpose of the CNMP is to set out the measures to ensure compliance with the construction noise limits in Condition 11 of this consent. The CNMP shall be prepared by a suitably qualified and experienced acoustics expert in consultation with the Christchurch City Council and shall include but not be limited to:
- a) A description of the activities which generate construction noise.

Appendix 3: Graphic Supplement



Port Lyttelton Recovery Plan Landscape Report

Boffa Miskell



Appendix 3 - Graphic Attachment

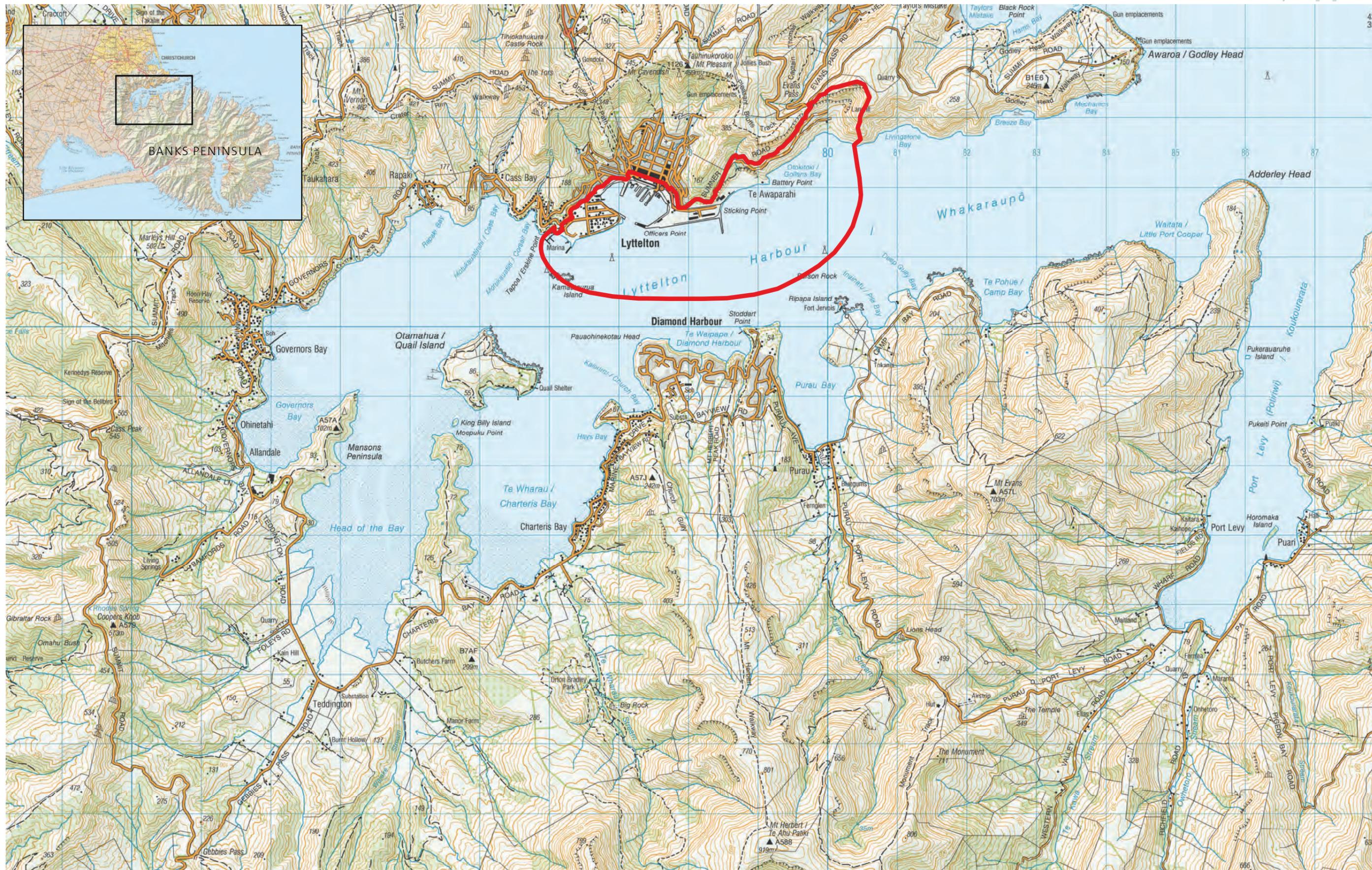
PREPARED FOR LYTTTELTON PORT COMPANY
BY BOFFA MISKELL LIMITED | 10 November 2014

Port Lyttelton Recovery Plan

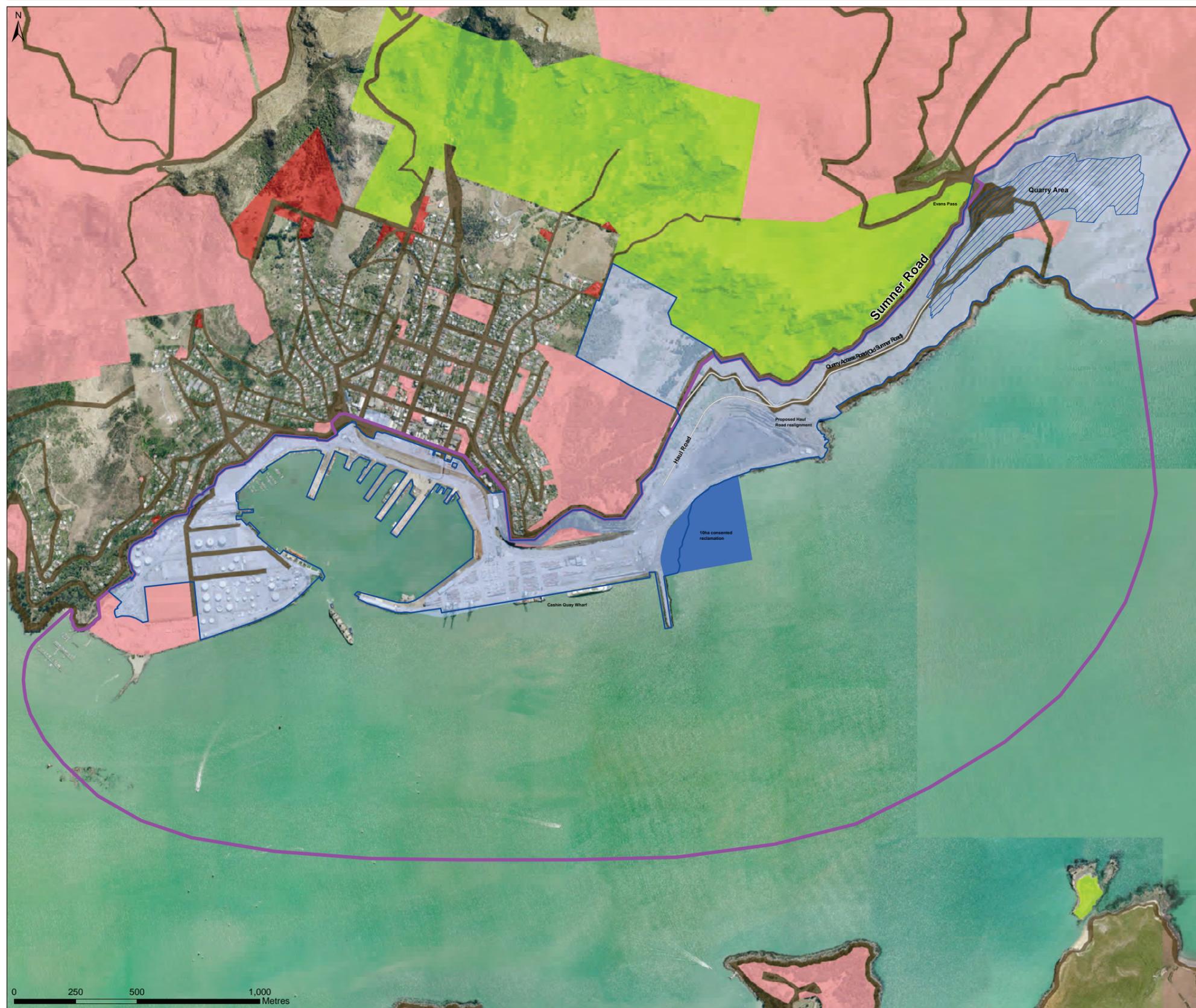
Landscape Report

Appendix 3 - Graphic Attachment- Landscape Report

| | |
|--|----|
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Geographic Extent of Lyttelton Port Recovery Plan



- Legend**
- Lyttelton Port - Boundary Information**
- Indicative Geographic Extent of Recovery Plan
 - Note** - Boundary falls downslope of Sumner Road and includes Norwich Quay)
 - LPC - Site Boundary
 - CERA - Residential Red Zone as of 04/12/2013
- Lyttelton Port Company - Existing Infrastructure**
- Existing Quarry
 - 10 ha Consented Reclamation
 - Existing Port Roads
- Categorised Land Ownership**
- Lyttelton Port Company
 - DOC - Public Conservation Areas
 - Local Government
 - LINZ Primary Road Parcels

Map Purpose:
The purpose of this map is to illustrate the geographic scope of the Lyttelton Port Recovery Plan, in accordance with the Ministers Direction.

Publication Date:
11/06/2014

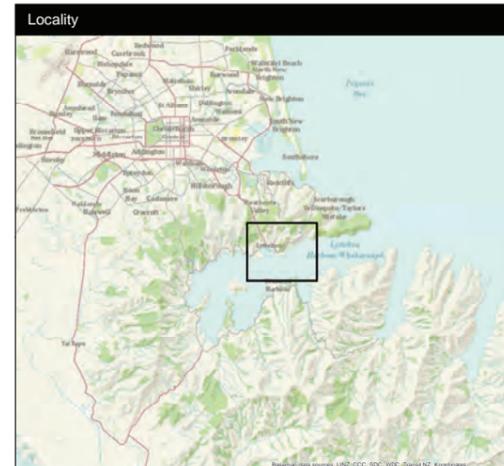
Scale:
1:5,250
(Original sheet size A0)

Disclaimer
This map is a static output of depicted layers and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Coordinate System:
NZGD 2000 New Zealand Transverse Mercator

Map Document:
6374 - LPC Future Planning Map A0.mxd

For re-prints and map production contact NorthSouth GIS:
ServiceDesk@nsgnz.co.nz



OUR LONG TERM VISION

1 Dampier Bay

Development of Dampier Bay will create an engaging and vibrant waterfront with public access and connectivity between Lyttelton, the Inner Harbour and the recreational areas at Naval Point.



2 (PORT) Inner Harbour

The Inner Harbour is an important part of the port's operations and will remain so in the future. However the Port Lyttelton Plan will allow us to move some operational activities out of the Inner Harbour.



5 Container terminal

Our long-term plan for a modern container terminal at Te Awaparahi Bay is key to the Port Lyttelton Plan as this enables the port to move Inner Harbour general cargo onto Cashin Quay. The new terminal will require approximately 30ha of reclaimed land at Te Awaparahi Bay.



Recreation links

We are already working to identify opportunities for safe recreational links. For example, we are keen to see our land between the Urumau and Buckleys Bay Reserves be used for tramping and mountain bike trails.



LYTTELTON HARBOUR
WHAKARAUPŌ

Key

| Project type | |
|--|-------------------------------|
| ■ | Thriving Port |
| ■ | Connecting with the community |
| Land type | |
| | Land to be reclaimed |
| | Non-operational Port land |
| | Recreational land |
| | Potential public access |

3 Naval Point

The bulk fuel berth is a critical part of the energy infrastructure of Canterbury. A number of options are being considered, including Inner and Outer Harbour options. We are also considering options for new wharves between the existing bulk fuel berth and the Dry Dock.



4 General cargo

The movement east of the container terminal will allow some general cargo operations to move onto the current container terminal. This will mean the storage and loading of general cargo will predominantly occur on Cashin Quay.



Cruise ships

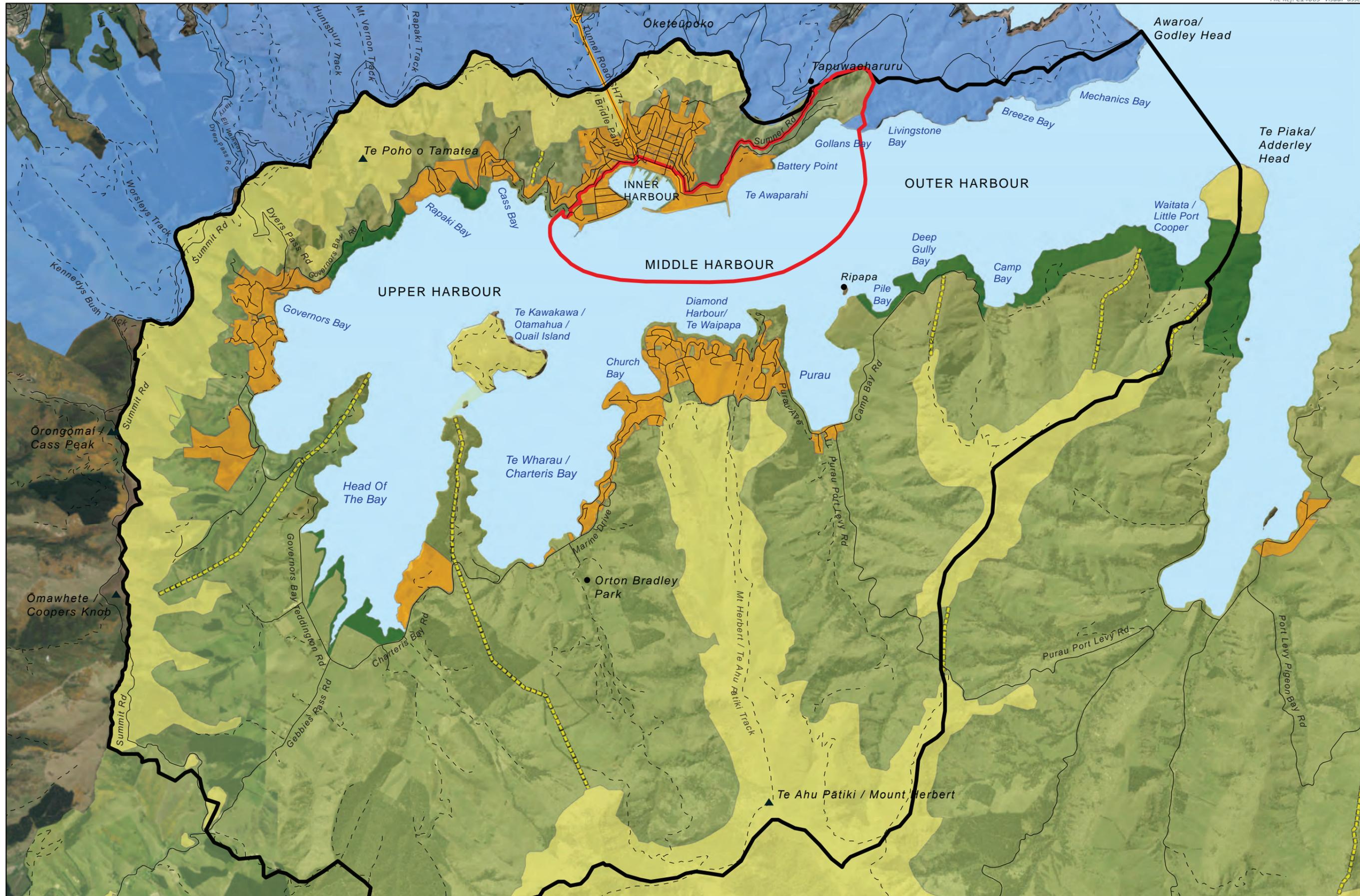
Cruise ships are part of a growing tourism sector for Canterbury. We are considering how to cater for cruise ships in a commercially sustainable way. Part of this involves looking at Inner and Outer Harbour development options.

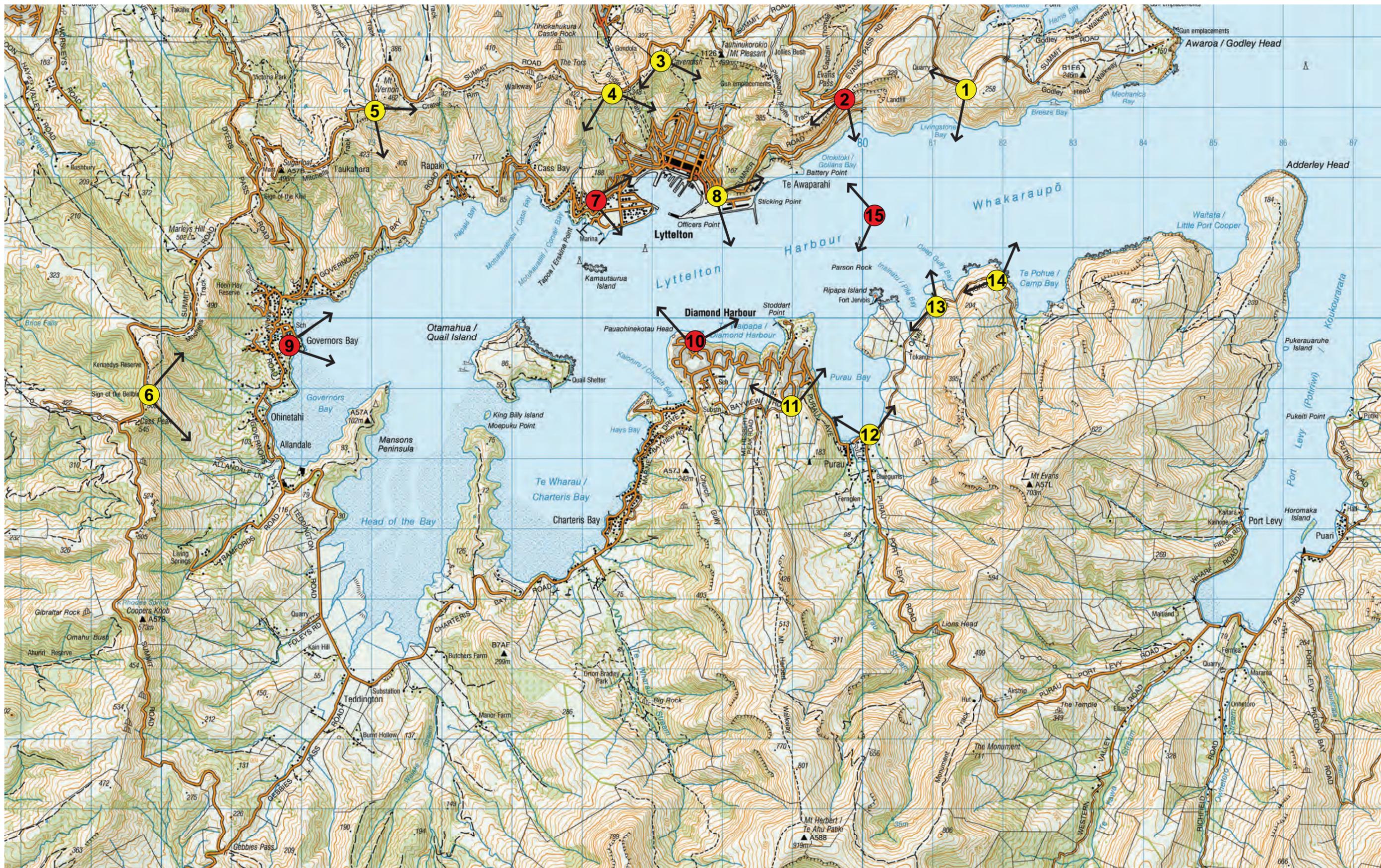


Dredging

International trends are towards larger ships and to be competitive we need to deepen and lengthen the navigation channel. We have prepared a resource consent application and are focused on progressing this important development project. A number of rebuild and enhancement projects will also require capital dredging and disposal of spoil.









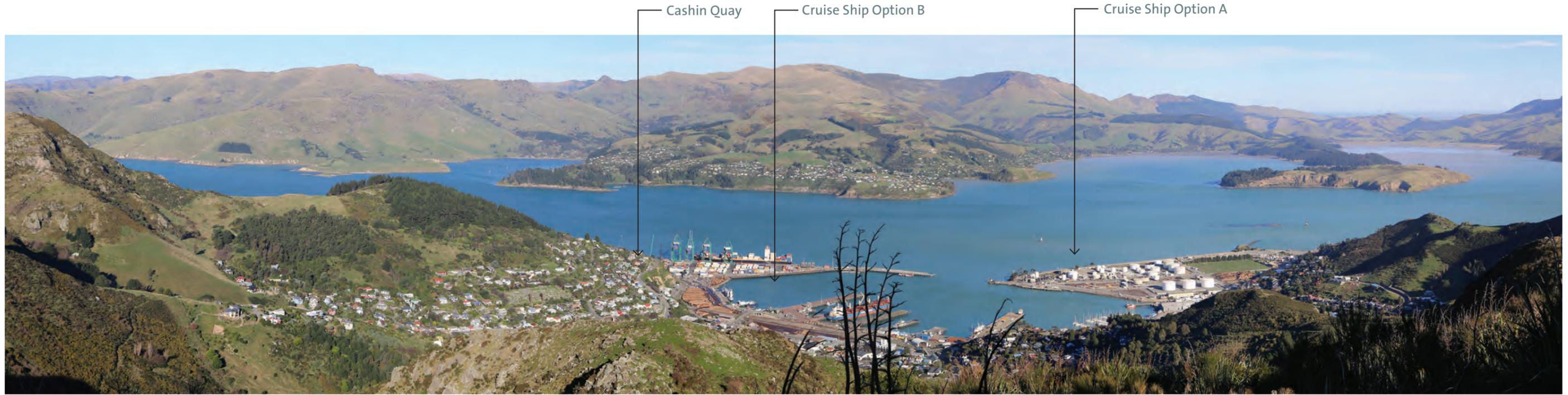
Viewpoint 1: At Livingstone Bay looking southwest towards the existing Lyttelton Port reclamation on Cashin Quay | Photograph taken 21/10/14, 12.19pm | Canon 6D



Viewpoint 2: At Evans Pass looking southwest towards Lyttelton Port | Photograph taken 31/07/14, 2.20pm | Canon 6D



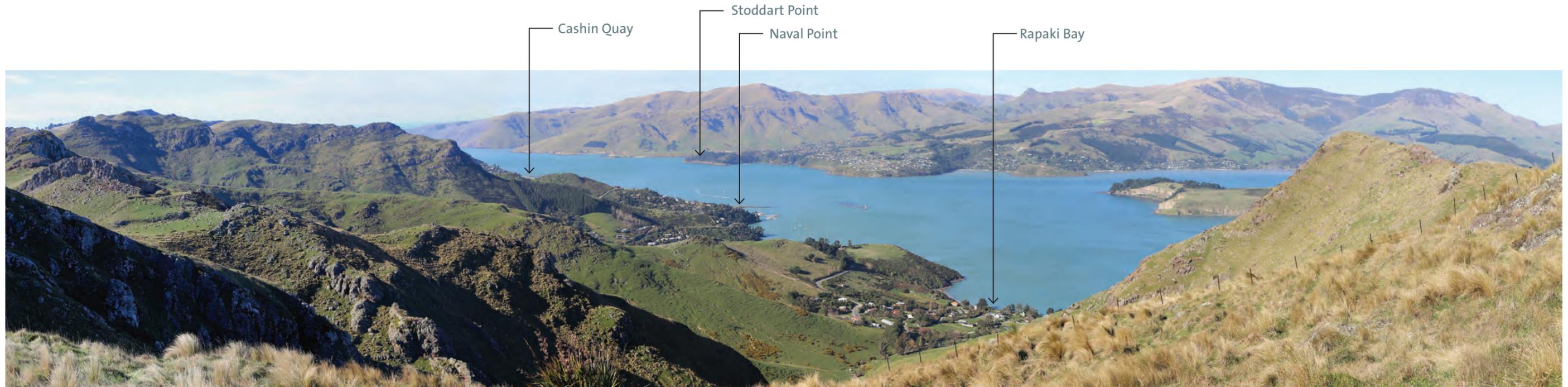
Visualisation 2: At Evans Pass looking southwest towards Lyttelton Port and the proposed Container Terminal | Photograph taken 31/07/14, 2.20pm | Canon 6D



Viewpoint 3: From the Gondola Building at Mt Cavendish, showing views of the eastern slopes of Lyttelton and Lyttelton Port | Photograph taken 31/07/14, 2.41pm | Canon 6D



Viewpoint 4: The majority of Lyttelton Port can be seen from the Bridle Path Summit | Photograph taken 02/08/14, 1.00pm | Canon 6D



Viewpoint 5: Summit Road near Mt Vernon. Lyttelton Port is obscured by the numerous ridge lines of the Lyttelton Harbour Crater | Photograph taken 31/07/14, 12.45pm | Canon 6D



Viewpoint 6: Summit Road at Sign of the Bellbird, looking northeast down Lyttelton Harbour. Lyttelton can be seen at the far centre left | Photograph taken 07/08/14, 12.47pm | Canon 6D



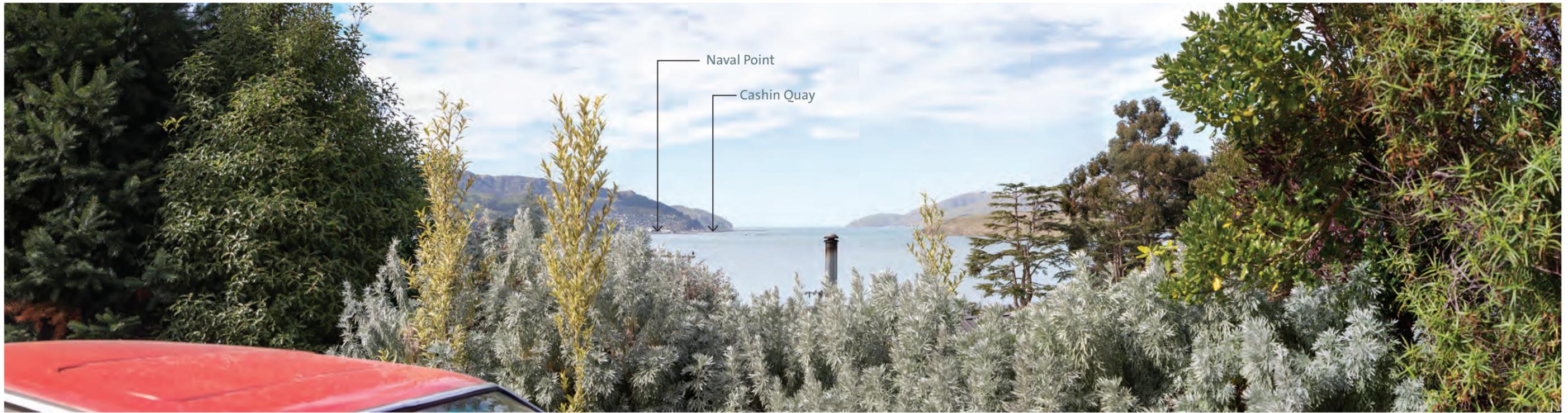
Viewpoint 7: Looking east towards Lyttelton Port from Cressy Terrace | Photograph taken 19/06/14, 11.34am | Canon 6D



Visualisation 7: Looking east towards Lyttelton Port from Cressy Terrace showing the proposed Container Terminal | Photograph taken 19/06/14, 11.34am | Canon 6D



Viewpoint 8: Reserve Terrace, looking southeast towards Cashin Quay | Photograph taken 08/09/14, 12.37pm | Canon 6D



Viewpoint 9: | View eastwards from Merlincote Crescent, Governors Bay | Photograph taken 12/09/14, 1:57pm | Canon 6D



Visualisation 9: | View eastwards from Merlincote Crescent, Governors Bay showing the proposed Container Terminal in the distance | Photograph taken 12/09/14, 1:57pm | Canon 6D



Viewpoint 10: Lyttelton Port and Port Hills from Koromiko Crescent, Diamond Harbour | Photograph taken 04/07/14, 10.52am | Canon 6D



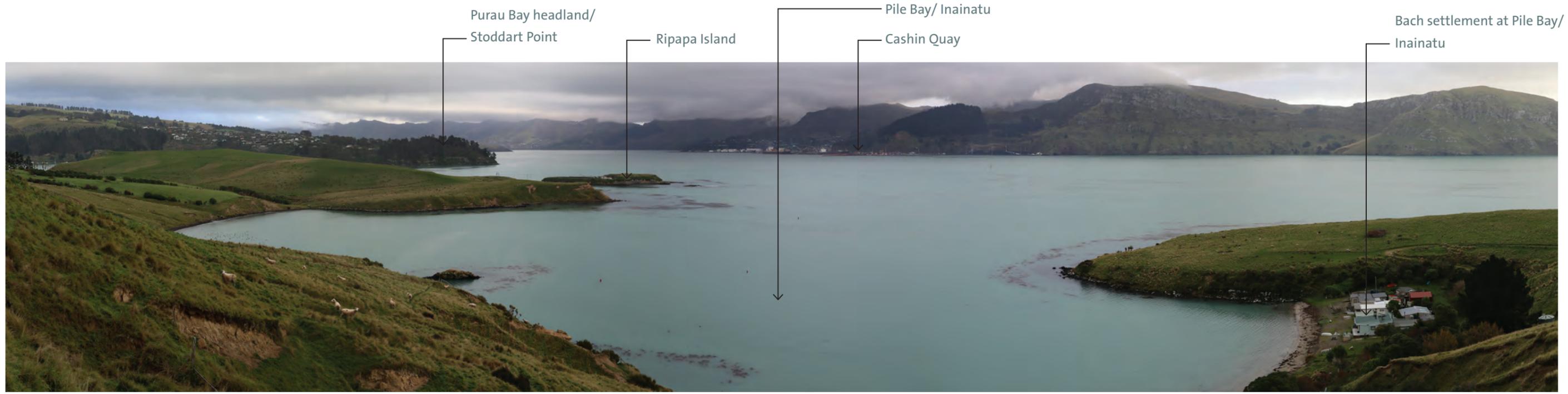
Visualisation 10: Lyttelton Port and Port Hills from Koromiko Crescent, Diamond Harbour showing proposed Container Terminal | Photograph taken 04/07/14, 10.52am | Canon 6D



Viewpoint 11: View northwards from Waipapa Avenue, Diamond Harbour | Photograph taken 19/06/14, 10.00am | Canon 6D



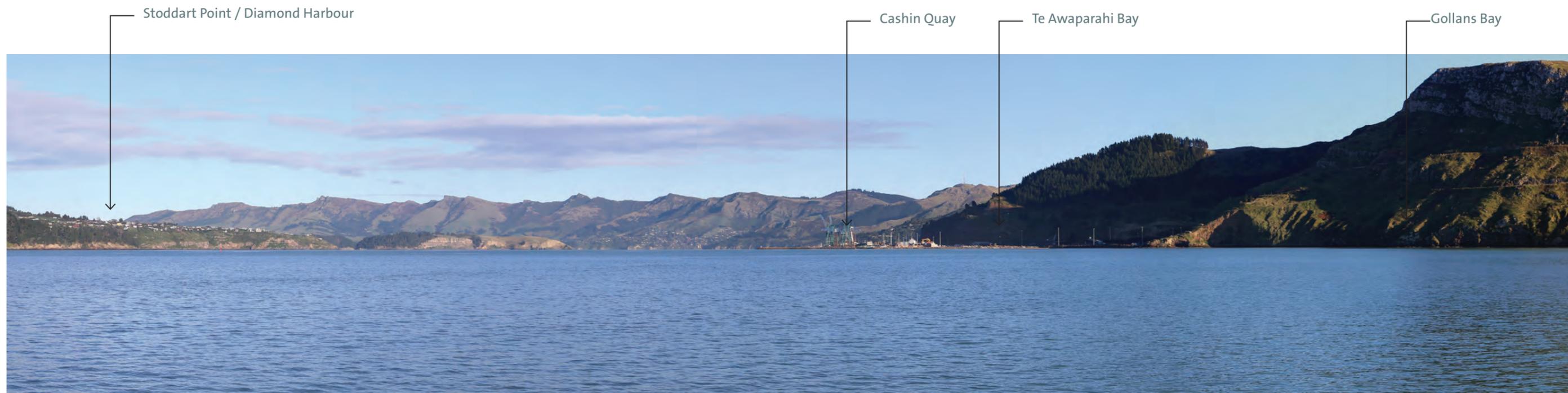
Viewpoint 12: View looking northwards from Purau Bay Beach showing existing coal storage area and buildings near the current reclamation | Photograph taken 19/06/14, 9.52am | Canon 6D



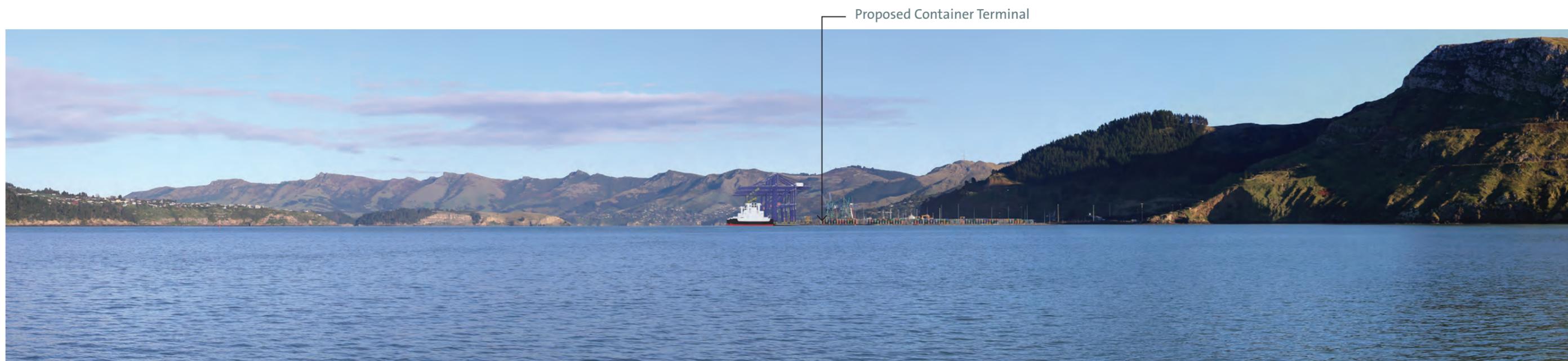
Viewpoint 13: View looking northwest from Pile Bay/ Inainatu, towards Lyttelton Harbour | Photograph taken 19/06/14, 9.43am | Canon 6D



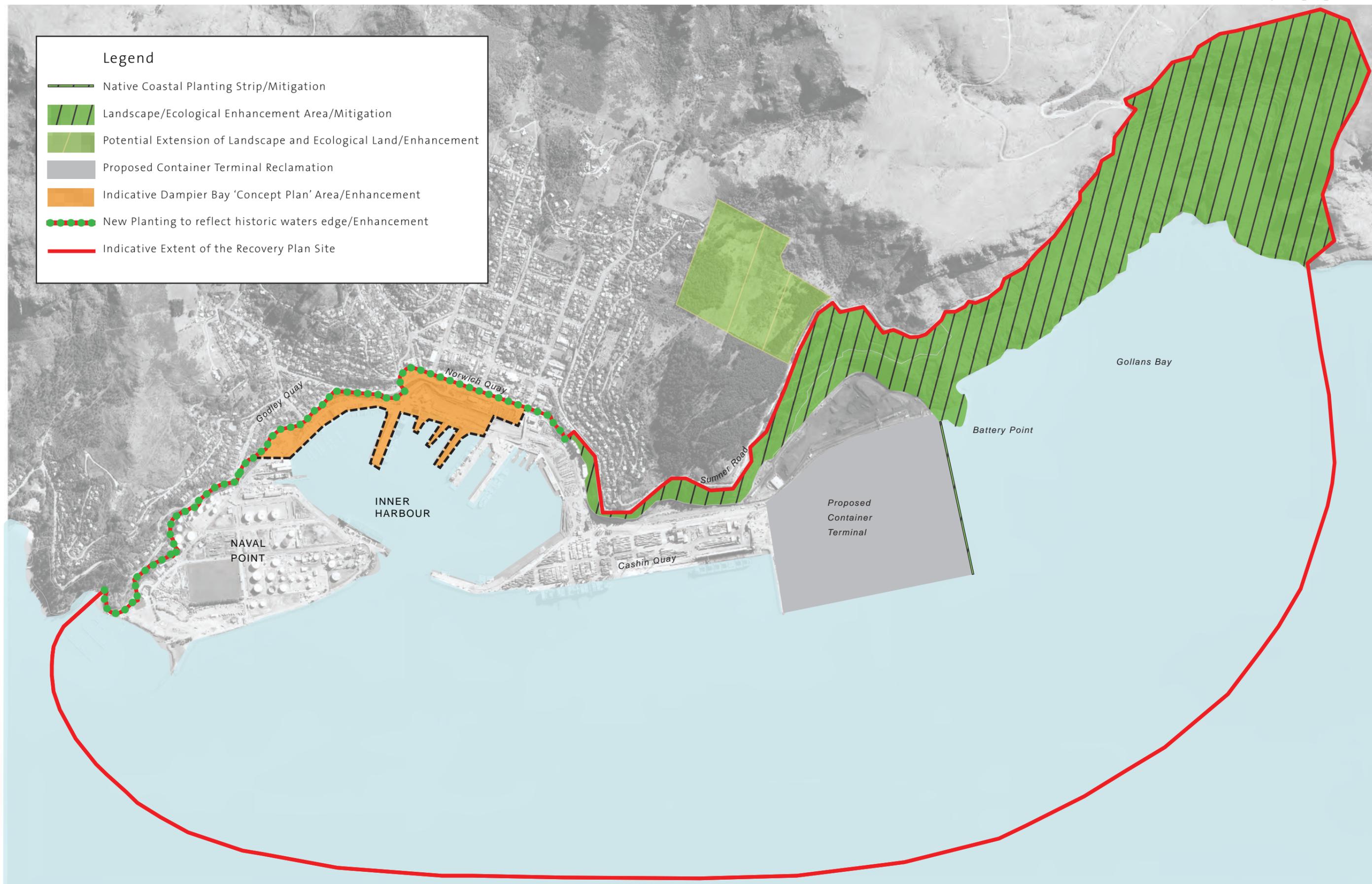
Viewpoint 14: | Northwest view towards Lyttelton from Camp Bay Road, between Deep Gully Bay and Camp Bay | Photograph taken 19/06/14, 9.39am | Canon 6D



Viewpoint 15: | View from on the harbour water looking towards Lyttelton Port, approximately 900m distance from proposed reclamation edge | Photograph taken 15/06/14, 9.32am | Canon 6D



Visualisation 15: | View from on the harbour water looking towards Lyttelton Port, approximately 900m distance from proposed reclamation edge showing proposed Container Terminal | Photograph taken 15/06/14, 9.32am | Canon 6D



Legend

- Native Coastal Planting Strip/Mitigation
- Landscape/Ecological Enhancement Area/Mitigation
- Potential Extension of Landscape and Ecological Land/Enhancement
- Proposed Container Terminal Reclamation
- Indicative Dampier Bay 'Concept Plan' Area/Enhancement
- New Planting to reflect historic waters edge/Enhancement
- Indicative Extent of the Recovery Plan Site



Gollans Bay Quarry Haul Road Recovery Plan Proposal



Gollans Bay Quarry Haul Road Recovery Plan Proposal Overlaid on Consented Alignment

Production of Photo Simulations

INTRODUCTION:

Photographic Simulations are an additional tool to assist in assessing visual effects of a proposal. They can accurately portray in a realistic manner and context, a proposed change or modification in the landscape (NZILA Best Practice Guide- Visual Simulations, 2010). It is important to recognise that photo simulations do not represent 'real life views', however, they are an extremely helpful tool in assisting decision makers make a more informed and transparent judgement based on the appearance of the proposal which will assist them in better determining the level of effects.

1. SITE VISIT AND DATA PREPARATION

Once simulation viewpoints have been selected, a site visit is undertaken to take photos and capture GPS data. A geographically aware computer model is constructed from survey data, and proposed elements are inserted into the correct position within this model. This forms the base model'. The GPS viewpoint data is then added to the base model, and a virtual camera is created at each viewpoint which has all the same properties (focal length, aspect ratio, field of view) as the actual camera used to take the photos on site.

2. SYNCRONISATION AND RENDERING

Once the virtual camera is created, the view is synchronized with the photograph inside the base model using known references within the photo and existing landforms or landscape features. The view is then rendered by the software which applies the correct lighting and shadows for the geographic location, date and time, and also applies any materials/textures to the 3D model.

3. COMPOSITING

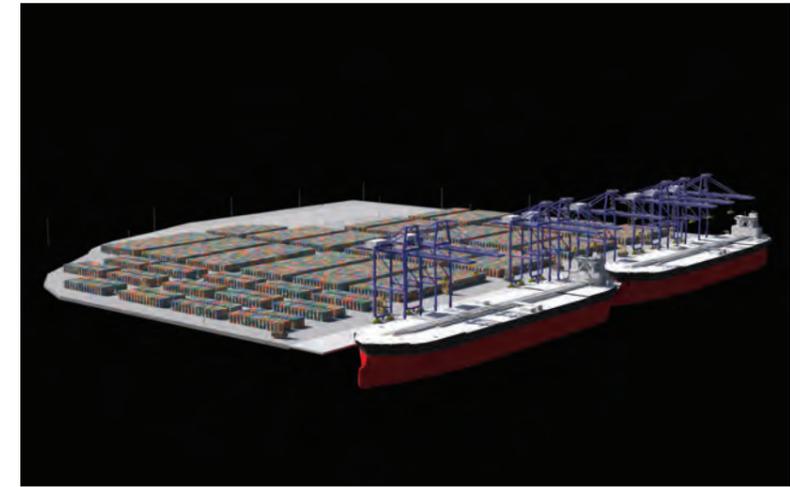
The computer generated image is then overlaid onto the actual photo using image editing software. The image is then blended and adjusted to match any specific conditions of the viewpoint. Site photos of existing structures in similar conditions (weather, time, orientation etc) are used to check the accuracy of the blended image. Pages are then laid out to place the final simulation next to the un-edited site photo. This allows for direct comparison between existing and proposed images.



1. GPS and camera



2. Viewpoint information inside CAD model



3. perspective view of CAD model



Image 4: Photographic viewpoint with CAD model overlaid

Data sources

| Data | Source | Date recieved | Note |
|---------------------------------|---------------------------|---------------|---------------------------|
| Reclamation and terminal layout | Tonkin and Taylor | 12/08/2014 | |
| Aerial photography | Lyttelton Port Company | 02/07/2014 | flown 13 March 2014 |
| Contour and topography | Lyttelton Port Company | 02/07/2014 | 1m contour interval |
| Topographical survey | Lyttelton Port Company | 02/07/2014 | |
| Quarry Design Contours | Mine Design | 02/12/2009 | |
| Aerial LiDAR - all returns | Christchurch City Council | 11/06/2012 | flown May 2011 |
| | | | |
| Crane | Google 3D Warehouse | | 80m high |
| Straddle | Google 3D Warehouse | | 12m high |
| Freight Container | Google 3D Warehouse | | 2.5 high (stacked 3 high) |
| Container ship | Google 3D Warehouse | | 375m long |

