OTAGO REGIONAL COUNCIL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application by Port Otago Limited for resource consents for Project Next Generation

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DECISION OF COMMISSIONERS APPOINTED BY OTAGO REGIONAL COUNCIL AND MINISTER OF CONSERVATION

Volume 1 of 2

17 June 2011

Commissioners:

John Lumsden, Chair (Christchurch)
Hugh Leersnyder (Auckland)
Michael Johnston (Nelson)

DECISION

1 **Having carefully considered all the relevant reports and documentation supplied with the application, submissions, and the evidence presented to us during the course of the hearing, we have determined that the Project Next Generation proposal should be allowed to proceed, as proposed, subject to the imposition of conditions.**

2 **In terms of s.113(1)(a) of the Act we are required to give reasons for our decision. Throughout Section 6 of this decision we have considered the environmental effects that were brought to our attention and have drawn our own conclusions as to how each of these issues impacts on our decision. Having done so, we have undertaken an overall evaluation of the adverse impacts of the proposal in light of the expected positive effects.**

3 **We have concluded that there are significant benefits to the proposal and that it would promote the sustainable management of natural and physical resources and is, therefore, consistent with the purpose of the Resource Management Act 1991.**

4 **In exercising the powers delegated to us by Otago Regional Council, we have resolved:**

a) **to grant resource consent applications (2010.193-200; 2010.202-203; and RM.10.193.01) sought by Port Otago Limited, pursuant to s.104 of the Resource Management Act 1991; and**

b) **to grant the application to vary Resource Consent 2000.472 (2000.472-V1) sought by Port Otago Limited, pursuant to s.127 of the Resource Management Act 1991.**

5 **We have also resolved to grant the consents for the terms sought.**

6 **In accordance with s.108, conditions are attached to these consents (Volume 2). We record that a number of conditions were suggested by some submitters and we have taken these into account in arriving at the final conditions.**

Contents of Volume 1

Contents of Volume 2

CONSENTS AND CONDITIONS

1 INTRODUCTION

1.1 Background

[1] The applicant, Port Otago Limited (**POL**), is the successor to the elected Otago Harbour Board and is wholly-owned by Otago Regional Council (**ORC**). POL owns the land-based commercial port infrastructure at both Dunedin and Port Chalmers, and has occupancy rights to the CMA at and adjacent to its berths and commercial port undertakings. POL currently maintains the commercial shipping channels, berths and swinging basin within Otago Harbour in accordance with the permitted activity rules contained within the Otago Regional Plan: Coast.

[2] POL is preparing for the next generational shift in shipping services, specifically the use of larger container vessels and/or an increase in the number, frequency and duration of all vessels visiting Port Chalmers. To meet these demands, POL proposes to upgrade its port facilities and is seeking the necessary consents under the Resource Management Act (1991) (**the Act**). The proposal has been named Project Next Generation (**PNG or the proposal**).

[3] The proposal put forward by POL involves channel dredging (deepening, widening and maintaining the channel in the Lower Harbour, the swinging basin and the Port Chalmers berths), spoil disposal at sea, and construction of a wharf extension and a new fishing platform. Eleven separate consents (Coastal Permits) are sought. In addition, a change of conditions is sought in relation to an existing consent (Coastal Permit No. 2000.472) relating to the disposal of dredged material at the existing spoil sites outside the entrance to Otago Harbour.

[4] The proposed works would take place in the coastal marine area[1] (**CMA**), being publicly-owned foreshore and seabed administered by the Department of Conservation (**DOC**). Prior to 1 April 2011, which includes the time of lodgement and notification of the PNG application, this area was subject to the provisions of the Foreshore and Seabed Act 2004 (**FSA**). The FSA was repealed on 31 March 2011 and replaced with the Marine and Coastal Area (Takutai Moana) Act (**MACAA**) as of 1 April 2011. The area of the PNG application is now subject to the provisions of the MACAA.

[5] POL holds Coastal Permit 2000.472 for the discharge into the sea of up to a maximum of 450,000 cubic metres per year of dredging spoil derived from maintenance dredging and incremental improvements to the channel and berth areas in and about the Otago Harbour, in

[1] As defined in Section 2 of the Act.

accordance with the following specific maximum annual discharge quantities at each of three specific disposal sites:

- Heyward Point Spoil Relocation area (200,000 m^3)
- Aramoana Spit Relocation area (200,000 m^3)
- Shelly Beach Renourishment area (50,000 m^3)

It is noted that Coastal Permit 2000.472 was granted for a duration of 10 years and this consent expires on 1 December 2011.

[6] The application was received by ORC on 27 May 2010 and was publicly notified on 19 June 2010. The statutory submission period was doubled to recognise the scale and complexity of the activities and, thus, closed on 13 August 2010. A total of 198 submissions were received. 150 of these were in opposition to the proposal, 35 submissions were in support (including 3 subject to conditions), and 13 were neutral. 7 submissions were received after the extended submission closing date. We note that the s.42A Planning Report acknowledged receipt of 198 submissions, including the late submissions, which were accepted by ORC. A list of submitters and a synopsis of the issues raised is attached to this decision in Appendix 2.

[7] This application, the hearing and our decision are subject to the terms of the Resource Management Act 1991, as amended in July 2010 (*Resource Management (Simplifying and Streamlining) Amendment Act 2009*).

1.2 Hearing Procedure

[8] Independent commissioners, appointed by ORC and the Minister of Conservation (MOC) to hear and determine the resource consent applications were as follows:

- **Mr John Lumsden**, Christchurch (ORC), Chair
- **Mr Hugh Leersnyder**, Auckland (ORC)
- **Dr Michael Johnston**, Nelson (MOC)

[9] The hearing commenced on Monday, 4 April 2011, and was completed on Tuesday, 19 April 2011. The hearing venue, for the most part, was the ORC Council Chamber, Regional House, 70 Stafford Street, Dunedin. One day (Tuesday, 12 April 2011) was spent hearing *iwi* submissions on the Ōtākou Marae.

[10] On Friday, 8 April 2011, we carried out a site visit accompanied by Mr Chris Shaw and Ms Suzanne Watt from ORC. In doing so, we travelled by car to Aramoana where we walked along the Mole and visited the wetland/sand-flats reserve area. We also were shown around the wharves at Port Chalmers and inspected the area where the proposed extensions to the Multi-

purpose Wharf would be constructed. Whilst at Port Chalmers some time was spent at Careys Bay. Later, we flew by helicopter from Port Chalmers, over the channel in the Lower Harbour to the entrance at Taiaroa Head, then over the proposed disposal site and across Blueskin Bay to Karitane. We then returned to Port Chalmers along the coast, passing Warrington, Purakanui, Long Beach, Heyward Point and viewed various points of interest in the harbour including Te Rauone Beach, and the Portobello Marine Laboratory. On Thursday evening, 14 April 2011, we returned to Port Chalmers to view, and listen to, port operations at night from several residential areas close to the port, including Careys Bay.

1.3 Appearances

[11] Legal submissions on behalf of the applicant were presented by **Mr Len Andersen** (Counsel) assisted by **Ms Jackie St John** (Anderson Lloyd). **Ms Pene Williams** (Counsel) appeared on behalf of the Director-General of Conservation. **Mr Brett Gray** (Counsel) appeared on behalf of South Coast Board Riders Association Inc.

[12] The majority of submitters appearing at the hearing presented their own submissions or those of their organisations. Some called witnesses to present evidence on their behalf.

1.4 Acknowledgements

[13] We gratefully acknowledge the contributions and help received from the applicant, counsel, witnesses, submitters, and council staff, throughout the hearings process. In particular, we wish to thank all parties for the manner in which they conducted themselves during the hearing. We especially acknowledge the welcome and the hospitality we received during the day spent hearing submissions on the Ōtākou Marae.

2 THE APPLICATION

2.1 Description of the proposed activity

Harbour channel

[14] The Lower Channel in Otago Harbour, from Port Chalmers to the open sea, is some 13 km long and extends to the "Landfall Tower", which is situated off Taiaroa Head at the entrance to the harbour. The existing channel is currently maintained at a minimum depth of 13.0 metres below chart datum, increasing to a minimum of 14.5 metres north of the end of the Mole, which is situated near the harbour entrance at the end of Spit Beach.

[15] The approach channel is to be increased to a minimum declared depth of 17.5 metres below chart datum from the Landfall Tower (0.00 metres) to chainage 2,500 metres (a point just north of the Mole End). A slight realignment of the centreline of the direction of approach to the harbour entrance is proposed and this would require up to 65 metres widening of the channel to be carried out on the western edge of the entrance channel. From chainage 2,500 metres the depth is to be reduced to a declared depth 16.0 metres below chart datum to chainage 5,600 metres, being a point approximately two thirds of the way around Harington Bend. Over the next 1,000 metres to chainage 6,600 metres, the sea bed would gradually slope up to achieve a depth of 15.0 metres and continue at that depth for the remainder of the channel up to and including the Port Chalmers basin. Photographs and map showing the harbour channel, and the various features referred to, are appended to this decision in Appendix 1.

[16] To minimise the volume of dredging required, thereby reducing and minimising cost and potential adverse environmental effects, the proposed upgraded channel would follow the alignment of the existing channel as closely as possible. The proposed channel modifications would also be designed to avoid sites of significant ecological value such as the Aramoana wetlands/sand-flats reserve.

[17] In order to achieve the declared depth, overdredging of up to 0.5 metres south of the Mole End, and up to 1.0 metre north of the Mole End would be required. The greater depth of overdredge allowance required north of the Mole is due to the larger sea-swell in that area increasing the movements of the dredge, which makes accurate depth control of the drag-head more difficult.

[18] Although a suction dredge is expected to be used for most of the work, some rock removal would be necessary at Acheron Head and Rocky Point, which would require the use of explosives and a backhoe dredge or grab dredge.

Swinging basin and berths

[19] The width of the swinging basin at the port is proposed to be increased by up to 115 metres, which would require a significant volume (approximately 710,000m^3) of dredging to be carried out along the eastern edge. The declared depth in the swinging basin is to be increased to 15.0 metres.

[20] The berths alongside the present Container and Multi-purpose Wharves are to be deepened to 16 metres and widened from 37 to 50 metres including the area alongside the proposed extension to the Multi-purpose Wharf.

Dredging programme

[21] The volume of material proposed to be removed from the Lower Channel, swinging basin and berths is up to 7.2 million cubic metres. This volume includes an allowance for overdredging to an average depth of 0.3 metres over the whole of the dredged area.

[22] Port Otago plans to upgrade the channel in three stages:

- Extension of the current maintenance dredging programme in the whole harbour using existing POL plant (the "New Era" dredge or one of similar size and capacity). This would be achieved by increasing the hours of work and including development dredging. This would result in up to 1.45 million m^3 of spoil being removed each year (including the spoil from maintenance dredging).
- Carry-out work requiring a backhoe or grab dredge being: rock removal and excavation alongside the berths, and the preliminary removal of spoil down to a depth of approximately 9 metres in the swinging basin and bends of the channel in order to give a larger suction dredge access to those areas. A rock revetment would be necessary to stabilize the sloping edge of dredged basin along the berth area.
- Completion of the remaining capital dredging by an international dredging contractor using a large specialist Trailer Suction Hopper Dredge (**TSHD**). This would likely only be undertaken once shipping companies notify POL of the imminent arrival of larger ships.

Spoil disposal

[23] The dredge spoil is expected to comprise sand (62%), silt (34%), clays (3%) and rock (1%).

[24] Spoil disposal from authorised dredging under Coastal Permit 2000.472 will continue to be disposed at the existing disposal sites up to the volumes permitted [Para 5]. This includes managing the disposal at these sites to ensure that 90% of the capital dredging material disposed over any 12 month period is sand. Coastal Permit 2000.472 expires on 1 December 2011 and renewal is to be sought, although not as part of this application, which seeks only to vary the conditions of the existing consent so as to allow spoil from the proposal to be disposed at the existing sites.

[25] The rock from Rocky Point and Acheron Head that is not required for the berth areas would be disposed at the present Heyward Point site and would be part of the existing volume permitted to be deposited at that site. A variation to the existing consent for disposal at the site is being sought for this activity as part of this application.

[26] The balance of the dredge spoil is proposed to go to a new offshore disposal site, denoted as "A0", located in approximately 27 metres of water, some 6.5 km NE of Taiaroa Head. This site would not be used for the disposal of spoil from maintenance dredging. A map showing the location of the proposed spoil site (A0) is included in Appendix 1.

Multi-purpose Wharf extension and fishing jetty

[27] The proposed extension to the Multi-purpose Wharf is 135 metres long and varies in width from 28 metres to 37 metres. The variation in this width is due to the change in alignment of the top of the rock slope of the existing reclamation. The extension is within that part of the CMA occupied by Port Otago.

[28] Steel H piles or, possibly, tubular steel piles would be used to support the new wharf extension. Reinforced concrete pile collars would be provided in the intertidal zone to provide corrosion protection, buckling resistance and mechanical protection for the piles above and below the waterline. Precast pile caps would be placed on top of the collars to support the wharf deck. Cathodic protection is also proposed. The new wharf deck would be constructed using 300 mm pre-cast slabs as the formwork with a 500 mm thick layer of concrete forming the top of the deck.

[29] The proposed fishing jetty extends 30 metres into the CMA and is separated both vertically and horizontally from the Multi-purpose Wharf. Access to the jetty would be via the existing Boiler Point Walkway and independent of the port working area. The fishing jetty would have wooden decking with railing over a concrete substructure that is light duty with no vehicle loadings designed for or expected. Piles may be either steel or concrete.

[30] More detailed evidence concerning the proposed activities was provided in the evidence presented on behalf of POL, particularly that of Mr Coe, and we shall refer to this later. A plan of Port Chalmers, as proposed, is included in Appendix 1 (Figure 4).

2.2 Consents sought

[31] Details of the activities for which consents were sought were provided in the s.42A Planning Report. These are summarised in the following table.

Consent type	Activity	Activity Status	Term sought
Coastal Permit Application Number 2010.193	To disturb and remove up to 7.2 million m^3 of dredged material from the foreshore and seabed for the purpose of deepening and widening the lower harbour channel, Port Chalmers swinging and berthing areas to a maximum design depth of 17.5 m.	**Discretionary** and **Restricted Coastal Activities** under Rule 9.5.2.2 and Rule 9.5.3.3 of the RCP.	20 years
Coastal Permit Application Number 2010.194	To disturb and remove natural material from the foreshore and seabed for the ongoing maintenance dredging of the lower harbour channel, Port Chalmers swinging and berthing areas to a maximum design depth of 17.5 m.	**Discretionary** and **Restricted Coastal Activities** under Rule 9.5.2.2 and Rule 9.5.3.3 of the RCP.	35 years
Coastal Permit Application Number 2010.195	To discharge decant water and all associated contaminants from the channel upgrading dredging operation.	**Discretionary Activity** under Rule 10.5.6.2 of the RCP.	20 years
Coastal Permit Application Number 2010.196	To discharge decant water and all associated contaminants from the channel upgrading dredging operation.	**Discretionary Activity** under Rule 10.5.6.2 of the RCP.	35 years
Coastal Permit Application Number 2010.198	To deposit up to 7.2 million m^3 of dredge material sourced from the channel upgrading works and maintenance dredging at the new off-shore disposal site A0.	**Discretionary** and **Restricted Coastal Activities** under Rule 9.5.4.2 of the RCP.	20 years
Variation to Consent 2000.472 Application Number 2000.472-V1	To vary the purpose and conditions of existing Resource Consent 2000.472 to authorise the disposal of dredge material derived from the dredging of the shipping channel or within Otago Harbour from activities associated with the operation and maintenance of Port Chalmers facilities, in accordance with the following existing maximum annual discharge quantities at the following locations: Heywards Point disposal site (200,000 m^3), Spit Beach (Aramoana) disposal site (200,000 m^3), South Spit (Shelly Beach) disposal site (50,000 m^3).	Application to vary consent conditions of an existing permit is pursuant to Section 127 of the Act.	Not applicable

Coastal Permit Application Number 2010.197	To disturb and deposit up to 30,000 m^3 of rock rip rap to form a rock buttress under the Container Wharf and Multi-purpose Wharf and their associated berths at Port Chalmers to improve foreshore and seabed stability.	**Discretionary Activity** under Rules 9.5.3.6 and 9.5.4.3 of the RCP.	10 years
Coastal Permit Application Number 2010.199	To construct a new public-use fishing jetty at Boiler Point.	**Discretionary Activity** under Rule 8.5.1.9 of the RCP.	10 years
Coastal Permit Application Number 2010.200	To extend the existing Port Chalmers multipurpose wharf by 135 m.	**Discretionary Activity** under Rule 8.5.1.9 of the RCP.	10 years
Coastal Permit Application Number 2010.202	To disturb up to 4,500 m^2 of the CMA whilst erecting the fishing jetty and extending the Port Chalmers Multi-purpose Wharf.	**Discretionary Activity** under Rule 9.5.3.6 of the RCP.	10 years
Coastal Permit Application Number 2010.203	To discharge contaminants to the CMA whilst depositing rock rip rap, constructing the fishing jetty and extending the Port Chalmers Multi-purpose Wharf.	**Discretionary Activity** under Rule 10.5.6.2 of the RCP.	10 years
Coastal Permit Application RM.10.193.01 (New)	To occupy the CMA with the fishing jetty.	**Discretionary Activity** under Rule 7.5.1.5 of the RCP.	35 years

[32] The s.42A Planning Report notes at [174] that, since this proposal was notified, it has been identified that the exclusive occupation of the coastal marine area by the fishing jetty will not be authorised by Coastal Permit 2010.011, which allows POL to occupy the coastal marine area for the purposes of operating and managing an existing port. Hence, a separate permit (RM.10.193.01) is required for occupation of the CMA by the fishing jetty.

[33] The Planning Report also notes at [171] that Application 2010.205 is no longer required as it has been incorporated in Application 2010.203.

3 EXISTING ENVIRONMENT

3.1 Physical environment

[34] Both the application and the s.42A Planning Report provide helpful summaries of the existing environment.

[35] Otago Harbour is thought to be about 6,000 years old and was formed when a rise in sea level flooded two valleys in the eroded Miocene Dunedin Volcano. Since its formation, the harbour has been subjected to infilling from sand swept in from the continental shelf and, to a considerably lesser extent, by from sediments eroded from the surrounding catchment.

[36] Peninsulas at Port Chalmers and Portobello, and adjacent islands, divide Otago Harbour into upper and lower basins. Generally, the harbour is relatively shallow with an average depth of 3.3 metres below mean sea level. Outside the main dredged channels, water depths are mostly less than 2 metres and nearly 30% of Otago Harbour comprises exposed sediment flats at low spring tides. The main channel between Port Chalmers and Dunedin is maintained to a depth of 7.5 metres below Chart Datum but, from Port Chalmers to the entrance, the channel depth is maintained at 13 metres with a 14.5 metres depth outside the Mole. There are also several naturally deep areas (>20 metres) in the main navigation channel from Harington Bend to the Mole, and between Quarantine and Goat Islands (up to 30 metres depth). Otago Harbour is the only large non-estuarine inlet on the southeast coast of New Zealand and has a number of important sheltered water habitats that are not widely represented elsewhere in this bio-geographic region.

[37] Sediments in Otago Harbour range from silt to coarse sand containing shell fragments. Sand is most commonly encountered in the channel sections near the entrance to the harbour. Clayey-silt is most prominent from the Swinging Basin at Port Chalmers to the Cross Channel sections. Silty-clay was the least common sediment type encountered and is most prominent in the area around Acheron Head. Rock is only encountered at Rocky Point and Acheron Head, and consists of completely weathered basalt (cobbles and boulders) near the seabed and moderately weathered basalt at depth. The sediment that is proposed to be dredged is predominantly fine sand, with the secondary volume being clayey-silt.

[38] The tidal compartment of the harbour (the amount of water flowing in and out during a tidal cycle) is between 6.9×10^7 cubic metres and 7.5×10^7 cubic metres. The spring tidal range is 1.98 metres at Port Chalmers and 2.08 metres at Dunedin, while the neap tidal range is 1.25 metres at Port Chalmers and 1.35 metres at Dunedin.

[39] Otago Harbour has been substantially modified by human activity through reclamation, causeway and groyne construction, dredging and channel stabilisation, catchment modification and lining the harbour shoreline with seawalls. Reclamation has resulted in a reduction of the harbour tidal compartment. Most of the shoreline of the Upper Harbour has been modified, and is comprised of placed rock. Training walls and groynes also play an important role in determining the hydrodynamic flow of the harbour, stability of the position of the navigation channel and sediment movement on the shores and harbour bed.

[40] According to Single *et al*, (2010)[2], the offshore physical environment has also been modified by human activities. These include modification of the harbour inlet through construction of the Mole and the Long Mac wall, and by dredging of the harbour channel, disposal of dredged sediment at the Heyward and Spit sites and at Shelly Beach. Construction of the Mole has led to sediment accumulation on Aramoana Beach. Conversely, the beach area between the Mole and Harington Point (Shelly Beach) has retreated.

[41] Between 1846 and 1994, shoreline position and sediment transport at Aramoana was significantly altered by coastal engineering structures. Progradation of Aramoana Beach after the Mole construction (from 1884) indicates sediment has accumulated on the updrift side. The beach area between the Mole and Harington Point (Shelly Beach) retreated rapidly after construction of the Mole, indicating the beach is on the downdrift side of the Mole and starved of sediment.

[42] Accumulation of sediment on the disposal site at Aramoana has also occurred during years when no dredged sediment has been placed there. Accordingly, it is likely that a combination of natural and human sediment inputs are occurring at Aramoana. At Shelly Beach, sediment placement has been carried out to provide sand as nourishment to the eroding beach. Retention of placed dredged sediment on Shelly Beach and in the nearshore south of the Mole has assisted in mitigating the erosion hazard to the beach.

[43] Maintenance and development dredging of the shipping channel in Otago Harbour has been carried out since 1865. About 34 million cubic metres of sediment have been dredged from the harbour in that time. Disposal of dredged sediment has occurred off Heyward Point, the Spit and at Shelly Beach.

[44] Otago Harbour has a number of residential settlements located along its shoreline, the most notable being Port Chalmers, though many other settlements including; Deborah Bay, Te

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[2] Single, M; Bell, R; McComb, P: (2010), *Physical coastal environment of Otago Harbour and offshore: Assessment of effects of proposed dredging by Port Otago Limited*. 75pp.

Ngaru, Aramoana, Harington Point, Otakou, and Harwood are located adjacent to the Lower Harbour.

[45] Inflows from modified urban and rural catchments have resulted in changes to the sediment supply and chemistry in parts of the harbour.

[46] We consider it is important to understand the existing physical environment in order to put the changes that would occur because of the proposed dredging into a proper perspective. We shall refer to the existing environment with respect to other matters, such as tangata whenua, ecology and water quality, later in our discussion of the issues and effects in Section 6.

4 SUMMARY OF EVIDENCE AND SUBMISSIONS

4.1 Applicant's opening submissions

[47] **Mr Len Andersen**, counsel for POL, introduced the applications and spoke to his written submissions. He first explained how PNG is essential to both the port and the catchment it serves. In briefly explaining the history of the port, Mr Andersen noted that dredging had been an ongoing feature since use of the harbour for shipping commenced around 1865. Dredging has been necessary to maintain depths due to natural sedimentation, and the need to increase depths as the size of ships increased. Therefore, what was proposed was not something new that would be imposed on the environment.

[48] POL currently maintains the depth of the shipping channel and the swinging basin at Port Chalmers. According to Mr Andersen, these are permitted activities under the Otago Regional Plan: Coast (**RCP**). Consents are also held to dispose of dredged material at three offshore spoil grounds. These are, from north of the harbour entrance: South Spit also known as Shelly Beach, The Spit, and Heyward Point. The consent for disposal at the three existing sites expires in December 2011 and POL has indicated that it would apply for a new consent prior to 1 June 2011. Currently, the volume of spoil disposed at these three sites is less than what is authorised.

[49] POL engaged a number of experts whose reports covered all aspects of the project and we shall refer to this evidence in more detail when we come to consider the effects of the proposal in Section 6. While many of the outcomes were predictable, Mr Anderson emphasised that the proposed conditions of consent and the Environment Management Plan (**EMP**) are fundamental to the proposal. These provide a range of environmental limits and, within those, a series of trigger levels and management responses that would enable POL to adaptively manage

the effects of the proposal. Adoption of the EMP would ensure that any adverse environmental effects can be identified and mitigated before they became a problem.

[50] Mr Andersen told us that POL owns the land-based commercial infrastructure at Port Chalmers and Dunedin, although the latter was not relevant to the current applications. The company also had occupation rights to the CMA at and adjacent to its berths and commercial port undertakings. While the land space is adequate for the moment, the shortness of the Multi-purpose Wharf is a hindrance. This is also compounded by it joining the Container Wharf at an angle, thereby making it difficult to fully utilise the container cranes, which are on rails.

[51] However, what was largely driving the proposal were the indications from container shipping lines that the size of vessels would increase in future so as to achieve better economies of scale. Currently, the largest container vessels regularly servicing New Zealand are the, so called, 4100 TEU ships, which refers to the maximum number of "20 foot equivalent unit" (**TEU**) containers able to be carried. The next generation of ships are likely be 5000 to 6100 TEU vessels with the possibility of 8100 TEU vessels at some unspecified time in the future.

[52] A staged approach to channel widening and deepening is proposed. As we have already noted [21], dredging the channel, swinging basin and berths would involve the removal and disposal of 7.2 million cubic metres of material. This would be predominantly sand with small amounts of finer-grained material (silt and mud) and some broken rock. Mr Andersen stated that, despite careful investigation, no practical alternative to dumping at sea was identified. As the capacity of the existing spoil grounds are limited, a new disposal site would be required. Investigation had identified a suitable site, some 6.5 km northeast of the entrance to Otago Harbour, on a submergent spit trending northwards from Cape Saunders. Thus there would be disposal to four sites, although rock would be confined to the Heyward Point site.

[53] Dredging would be carried out at two levels of intensity.

- Dredging to maintain existing depths and carry out incremental deepening (**Incremental Capital Dredging**) would be done by POL's existing suction dredge "New Era" and/or a similar vessel, together with a barge-mounted backhoe or grab dredge mainly for use in the berth area. Incremental Capital Dredging would not exceed 1,450,000 cubic metres per year. Material for disposal would be divided between the existing spoil sites and the proposed new site A0.
- A major capital works programme (**Major Capital Dredging**) would remove the balance of the 7.2 million cubic metres of material. This work would be done on contract and would likely involve a considerably larger suction dredge although the size would be dependent on what is available when dredging is about to

> commence. The maximum practical size for a dredge in Otago Harbour is one with a capacity not exceeding 11,000 cubic metres. Such a dredge would have the potential to remove in the order of 1,000,000 cubic metres monthly and the effects of the proposal had been assessed on this basis. The resulting spoil would be dumped entirely at the A0 site. Because it is further offshore, the A0 site would not always be available to the smaller "New Era" dredge. The timing of the Major Capital Dredging would be subject to the demands of the shipping industry. During and after the capital dredging, ongoing maintenance dredging would continue.

[54] The proposed extension of the Multi-purpose Wharf by 135 metres would allow one large or two smaller container ships to be effectively worked or berthed at the same time, and while other vessels are in port. Berths at the company's two other wharves would remain unaltered.

[55] POL also propose to construct a fishing jetty off the proposed extension to the Multi-purpose Wharf. The 30 metre long fishing jetty is intended for recreational use and would be independent of the port. Public access would be provided via the existing walkway on the northeastern end of the Boiler Point reclamation, backing on to the container area adjacent to the Multi-purpose Wharf.

[56] Mr Andersen stated that POL acknowledges that Otago Harbour and the coastline are of considerable cultural and spiritual significance to tangata whenua. In recognising this, POL commissioned a cultural impact assessment report (**CIA**). Mr Andersen referred to productive consultation POL had had with local iwi and he gave an assurance that there would be ongoing collaborative engagement as the project progressed. He stated that POL had offered to form a Manawhenua Consultative Group to encourage dialogue and input on matters of interest to tangata whenua.

[57] Mr Andersen also referred to a number of benefits that would result from the proposal and we shall refer to these later in this decision when we come to discuss economic effects in Section 6. He also summarised the environmental effects, discussed the statutory framework, and referred to several points raised in the s.42A Report. Again, these are matters that we shall canvass later in this decision.

[58] In conclusion, Mr Andersen emphasised that the PNG proposal is essential if Port Otago is to remain available to international shipping lines, and this would ensure that the export of goods from the southern South Island was undertaken as efficiently as possible. This would be of considerable benefit to the wide range of businesses that are reliant on the port.

[59] After identifying and assessing the environmental effects, POL is confident that these can be appropriately managed and that the proposal would meet the criteria for sustainable management (in terms of the Act) and is consistent with the relevant objectives and policies of the NZ Coastal Policy Statement (NZCPS), the Otago Regional Policy Statement (**RPS**) and the Otago Regional Plan: Coast (**RCP**).

4.2 Summary of evidence presented on behalf of the applicant

[60] The following is a brief description of the evidence presented to us on behalf of the applicant, generally in the order in which it was heard. We do not attempt to cover everything that was said here as, where relevant, detailed evidence is included in our discussion of the principal issues and effects in Section 6.

[61] **Mr David Faulkner**, Chairman of the Board of Directors of Port Otago Limited since 2010, confirmed that the board had fully considered the need and implications of the PNG proposal. He said the project was vital in ensuring that New Zealand's exports, which are largely carried by sea, remain globally competitive. The board recognised that, to ensure this, investment in the necessary infrastructure is required. Mr Faulkner noted that the board takes its community responsibilities seriously, and one of its directors chairs the Port Environment Liaison Committee. The board regularly considers the minutes of that committee. He said the board would be closely monitoring the project to ensure that the predicted outcomes are achieved.

[62] **Mr Geoffrey Plunket** is the Chief Executive Officer of Port Otago Limited. He explained that POL is wholly owned by ORC and stated that he had been involved in the proposal since its inception. He said Port Otago is New Zealand's third largest port by cargo value. Mr Plunket then went on to provide an overview of the project, emphasising that the size of container vessels has steadily increased over the years as shipping companies strive for efficiency. While the company regularly handles 4100 TEU vessels, it wishes to have plans in place to ultimately handle 8100 vessels although it is anticipated intermediate sized vessels will be introduced before this. There is also a need to cater for the increasing size of cruise ships. To prepare for and accommodate these larger vessels, deepening of the harbour is critical.

[63] Mr Plunket provided us with a summary of the history of the port, including Dunedin, He said dredging began in the 1860s and that capital dredging has continued intermittently ever since along with ongoing maintenance dredging. This has culminated in the current 13 metre deep channel from Port Chalmers. Some 34 million cubic metres material has been dredged with about half of this being used for reclamation within the harbour, more particularly in the

Upper Harbour. The balance has been disposed at sea. With the improvements made to the harbour, trade through the port has correspondingly increased. Container traffic is expected to double from 220,000 per year to over twice this by 2030. Mr Plunket acknowledged that Otago Harbour is important environmentally, culturally, recreationally and economically, and that it supports a diverse number of users.

[64] **Mr Lincoln Coe** is General Manager Infrastructure for POL and has been involved with the project since its inception with responsibility for engaging the various experts and advisors who have designed and assessed the works for which consents are being sought. He said his approach had been very much multi-disciplinary in the sense that commercial, logistical, engineering, environmental and community considerations had been integrated to develop the proposal. Mr Coe discussed the drivers for the proposal and described the proposed works in some detail. He said the design process had been rigorous and robust, and followed international guidelines. In addition, the final design refinements and confirmation of the design process was undertaken with full mission ship simulation verification involving the Devonport Naval Facility.

[65] Mr Coe said POL had considered a range of possible alternatives to disposal at sea but had found that there is no commercial demand for the dredged material even though much of it is quartz-rich sand. Nor is the company aware of any proposals to reclaim land within the harbour for which the spoil could be used. There have, however, been proposals to use the finer-grained material to establish intertidal zones, largely by creating islands, in the upper harbour. Mr Coe pointed out that this would have to be thoroughly examined, and any reclamation, whatever its purpose, would need resource consent. Small volumes of dredged sand have been used in the past for beach renourishment at St Clair and St Kilda, on the south coast of the Otago Peninsula, but the volume to be disposed as part of this proposal would far exceed any amounts that can realistically be used for this purpose. POL, therefore, maintains that disposal at sea is the only viable option and this is a practice that has been ongoing for 150 years. Of its three existing offshore disposal sites, the preferred one is Heyward Point, which has the advantage of being in deeper water and, therefore, sea conditions for disposal are better in stormy conditions. This site is the only one where rock is dumped. The Spit site has been curtailed in recent years by POL due to shoaling. Dumping at the Shelley Beach (or South Spit) site has been primarily to compensate for erosion due to the interruption of long shore drift following construction of the mole.

[66] Mr Coe told us that, at locations within the harbour channel, namely Acheron Head and Rocky Point, a comparatively small volume of rock, estimated to be 25,000 cubic metres, is to be removed. This rock would require drilling and blasting to fracture and dislodge the material

before removal by a grab dredge. He said POL is familiar with this type of operation, having previously carried out rock removal at a number of locations within the harbour.

[67] In choosing a new disposal site, POL had identified a number of matters that needed to be taken into consideration including:

- avoiding areas of conservation interest, protected marine areas and areas of significant ecological value;
- avoiding significant effects on fishing and aquaculture;
- avoiding effects on recreation including sailing, surfing and boating;
- avoidance of shipping routes.
- considering effects of disposal on currents and waves;
- considering the likelihood of sediment being re-transported and causing effects on other areas such as beaches and estuaries;
- taking account of the distance from dredging work and consequential travelling costs; and
- siting for disposal in areas of similar natural material in order that re-colonisation of existing habitat will occur as quickly as possible following cessation of the disposal activity.

[68] From this exercise, two potential sites (referred to as A1 and A2) were initially identified. These were then modelled to determine such matters as the effects of plume dispersion on ecological communities, wave effects caused by a mound of disposed material on the seabed and sediment transport. Two separate peer reviews were undertaken of the modelling. The end result was the choosing of an intermediate site, A0, which more adequately met POL's selection criteria. The A0 site is some 6.5 km off the harbour entrance and, therefore, would not be available to the New Era under all sea conditions. All material from the Major Capital Dredging programme would be disposed at the A0 site except that it would not be used for the dumping of rock.

[69] Mr Coe then went on to explain the need to extend the Multi-purpose Wharf and he described the proposed design, which we have already discussed [*27 et seq*]. He emphasized that there were no practical alternatives if the projected trade and type of vessels using the port are as predicted, and he cited the following reasons:

- Cruise vessels cannot be safely berthed at the Multi-purpose Wharf because passengers and traffic associated with cruise ships cannot be accommodated safely when the container wharf is in use for vessel loading.

- Large container vessels cannot work at Beach St due to the lack of water depth alongside at the berth as well as there being no cranes available. The other reason is the significantly increased distance to take cargo from Beach St around to the main container stacking areas.
- Although, technically, logs could be worked at the Container and Multi-purpose wharves, it is not practical due to the long distance from the log storage area.
- The Container Wharf cannot be practically extended to the south by more than approximately 15m as a longer extension would impact on the incoming rail line to the port area, as well making access around to Beach St more difficult and congested. Such an extension would be of little value.

[70] Mr Coe went on to say that the proposed fishing jetty follows an undertaking to the community given by POL in 2007, and was in accordance with the Port Environment Plan. The proposed 30 m long jetty is solely to provide public access to the marine environment, including for recreational fishing. Access would only be denied for reasons of public safety such as danger from containers on the Multi-purpose Wharf blowing over in high winds or an ammonia leak, for example.

[71] Mr Coe also discussed maintaining the stability of the wharves as a consequence of the proposed dredging (berth deepening) removing toe support for the existing rock revetment. He acknowledged that this posed significant engineering risks.

[72] Mr Coe then went on to describe, in some detail, the investigative approach taken by POL. As a preliminary step, environmental evaluation of existing information, of which there is a considerable amount, was undertaken. Key issues and/or effects were identified, along with areas where further work was required. The preliminary evaluation was followed by a detailed project assessment that dealt with the biological/ecological environment, the physical environment, dredging design and, finally, general matters. In all, 22 reports were prepared and many involved extensive modelling. Much of the data that was obtained was subsequently presented to us at the hearing.

[73] Mr Coe also spoke of landside matters relating to improving efficiency on the wharves and container terminal, servicing the port by road and rail, navigation within the harbour, noise and visual impact of port activities. The latter two were of particular concern to a significant number of submitters and we shall refer to these matters later in our discussion of the effects of the proposal on amenity values.

[74] Mr Coe said POL has undertaken wide-ranging and extensive consultation, a draft AEE was circulated to the public, and a Project Consultative Group was established. Information obtained during the investigation into the project was also posted on the port company's website. Requests for hard copies of the reports were also met. Since the closing of submissions the company continues to meet with interested parties and has attempted to meet any concerns raised. Both, the proposed consent conditions, and the proposed EMP, require ongoing consultation, reporting of information and notification of works.

[75] POL has also consulted with tangata whenua interests throughout the investigation stage of the project. In response to a request from Rūnanga o Ōtākou and Kāti Huirapa Rūnanga ki Puketeraki, a CIA was prepared on behalf of POL by Kai Tahu Ki Otago (**KTKO**). Preparation of the CIA was a collaborative effort involving setting up the Manawhenua Working Group of six represented parties of Kai Tahu Whanui, along with KTKO and POL. The CIA contains 15 recommendations covering general, hydrodynamic, physical coastal environment, sedimentation and ecological matters. Other recommendations have been incorporated into the set of conditions and the EMP proposed by POL.

[76] Mr Coe said the EMP would be an evolving document, being expanded as the project progressed, and would be submitted to the consent authority prior to the commencement of any works under the proposed consents. It would aim to establish measures to avoid, remedy or mitigate any adverse environmental effects. POL would, thus, be taking an adaptive management approach that would identify and act on matters of concern. The EMP would describe the monitoring regime and the actions to be taken when effects are approaching an environmental upper limit.

[77] **Mr Maurice Davis** is a marine and coastal engineer employed by CPG New Zealand Ltd. Mr Davis was chief engineer of the Otago Harbour Board (now POL) for nearly 20 years and has over 57 years experience in the port industry. He has a Bachelor of Engineering (Civil) (NZ) degree and, among other things is a Chartered Professional Engineer. Mr Davis referred to his report, titled *Short History of Otago Harbour Development and Dredging*, which is summarised in the Assessment of Environmental Effects (**AEE**). He spoke at some length on the development of Otago Harbour and, particularly, the history of dredging. When the first Europeans arrived, the harbour was a shallow tidal inlet with extensive sandbanks exposed at low tide and a sand bar offshore. A sheltered anchorage with a depth of approximately 6 metres, existed a short distance within the harbour at what is now known as Harington Bend. In 1868, dredging of a channel commenced from Port Chalmers to Dunedin and, since then, the harbour has been progressively deepened along with works to improve the outer bar.

Construction of the Mole at Aramoana commenced in 1884, and other training walls have also been constructed in the harbour to direct tidal flows into defined channels.

[78] Mr Davis told us that, up to the present day, some 34 million cubic metres of material has been dredged from the harbour. Most of this is sand but also included some finer-grained material, more particularly from the inner or upper harbour, and a small amount of rock. Mr Davis deduced that almost half of the dredged material had been used in reclamations. This was partly because it was the easiest way to dispose of material, coupled with a demand for flat land adjacent to Dunedin. However, there has been a progressive increase in the amount of spoil dumped at sea. The effects of the changes to the harbour due to dredging, in relation to the ability for tidal outflows to maintain the harbour entrance, has been recognised by POL and its predecessors.

[79] **Mr Stuart Jennings** is Country Operations Manager for Maersk Line in New Zealand. He said, currently, Maersk calls at nine ports in New Zealand but the majority of cargo moves to/from the two main ports of Auckland and Port Chalmers. Auckland is dominated by import containers whereas Port Chalmers is predominately used for export. The latter includes a large volume of high value refrigerated cargo. Maersk vessels connect with world mainline services through Singapore and Tanjung Pelepas in Malaysia. Mr Jennings noted that shipowners face significant increasing costs, particularly fuel, which can be exacerbated if vessels are delayed and have to steam faster thereby burning more oil. He said one way costs can be reduced is for Port Chalmers to be able to handle ships larger than the current 4100 TEU vessels. He considered that 5000-6000 TEU vessels, requiring a draft of 13.5-14.0 metres, would be the next logical step but he did not think New Zealand would ever see the largest vessels of 12,000 TEU.

[80] **Dr Herbert Harris** appeared on behalf of the Otago Chamber of Commerce [**OCOC**]. He is a consultant and Chairman of the Logistics Committee and was accompanied by Mr Mark Willis, who is Chairman of the Otago Chamber of Commerce International Traders committee. Mr Harris gave evidence on the importance of the port to the economic well-being of Otago and endorsed the evidence that had been presented by others at the hearing. He told us that OCOC represents approximately 1,400 businesses, with some 25,000 employees, and one of its aims is to retain businesses in Otago as well as attracting new ones. He was of the opinion that the extensive hinterland had potential to generate even more export cargo but this was dependent on a well-developed infrastructure, including the port. He did not consider the port's location in the south of New Zealand as being detrimental in getting exports to market.

[81] **Mr Geoffrey Butcher** is a director of Christchurch-based Butcher Partners Ltd., an economic consulting company. He obtained an MA (Hons) degree in Economics from Canterbury University in 1978 and has 30 years of experience as an economist. In his evidence, Mr Butcher advised that he had excluded any costs and benefits associated with the environmental impacts of the projects and, likewise, the strategic benefits of retaining a major export port in the South Island. Rather, he focused on the economic value of enabling larger vessels to call at Port Chalmers and the economic impact of the proposal in terms of employment and income. Like Mr Harris, Mr Butcher emphasised the strategic advantages of having more than one major export port in New Zealand, particularly if one of these was in the South Island. We shall refer again to Mr Butcher's evidence when we come to consider the effects of the proposal on the economy in Section 6 of this decision.

[82] **Mr Keith Ballagh** is a partner in Marshall Day Acoustics and has worked with POL for over 15 years in relation to noise management at Port Chalmers. He holds a Bachelor of Mechanical Engineering (Hons) degree from Canterbury University (1975). Mr Ballagh told us he had been engaged by POL to investigate the effects of noise likely to be generated from the proposal to dredge the shipping channel to accommodate larger container vessels. Mr Ballagh had prepared a report titled *Assessment of Noise Effects from Project Next Generation – Dredging and Operation* in October of 2009, and this formed the basis of his evidence. In his evidence he described, among other things, the noise sources, applicable noise rules, and an assessment of the effects from construction and operation. He also discussed the management of noise and mitigation options. Mr Ballagh's evidence was substantial and we shall refer to it later in more detail in our discussion of noise, under the general topic of amenity values in Section 6.

[83] **Professor Keith Probert** is an Associate Professor in the Department of Marine Science, Otago University and holds a BSc (Hons) degree in zoology and a PhD in marine biology, both from the University of London. He has worked in the area of marine environmental studies since 1973 and has an extensive list of publications. Professor Probert's evidence, on behalf of POL, considered the existing state of knowledge on the benthic habitats and communities in Otago Harbour and the studies undertaken, as part of the proposal, to supplement this knowledge and provide a more comprehensive and detailed picture of the benthic ecology of the harbour. He also considered the adequacy of this information for assessing marine environmental effects as a basis for possible monitoring work. Other witnesses have assessed the potential impact of the proposal on the benthic ecology of Otago Harbour, the physical features of the environment and birdlife, mammals and fish. We shall

refer again to Professor Probert's evidence when we consider the effects of the proposal later in Section 6.

[84] **Dr Robert Bell** is Principal Scientist – Coasts and Hazards with NIWA, where he has been employed for the past 18 years. He holds the degrees of BE(Hons) and a PhD in Civil Engineering from the University of Canterbury. Dr Bell said he was engaged by POL to assess the hydrodynamic and physical suspended-sediment effects of the proposal. This assessment was based on using a moderate-sized TSHD for Major Capital Dredging and the "New Era" (or similar) dredge for Incremental Capital Dredging. The assessment was done using existing records of current flows and modelling and was in two parts: effects within the harbour and the effects of the offshore disposal of the dredgings. Dr Bell's evidence discussed the effects of the dredging on tides and currents in Otago Harbour and dispersal of sediments, both within the harbour and offshore from disposal at the A0 site. He also considered the effects of the disposal at A0 on wave heights, advised on monitoring conditions related to sediment plumes and hydrodynamic effects, as well as specific issues raised by submitters and in the s.42A Report.

[85] **Mr Nigel Jones** is General Manager Strategy, Fonterra Trade and Operations. He holds a Masters degree in Supply Chain and Logistics from Canfield University (UK) and Bachelor degrees in Accountancy and Business Finance. He also holds qualifications in Nautical Science and has a foreign-going deck officer certificate of competence from the British Department of Trade. Mr Jones spoke to us about the challenges facing New Zealand's export sector. He emphasised the need to ensure that the landed cost of goods at their destination is minimised as much as possible so that New Zealand exports remain competitive. He said shipping can be made more economic by using larger vessels and, as a consequence, Fonterra supports proposal.

[86] **Dr Martin Single** is a Director and Principal Consultant for Shore Processes and Management Ltd. He holds a PhD in Geography (coastal processes and geomorphological change) and also has a position as a Senior Fellow in the Geography Department, University of Canterbury. Dr Single presented evidence on the effects of the proposal on the physical coastal environment. He described the harbour bed sediment structure and materials expected to be encountered during dredging. He also discussed the effects of wake from vessels using the deeper channel, and the effects of the proposal on the beaches and shoreline of the harbour and Blueskin Bay.

[87] **Dr Christopher Hickey** is a Principal scientist with NIWA and is also a Director of NIWA USA (Inc). He has a PhD in biochemistry/microbiology from the University of Waikato and has worked for 30 years in environmental research and consulting in the area of

contaminant impacts in fresh and marine waters. Dr Hickey's specialist areas are in water quality guidelines and environmental toxicology. He provided evidence on chemical contaminants and the potential for toxicity-related adverse effects in relation to the proposed dredging and disposal of material from the Lower Harbour. This included an ecotoxicological review to identify contaminants of concern and an assessment of the biological and human health effects of the proposal.

[88] **Dr Mark James** is an aquatic ecologist holding BSc and BSc(Hons) degrees from Victoria University, Wellington, and a PhD (Aquatic Biology) from the University of Otago, Dunedin. Following a long career with NIWA including Director of Operations from 2002-2008, he set up as a private environmental consultant and ecotour operator. In his evidence on the effects of the proposed dredging and disposal, Dr James provided a description of the aquatic ecology of the area of the proposed disposal site A0 and the wider receiving environment with a focus on benthic ecology and plankton ecology, and an assessment of the potential effects of the proposed dredging and disposal on the ecology of the aquatic communities in the Lower Harbour and offshore in Blueskin Bay.

[89] **Mr Martin Cawthorn** has a BSc degree in zoology. He has had some 45 years experience as a specialist in marine mammal research (whales and seals). After an extensive career working in the field with various government departments, both in New Zealand as well as Canada, he established Cawthorn & Associates, specialising in marine mammals and fisheries, and marine industrial interactions in 1992. Mr Cawthorn provided evidence regarding the potential effects of the proposed dredging programme on marine mammals resident on, and in the vicinity of, Taiaroa Head at the entrance to Otago Harbour.

[90] **Mr Richard Boyd** is a Director and Principal Consultant of Boyd Fisheries Consultants Limited. He has some 40 years experience in fisheries science, research and related management issues. Mr Boyd provided evidence on the fisheries related issues associated with the proposal. In doing so, he considered the fisheries environment and habitats, and the fish and shellfish fauna of Otago Harbour and coastal Otago. He also discussed the recreational, commercial and customary utilisation of the fish and shellfish resources of the area, along with areas of importance for fish spawning and juvenile fish, and the habitats and diet of fish.

[91] The evidence of **Mr Paul Sagar** was presented to us as an affidavit as he was absent on a Sub-Antarctic Island. We have read Mr Sagar's affidavit. He offered to answer any questions (by email) we might have but, in the event, there were none. Mr Sagar has a BSc degree in botany and zoology, and an MSc in zoology, both from the University of Canterbury. He

provided evidence, in his affidavit, on the effects of the proposal on existing seabird and shorebird communities of Otago Harbour, Taiaroa Head, and the nearshore area.

[92] **Dr Philip Mitchell** is a planner and is a Director of Mitchell Partnerships Limited, Auckland. He holds the degrees of BE(Hons) and PhD, both from the University of Canterbury. and has practised in resource management for the past 27 years. In his evidence, Dr Mitchell addressed environmental and resource management issues within the framework of the Act as it applies to this application. In doing so, he described the activity status of the application and assessed it against a range of relevant statutory tests. Dr Mitchell also discussed the submissions and matters raised by the council officers in the s.42A Report. We shall refer to Dr Mitchell's evidence later when we come to discuss planning matters.

4.3 Submissions and evidence on behalf of submitters

[93] In the summary of the submissions that follow we have sorted these into broad categories. Those who appeared at the hearing are listed in bold type. We have also provided the submitter number in brackets. In some cases, where material evidence has been presented to us, we shall refer to this in our discussion of the principal issues and effects in Section 6.

[94] We shall first deal with submissions generally in support of the proposal.

Local Government

[95] **Mr Paul Freeland**, a senior planner with Dunedin City Council (**DCC**), gave evidence on behalf of the council (No 148). He said DCC supported the application because of the economic importance of the port to Dunedin. Subject to a consequential change to the District Plan to adjust the Outer Noise Control Boundary, as identified in Mr Ballagh's plan showing the modelled 55dBA L_{dn} noise contour, and a change to the definition of a Noise Affected Property to include rural-zoned properties, Mr Freeland considered POL had supplied sufficient information and had provided for appropriate management of the effects of the proposal. He did, however, seek a commitment from POL to initiate or proactively participate in the necessary change to the District Plan to ensure that any additional properties that come within the outer noise control boundaries are managed in a manner consistent with the existing noise control regime at Port Chalmers. DCC sought no additional conditions of consent with respect to the effects of wave action on DCC property along the coast that could potentially arise from the use of the port by larger vessels.

[96] The Otago Peninsula Community Board (No 109), in its written submission, supported the applications but wanted the dredging managed to ensure there was minimum suspended

sediment discharged in the harbour, and that the disposal of spoil would be rigorously managed.

Commerce

[97] **Mr David Humphrey** (No 90), a Dunedin coffee merchant, in speaking to his submission outlined his intimate knowledge of the Otago coastal waters having been captain of a naval reserve vessel based in the harbour. He emphasised the economic benefits of the proposal, which he described as enormous. He felt that these far outweigh any impact on the environment. He is of the view is that, if you live near or close to a port, you must expect noise. As for the road (SH88) from Dunedin to Port Chalmers, he considered this was adequate for the traffic using it but it did need policing.

[98] The Otago Chamber of Commerce (No 103) considers the proposal is necessary for the well-being of Dunedin and southern New Zealand. A similar position was taken by the Otago Southland Employers Association (No 104) and local officials of the transport unions: Mr P. Adams, Maritime Union of New Zealand, and Ms R Blakeley, Rail and Maritime Transport Union (No 120).

Community Groups

[99] **Mr Graeme Burns** presented the submission on behalf of the **Harington Point Community Society** (No 114), which represents over 40 households at the northern end of Te Rauone Beach. Initial concerns about the effects of the proposal on the shoreline, tidal movements, recreational fishing and wildlife were allayed after about 10 meetings organised by POL as part of the Project Consultation Group. While there would be some relatively minor effects, the society was of the opinion that they would only be temporary. Mr Burns stated that erosion started at Te Rauone Beach in 1946 after the tip of the Mole was washed away and scouring moved eastwards into the harbour. Overall, Mr Burns advised that the society felt that the project has been thoroughly investigated, openly discussed, and is an essential positive step for the future.

Tourism

[100] **Mr John Milburn** of Monarch Wildlife Cruises Ltd (No 107) explained the services his company provides on Otago Peninsula and, in particular, the sea cruises on Otago Harbour. He said the majority of his concerns had been met through the work done for the AEE. Specifically, these were the effects of the dredging on tidal ranges and currents in the harbour, sedimentation in peripheral areas of the harbour, and effects on the environment and ecosystems in the harbour, its entrance and Blueskin Bay. His considers that POL, and its

predecessor the Otago Harbour Board, have a good history of protecting key environmental values during previous dredging. He expressed the need to improve all tide access to the harbour.

[101] Mr P. M. Reid (No 20), owner and director of Natures Wonders at the tip of the Otago Peninsula, in a written submission, said he was reassured by the scientific evidence in the application and was of the opinion that the proposed conditions would be sufficient to ensure the well-being of the harbour was not compromised by the proposal.

[102] Tourism NZ (No 47) and Tourism Dunedin (No 177) both supported the application as it would separate cruise vessels from the cargo-working parts of the port. Also in support was Cruise New Zealand Inc (No 116).

Industry and shipping

[103] **Mr John Neilson** (No 101) of Dunedin has experience of the dredging industry and he supported having the harbour deepened. He also referred to his MSc thesis dealing with the structure and composition of sediments in the upper (<1m) layer of sediments in Otago Harbour. This research showed that the sediments sampled in the Lower Harbour were generally very clean, medium to coarse sand. He also said that the receiving waters are not clear but carry naturally suspended sediment.

[104] **Mr Alan Middleton** (No 97) has worked at Port Chalmers for 30 years and he emphasised his view that New Zealand needs ports, and that carrying cargo by ship is the most efficient form of long distance transport. He said a lack of good port and shipping services would have adverse economic consequences and he supports the proposal. He stated that the shipping line Maersk has, at times, had to leave cargo behind as it did not have enough capacity on its present vessels.

[105] The Alliance Group Ltd (No 3) and Silver Fern Farms Ltd (No 136), both meat processing companies with works in Otago and Southland, and City Forests Limited (No 4), a company that owns forests and a processing plant in Otago, all export through Port Chalmers and all endorsed the proposal.

[106] Shipping lines Hamburg Sud (No 123), Maersk Line New Zealand (No 43) and ISS-McKay Limited (No 190) also made supportive submissions. However, Maersk through Mr Jennings had already appeared as a witness on behalf of the applicant.

[107] Mr I. J. Farquhar (No 95), who had been formerly involved with the governance of the port, emphasised in his written submission the trend to larger vessels. Mr R. F. De Lautour (No

31) who is a former general manager of the Otago Harbour Board, summarised how the port had successfully dealt with the progressive increase in the size of vessels.

[108] The Otago Yacht Club Inc (No 139) and the Macandrew Bay Boating Club Inc (No 145) were also in support, although the latter sought conditions to ensure that there was no increase in sedimentation in Otago Harbour.

Fishing

[109] The Otago Rock Lobster Industry Association (No 126) support was conditional on ensuring that any silt dumped at the A0 site did not find its way inshore, particularly to the *Macrocystis* beds.

Surfing

[110] While Surfing Taranaki (No 142) supported the proposal, this was conditional on strict independent monitoring, particularly in ensuring that the dumping of spoil has no adverse effects on surf breaks.

Individuals

[111] **Mr John Grainger** (No 138) lives at Andersons Bay and has a farm on Otago Peninsula. He told the hearing that it was essential for the applications to be granted.

[112] In addition, written submissions in support of the application were received from Messrs W. G. Lloyd (No 48), Ms P. J. Conway (No 49), two Port Chalmers residents and Messrs R. H. Dunn (No 15), A. R. Richardson (50), P. J. Sutherland (No 53), M. C. Parry (No 54), and L Kellas (Portobello) (No 196).

[113] There were several submissions that can best be described as neutral.

[114] Speaking on behalf of the **Aramoana League (Inc)** (No 57), Messrs **William Brown** and **Donald Gibbs** sought that, if the consents were granted, a management plan with prior monitoring be put in place to ensure that silting caused by dredging does not impinge on the Aramoana salt marsh, strategies are in put place to mitigate any erosion at Te Ngaru (to the west of the salt marsh) and that possible detrimental effects on beaches, including those used for surfing, are avoided. The league was also concerned about the future of Shelley Beach as well as the Long Mac groyne and the nearby Spit Wharf or Pilot Jetty, both of which are deteriorating.

[115] **Professor Sir Alan Mark** (No 93), in expanding on his written submission, stressed that the Aramoana salt marsh is extremely vulnerable to mismanagement, particularly siltation.

This area was also, along with several other areas in and around Otago Harbour, an important earner of ecotourism revenue. He accepts that deepening of the channel is a necessary part of POL's forward planning but what is consequently important is minimising associated adverse environmental impacts. He highlighted the importance of environmental monitoring with specified thresholds for dredging, siltation, impact on bird life and other such matters. He noted that POL had indicated that concerns he had raised previously would be addressed in the proposed EMP.

Fishing

[116] **Joan Fishing Company Limited** (No 119). This submission was addressed by **Mr Neil McDonald** accompanied by his wife **Ms Michelle Taiaroa**. Mr McDonald is skipper of the "F.V. Triton" and he has been fishing for 32 years working predominantly as a day fisherman out of Port Chalmers and Otakou with a focus on the fresh fish market. He stated that in the early years there were as many as 26 boats working out of Otago Harbour and the majority of these boats made a living in and around the A0 site. He claimed that, as fishing patterns are very temperamental, scientists know very little of this whereas, from long practical experience, he has been able to predict where fish will be at different times of the year. He strongly disputed that dumping at A0 would cause only a minor inconvenience and gave evidence of the types of fish present. He also stated that he had witnessed the shallowing of the seabed at the existing Heyward Point disposal site and, under certain conditions, this cannot now be fished. He said his company also has no information on whether or not the dredging of the shipping channel would detrimentally affect access to the Otakou Wharf, which his company owns. He seeks continuous monitoring of the A0 site and financial compensation for any losses his company may incur as a result of the proposal going ahead.

[117] The Ministry of Fisheries (Dunedin) (No 124) neither supports nor opposes the application and, while they indicated a wish to be heard, they did not in fact do so. Given the importance of fishing in the area, and the amount of interest and concerns of submitters with an interest in fishing, we think this is a pity. The ministry would like the time table for completing the project to be resolved by POL after taking into consideration the likely impacts upon different habitats, such as the cockle beds and eelgrass areas. The ministry is of the opinion that there are technological solutions to reducing the impact of suspended sediments. Of greatest concern was the dredging of the swinging basin down to a depth where a TSHD, which can decant discharge water to depth, can then operate. The ministry also sought that the design and implementation of the proposed monitoring be peer reviewed. The ministry also sought the option to have a role in the review process. In its submission, the ministry said it regarded the cockle harvesting, under a special permit, as a commercial operation.

Surfing

[118] The submission from **The Surf Break Protection Society** (No 157) was prepared by Ms Nicola Reeves. The principal concern of the society was the effect sediment disposal at A0 may have on the surf breaks. The society, in its submission, requested that the consenting authority recognises the national and international significance of the surfing waves between Aramoana and Karitane. At the hearing, a statement prepared by Ms Reeves was read to us by **Mr J Hutching** her absence. This described the three surf breaks in the area and acknowledged that one, at Aramoana, had actually improved. However, more information was needed on the outcomes from disposal at sea and, as the largest vessels were not anticipated for some time, this gave ample time for collecting more data such as on-going bathymetric information.

[119] Messrs R. D. Hemi (No 62) and Richard Egan (No 143), while not opposed to the applications, sought conditions on the consents to protect the surfing beaches north of the harbour entrance. As well as the prospect of dumping detrimentally altering the breaks, they were concerned about the clarity of the water and, also, that it may contain contaminants that could affect the health of surfers.

Coastal settlements

[120] **Ms Margaret Marsich** (No 149) is a resident at the north end of Warrington. She explained how, over the past 30 years, she had seen the nearby coast change from a boulder to a sand beach although she did not necessarily attribute this to the port company's activities. She was concerned that, while the modelling undertaken for POL showed there would be no significant transport of sediment onto the coast from the disposal of spoil offshore, currents, tides and unusual storm events could cause unpredicted results. There were, in her view, no guarantees. Ms Marsich maintained that further data collection is needed before any consents can be granted. In referring to the AEE, she noted that many statements could not be relied on because they were qualified by using words such as "unlikely" and "should not". She advocated close monitoring of the project and that this should involve people living locally rather than just recognised researchers. Locals could also be used to gather data. Monitoring results should be readily available and widely distributed.

[121] Mr Nathan Parker (No 159), also of Warrington had, in his written submission, similar comments about the changes at the beach and expressed concern about sediment disposal altering the marine environment.

[122] Mr William Brown (No 77), of Aramoana Road, sought independent monitoring of the cockle beds, and that the Long Mac Wall and Pilot Jetty near the harbour entrance be repaired. He also had concerns as to the impact that dumping a large amount of spoil at the A0 site would

have on the commercial fishery. We note that Mr Brown appeared before us on behalf of the Aramoana League Inc.

[123] Ms M. McFarlane (No 67), of Port Chalmers, was not opposed to the applications provided the noise that would emanate from the extension of the Multi-purpose Wharf did not have a major effect on residents of Careys Bay. Ms McFarlane sought more research on this. She also felt that the fishing jetty at Careys Bay could be made readily accessible to all, including those in wheelchairs.

[124] Finally we turn to those submissions that were generally in opposition.

Maori perspective

[125] **Kāti Huirapa Rūnaka ki Puketeraki** (No 1), in its written submission, opposed the application as the dredging and the disposal of the spoil offshore would be intrusive into the cultural, spiritual, historic and traditional relationship of Kai Tahu Whanui with Otago Harbour and Te Tai O Arai Te Uru or Otago Coastal Marine Area. If consents were to be granted then a condition was sought that a monitoring programme in partnership with Manawhenua be implemented so as to avoid, remedy or mitigate any adverse effects on key species and ecosystems of importance to Kai Tahu. This would include adverse effects from suspended sediments. Several people appeared on behalf of Kāti Huirapa Rūnaka ki Puketeraki and we refer to them below.

[126] **Te Rūnanga o Ōtākou (Inc)** (No 5), in its written submission, provided a summary of its cultural relationship with Otago Harbour, and the relevant statutory framework within which it operates. Its position was that POL should undertake comprehensive monitoring before, during and after dredging. During the hearing the venue changed from Dunedin to Tamatea on the Ōtākou Marae in order to hear a number of the iwi submissions. The first submitter on the marae, on behalf Te Rūnanga o Ōtākou, was **Mr Tahu Potiki.** After providing background information he gave an informative review of Kai Tahu, Kati Mamoe and Waitaha traditions and history, which placed Otago Peninsula firmly in context. He explained that Kai Tahu has a historical association with the harbour that no other people can share. It is ancient, mythological, traditional, historical and spiritual. Mr Potiki then described the great changes that had taken place from about 1830. The last lot of dredging, he said, had caused siltation and a decline in the flounder fishery. He was of the view that there should be no further degradation of the human and natural systems of Otago Harbour, and that the PNG proposal must, instead, enhance these systems. Mr Potiki expressed a lack of confidence in the scientific predictions submitted with the application.

[127] **Mr Tamatea Smith** spoke on behalf of Kāti Huirapa Rūnaka ki Puketeraki and as a member of its executive. He described his family's past reliance on marine resources for food, and the subsequent decline in species populations. The establishment of the East Otago Taiāpure has helped prevent overfishing. He went on to explain that his marae is renowned for providing visitors with tuaki (cockles) from the harbour, and is keen to see this manaakitanga tradition preserved. The proposal would need to ensure that it does not hinder the optimum growing conditions for the remaining kaimoana as a result of sand build up on the coast around Puketeraki, Karitane and Waikouaiti, as well as the potential for degradation resulting from coastal sand drift.

[128] **Ms Aroha Ellison**, a member of Kāti Huirapa Rūnaka ki Puketeraki, explained her kinship with the marae and her role as catering officer. She advised that she prepares a large number of meals using local kaimoana. She is worried the effect the proposal could have on this resource.

[129] **Mr Hinerangi Heath** also spoke on behalf of Kāti Huirapa Rūnaka ki Puketeraki. He outlined his enjoyment of the coastal inlets and bays, and the steps that were being implemented to encourage the involvement of young people in paddling (waka amo), a means of travel that had almost disappeared. Any build-up of sediment in the coastal environment could impact on this traditional recreational activity.

[130] **Mr Matapura Ellison**, chairperson of Kāti Huirapa Rūnaka ki Puketeraki, greeted the hearing committee and those present, and then went on to explain mahika kai of the freshwater and of the sea. The principles or tikanga in regard to mahika kai was that everything is connected by whakapapa and that everyone must respect the various kai, taking only enough for immediate needs. He then dwelt on the importance of karengo (*Macrocytis*), and the species harvested for food that depend on it. He said mahika kai and kaimoana assets are of immeasurable value in terms of providing manaaki to guests, both at home and at the marae. Mr Ellison emphasised that is unthinkable for this food resource to be put at risk from sedimentation arising from disposal at the A0 site. While concerned about the potential detrimental aspects of the proposal, he stated that Kāti Huirapa Rūnaka ki Puketeraki has a strong relationship with POL.

[131] **Mr Hoani Langsbury** and **Ms Kuao Langsbury** are Rūnaka Members of Te Rūnanga o Ōtākou. Mr Langsbury, Rūnaka Manager, has a BSc from Victoria University and is a former chair of the Otago Conservation Board. He told the panel of the independent research and monitoring that he is doing into the health of Otago Harbour so that resources are protected for present and future generations, and that mahika kai remains the cornerstone of Kai Tahu

culture. Various industries and activities within Otago Harbour, including dredging, have over many years impacted on Kai Tahu's association and use of these resources. Therefore, appropriate conditions are sought to ensure that the PNG proposal is appropriately monitored, if consent is granted. In this respect Mr Langsbury requested that a working party be established for the duration of the consent to review monitoring with appropriate remediation or mitigation. In addition, the potential risk to the sandbanks in the harbour from long term scouring also needs to be addressed.

[132] Mr Riki Harris and Ms Eleanor Russell were unable to be present and a statement of their evidence on behalf of Te Rūnanga o Ōtākou was read by Mr Langsbury. Mr Harris is a commercial fisherman and Ms Russell is on Mataitai, Coastal Care and Ōtākou Marae Whānau committees. They were concerned that the proposal could induce erosion on both sides of Otago Harbour and drew our attention to the dramatic changes that are currently taking place at Te Rauone Beach and the backwash effects from vessels on certain tides. The effects on the tuaki beds and other shellfish were also of concern. In considering the applications, they emphasised there is a need for a precautionary approach and that POL should be transparent all the way through the proposal.

[133] **Mr Toni Evans**, of Te Rūnanga o Ōtākou, expressed concern that, in a few generations, there will be no kaimoana in the harbour. He believed the proposed dredging would make the cockle beds smaller.

[134] **Mr Paul Karaitiana**, of Te Rūnanga o Ōtākou, has noted a change on Te Rauone Beach from solid sand to a mix of mud and sand in the low tide area, with erosion of sand in the north and accretion at the south end of the beach. Other concerns include the effect dredging would have on the channel, especially at Harington Bend, the impact on kaimoana, particularly tuaki beds, incremental widening of the sides of the channel, and the risk of introduction of alien weeds from the hulls of vessels. His support for the proposal is conditional POL exercising the utmost care to protect the ecological balance of Te Rauone and the harbour, and to provide for the sustainability of its kaimoana, including the tuaki beds. In addition, he seeks to have his whanau having direct manawhenua, mana moana involvement in monitoring the effects of the project.

[135] **Ms Moana Wesley** also spoke to us on behalf of Te Rūnanga o Ōtākou. She expressed concern at aspects of the proposal following direct observation of changes that have occurred at Te Rauone as vessels have grown in numbers and size, and the risk to kaimoana. She also stressed the need to take into account the cumulative effects that may arise from seemingly small, but incremental, changes.

[136] Mr Tangi Russell was not available to appear before us but a statement of his evidence, on behalf of Te Rūnanga o Ōtākou, was read by Mr Hoani Langsbury. In his statement Mr Russell raised the issue of dredging, its effects on the tuaki and other shellfish environments, lack of any initiatives on destabilisation of shellfish beds and sand banks, and the dumping of spoil in Blueskin Bay. During past dredging he had noticed a decline in the flounder fishery and that some tuaki beds disappeared. He asked that the hearing committee err on the side of caution and ensure the project is appropriately, and transparently, monitored.

[137] **Mr Tamati Langsbury**, a dive and surf instructor, gave evidence on behalf of himself and Te Rūnanga o Ōtākou. He was concerned about potential loss of habitats for shellfish and other marine life, and the effects on recreational opportunities such as surfing, various types of fishing and collecting shellfish. He said some fishing holes, such as those fished for groper, had been lost and a similar fate could await known cod holes. Scouring and the introduction of contaminants could also arise from the proposed dredging. Dumping in the past has affected the fishing at Goat Island by modifying a reef although the surf break was not detrimentally affected. Monitoring of shell beds is needed. He considered disposal of spoil should be 21 km offshore where the water is deeper.

[138] **Mr Tim Vial** is an experienced planner and is employed by KTKO Limited as a resource management planner. He holds BA and LLB degrees from Victoria University and a Master of Regional and Resource Planning from the University of Otago. Mr Vial was engaged by Kāti Huirapa Rūnaka ki Puketeraki and Te Rūnanga o Ōtākou to provide resource management advice on the PNG proposal. Mr Vial provided helpful advice on the relevant sections in the various statutory documents including the Act, the RPS, the RCP and the NZCPS, with emphasis on Tikanga Māori. He then referred us to Dr Mitchell's evidence on behalf of POL where it stated that a condition is proposed for Kai Tahu involvement in a Manawhenua Consultation Group. He understands that this is supported by the Papatipu Rūnanga. In conclusion, it was Mr Vial's opinion that the granting of the consents should be subject to appropriate conditions that provide for the cultural, spiritual and environmental outcomes sought by Kāti Huirapa Rūnaka ki Puketeraki and Te Rūnanga o Ōtākou within the harbour and the adjacent marine area. These include ensuring Kai Tahu whānau are able to undertake their customary practices, that an abundant supply of mahika kai resources are available now and in the future, and that further degradation of the mauri and wairua of these waters is avoided.

[139] **Mr Edward Ellison** is Chairman of Te Rūnanga o Ōtākou. He is a former member of the Otago Conservation Board, the NZ Conservation Authority and is, currently, chair of KTKO Ltd. Mr Ellison has extensive experience in representing Te Rūnanga o Ōtākou in

resource management matters. Initially, he spoke of his whakapapa and the duties attached to kaitiakitanga. He also referred us to Chapter 8 of the 2005 Kāi Tahu Natural Resources Management plan, which relates to Otago Harbour and which he considered was relevant to this proposal. Following a historical summary, he stated that his people have, either unwittingly, unwillingly or willingly, sacrificed much, including through the development of Otago Harbour as a port. The works proposed as part of the proposal raise the concern for his people as to the cumulative effects and whether or not a tipping point for the Lower Harbour is now a potential risk. Like previous witnesses, Mr Ellison outlined the changes that have occurred along the shoreline of the Lower Harbour. He was not in favour of further reclamation in Otago Harbour and referred us to a 1991 study in which Maori elders lamented the decline of its fishery. From a cultural and environmental perspective he would prefer the project to not proceed, and hence a precautionary approach to the applications has been taken. Uncertainty over the implementation of the proposed adaptive management regime remains a concern to him. If the consents are granted then Te Rūnanga o Ōtākou seek appropriate mitigation and a proper relationship with POL.

[140] Mr Brendan Flack (No 183) is a Tiaki for Kāti Huirapa Rūnaka ki Puketeraki and made a submission on his own behalf. Mr Flack was not able to be present at the hearing but his wife, **Ms Susie Flack** presented a statement on his behalf. In his submission he said the deposition of sediment has the ability to degrade the mauri of Tangaroa by making reef systems uninhabitable. His submission emphasised that there should be no dumping at sea with its fragile reef system. He also said the cockle beds are a quota managed species and that POL does not appear to have taken this into account. He sought that the consent applications for dredging be declined.

Fishing

[141] A group of submitters comprising **Port Chalmers Fisherman's Cooperative Society** (No 2), **Paua Industry Council Ltd** and **Kina Industry Council** (No 198), **PauaMac5 Inc** (No 171), **NZ Federation of Commercial Fishermen** and **Port Otago Fisherman's Cooperative** (No 194), and **Otago Rock Lobster Industry Association** (No 126) were represented at the hearing by **Mr Nigel Bryce**, who is an Associate Director of Ryder Consulting Ltd and is an experienced environmental planner.

[142] Mr Bryce stated that the group shared concerns about dumping disrupting trawling and fine sediments having a detrimental impact on paua, kina and lobster. While he recognised that the PNG proposal would have significant economic benefits, this in itself was not sufficient reason to grant the consents sought. He said consents should only be granted when it is clear

that adverse effects can be avoided, remedied or mitigated. He did, however, acknowledge, when analysing the Act and NZCPS that the present maintenance dredging in Otago Harbour forms part of the permitted baseline.

[143] The first witness called by Mr Bryce was **Mr Steve Little** representing the Port Chalmers Fisherman's Cooperative Society. Mr Little has been a commercial fisherman for 30 years. He explained the intricacies involved in fishing in Blueskin Bay, a multi-species fishery, under current fisheries regulations. He was of the opinion, supported by his observations of the existing spoil sites, that dumping at A0 would, directly or indirectly, destroy habitat of importance to the fishing industry. As well as the trawl fishery, the A0 site is a source of bait for cray-fishing boats during the winter. He also thought that fine sediments from the site would be transported by the Blueskin Bay gyre into the bay. Fine sediments, such as at the existing "bog hole" in the bay, form a substrate unsuitable for trawling. Fishermen consider that insufficient research has been undertaken by POL. In referring to Mr Boyd's evidence, he felt the port company could have obtained a lot more information on the fishing industry through better communication with the commercial fishers.

[144] The next witness called by Mr Bryce was **Mr Simon Gilmour**, Executive Officer for the Otago Rock Lobster Industry Association, who reiterated concern as to the impact of fine sediments on the lobster fishery. He sought conditions to prevent the dumping of fine grained materials at the A0 site when wind, currents or other factors would drive the plume into inshore areas, particularly to the *Macrocystis* beds in the north. He considered there should be no fines dumped at the existing consented disposal sites. Instead alternative sites for this material at the head of Otago Harbour should be investigated. He was backed by a statement from Mr Robert Street, which was read by Mr Gilmour. Mr Street, who is an ex Ministry of Fisheries scientist with over 50 years practical and scientific experience of the Otago fisheries, stated that in heavy easterly weather, sediments are transported inshore in Blueskin Bay and he emphasised the importance of the kelp beds to the commercial fisheries.

[145] As an alternative to dumping at sea **Mr Peter Hayden**, who was also called by Mr Bryce, discussed forming islands in the upper harbour as a means of disposing of the dredged material. He believed that the expense of doing this would be not much greater than dumping at sea.

[146] PauaMac5 Inc (No 171), in its written submission stated that its exports are worth about $3.6 million of which approximately 25% comes from north of the Otago peninsula. Its prime concerns relate to the potential for damage to the paua population through smothering of juvenile paua, and the loss of clean rock for larval settlement, as well as the general effects of

turbidity on paua productivity. PauaMac5 considered that the dredged material should be used to reclaim land in Otago Harbour.

[147] The Paua Industry Council Ltd and the Kina Industry Council, in a joint written submission, expressed concern that fine sediments would reach the coast to the detriment of paua and kina. Although the kina fishery is closed to commercial fishing, the Kina Industry Council hopes that it will be reopened under a sustainable management regime. Both councils stated that there had been inadequate consultation by POL and, furthermore, the application did not contain sufficient information to allow the effects of the proposal to be assessed. They maintained that the proposal is contrary to the Act as it would restrict the seafood industry in providing for its social, cultural and economic well-being. Consequently, both councils sought that the application to dispose at the A0 site be declined.

[148] In addition, further evidence on behalf of members of the above group was provided by Dr Brian Stewart, a marine biologist, when he gave evidence for Southern Clams Ltd (No 135).

[149] In closing, Mr Bryce reiterated the concerns of the collective fisheries group and how the existing environment relative to their interests would be affected. He also provided us with a helpful analysis of the relevant statutory provisions to which we shall return later in this decision (Section 8).

[150] **Tania Fishing Company Ltd** and **Karitane Charters Ltd** (No 121). Mr Allan Anderson summarised the operations of these companies and explained that he was primarily a fisherman, including a cray fisherman, but also operates eco-tourism and fishing charters out of Port Chalmers and Karitane respectively. His main issue is the impact of fine sediment from the dredging and the disposal of spoil and its impact on the *Macrocystis* beds where crayfish settle. He was concerned that dumping at the A0 site would also smother small shellfish that are food for elephant fish and that dredging at Rocky Point would be a loss for recreational fishers. He felt there should be no capital dredging in the harbour or dumping of spoil at sea.

[151] **Ms Beatrix Scot-Vossler** appeared on behalf of the **Argo Fishing Company Limited** (No 132). She said that the company has one vessel, although it formerly had two, and it is one of about ten that work the A0 site under quota. The company considers that about 20% of its income from bottom trawling would be lost if consent to use the A0 site is granted. Instead disposal of the dredged material should be at least 12 nautical miles offshore

[152] **Mr Teone Taiaroa** (No 71) is another commercial day fisherman and **Ms Sarah Valk** spoke on his behalf. Mr Taiaroa considered that the economic impacts on the commercial fishery in Blueskin Bay have been grossly underestimated. As a directly affected party there

had been no consultation by POL with Mr Taiaroa about effects that are more than minor. If he is adversely affected then Mr Taiaroa seeks financial compensation. Although extensive modelling has been undertaken as part of the application Ms Valk asserted that local knowledge was not considered. We note that Ms Valk told us she is an employee of ORC but was representing Mr Taiaroa in a personal capacity.

[153] **Ms Leanne Simon,** who spoke to the submission made with her husband **Mr Paul Simon** (No 110), said they own a commercial fishing company based at Port Chalmers. They oppose the applications on the grounds that the impact on Ngai Tahu, now and in the future, far outweighed the need for the proposal. They felt the dumping of spoil would probably change the seabed to the point where they would not be able to trawl.

[154] Aurora Seafood Enterprises Ltd (No 131), and Ms Cath Ellis (No 144), who with her son own a commercial fishing boat, both opposed the application on the basis that the applicant had failed to take into account the importance of the A0 site for commercial trawling by local boats and that the site is a breeding and feeding ground for fish.

[155] Commercial fishers: Mr L. C. Poulson (No 32) and Mr A. Heineman (No 59) and his son Mr G. S. Heineman (No 60), Mr A. Coll of Jackson Bay Fishing Ltd (No 112) and Mr C. J. Pile (No 92), considered that sediment plumes arising from the disposal of spoil at sea would detrimentally affect fishing. The Karitane Fisherman's Association (No 105) opposed both the dredging and dumping because of the threat to the Otago fishery. Mr D R Gardner (No 197), a local fisherman trading as Shearwater Fisheries, considered that disposal at the A0 site would affect his livelihood and, instead, dumping should be in one of the canyons further offshore.

[156] Messrs P. J. S. McGregor (No 18), A. D. Parker (No 19), and G. E. Skinner (No 56) all dive for paua and expressed concern that the dumping of sediment would ultimately affect their livelihoods. Mr P. T. Herbert (No 30), Tide-Song Family Trust (No 113), J. R. and I. J. Harrison (No 122) are of the view that paua and/or kina would be at risk. Some of the submitters felt that the dredged material should be dumped further out to sea or on land.

[157] Ngai Tahu Seafood, although not a submitter wrote a letter in support of the submissions made by Joan Fishing Company (No 119) and Mr Teone Taiaroa (No 71).

[158] Bay Chandlery Ltd (No 127) opposed the application to dump at sea as any reduction in the viability of the fishery would detrimentally affect its business.

Cockle Harvesting

[159] **Southern Clams Ltd** (No 135). The company provided a very full submission and presented a considerable amount of supporting evidence. **Mr Roger Belton**, who is the managing director of Southern Clams Ltd (**SCL**), gave a brief history of the company and its activities. He stated that SCL began commercially harvesting in 1982 but only since 2009, under a Ministry of Fisheries 'Special permit', in Otago Harbour. He said the harbour contains what is probably the biggest biomass of NZ little neck clams (cockles) in the country. The nearby Blueskin Bay with its gyre is a very productive marine system and is the main source of the phytoplankton that sustains the clams. His company produces 900-1000 tonnes/year of clams and fish, of which about 80% is exported. While the dredging activities associated with the proposal are not welcome, Mr Belton stated he had a good working relationship with POL. He sought an effective management plan with substantive strategies to ensure environmental damage is minimal. However, he does not accept that the proposed resource consent conditions and the EMP are sufficient to meet the requirements under the Act to avoid, prevent or mitigate adverse effects on Otago harbour and the Blueskin Bay gyre. He also presented a video at the hearing showing SCL operations.

[160] **Dr Brian Stewart**, who is a marine biologist with experience of Otago coastal waters, gave evidence not only on behalf SCL, but also for the fishing cooperative coordinated by Mr Bryce, to which we have referred above [141]. After assessing the technical reports that accompanied the application, he was of the opinion that the sampling was, in some instances, insufficient to accurately determine the boundaries of particular marine communities. He also felt it was debateable whether the Lower Harbour could be considered a single system. Consequently, in his view, a more intensive ecological survey may have been warranted. He also emphasised the importance of shell islands, which are very rare internationally. No mention of these are made in the POL's AEE even though at least one of the shell islands would be affected by dredging. He considered that additional baseline monitoring was needed, citing 12 months of collection rather than the 6 months suggested. For NTU turbidity measurements he felt 12 months of monitoring, in conjunction with laboratory and/or field experiments on the effects on the flora and fauna of the harbour was necessary to verify thresholds that were suited to local conditions. He also questioned the 1:1 relationship between NTU and suspended solids as stated by the applicant's experts. In addition to the turbidity meters to be located at sites identified in the draft EMP, he recommended two more in Blueskin Bay. The universal use of "green values" on the dredges was also suggested.

[161] In conclusion, Dr Stewart commended POL's decision to employ adaptive management strategies to deal with possible adverse effects as these can be made to work extremely

effectively. Nevertheless, it was his opinion that there would be significant adverse effects in the harbour and in Blueskin Bay. He sought that the applications be deferred until sufficient baseline monitoring, covering at least 12 months, had been carried out to establish thresholds at which adverse effects may occur.

[162] Professor John Jillet is a former director of the Portobello Marine Laboratory. Although he did not appear at the hearing, a statement from him was read out. Professor Jillet considered that the dredging undertaken about 1977 for the development of Port Chalmers as a container port had by far the greatest deleterious impact on the harbour in his 45-year experience of the harbour. These effects were long-lasting and the harbour took 10 to 12 years to recover. He considered that incremental dredging over a long period would have less environmental impact than intense capital dredging within a short time frame.

[163] **Ms Bryony Black**, has a diploma in marine science and a degree in environmental studies and has been engaged by SCL since July 2010 to assess the proposal. Her conclusions were that suspended sediment levels and sediment deposition estimated by SCL pose considerable threats to the validity of the 5-year research consent granted to, as well as to the biomass of the cockle beds themselves. She felt that SCL would have expected the applicant to have initiated specific studies of the ecological and biological impacts of the proposal on SCL's undertaking, rather than virtually ignoring the company. She considered POL's modelling needs to take in a variety of scenarios, including compounding effects of the various stages of dredging, storm events and background suspended sediment concentrations and resuspension of such sediments. These potential detrimental effects put at risk a successful and well-managed fishery.

East Otago Taiāpure

[164] **The East Otago Taiāpure Management Committee** (No 153) was represented by several witnesses. **Mr David Ellison**, deputising for the chairman of the committee (Mr Brendan Flack), provided background to the formation of the Taiāpure Management Committee, including outlining his role. He felt that alternatives to disposal at sea should be investigated more broadly and suggested that sand could be shipped to islands in the Pacific. A sizeable bond should be sought from POL.

[165] **Mr Greg Kerr**, described by Mr Ellison as a future Kaumātua, told us that the dumping of spoil poses the greatest potential challenge to the Taiāpure Committee.

[166] **Ms Anne-Marie Jackson**, who is a doctoral candidate in customary fisheries management at Otago University, told us that the Taiāpure was created under the Fisheries Act

1996. She presented a summary of the legal basis for the committee, which comprises, equally, representatives of Kāti Huirapa Rūnaka ki Puketeraki and representatives from customary, commercial and recreational fishers, local environmental groups and the University of Otago. She went on to say that the committee's concerns are the potential detrimental impacts of dumping at the A0 site, sedimentation and a decrease in light penetration at rocky reef habitats. The Taiāpure Committee feels that not enough is known about the dynamics of currents north of the A0 site adjacent to the Taiāpure, and expressed caution about the limitations in computer modelling. A lack of funding has meant that the committee cannot scientifically challenge the evidence put forward by the applicant.

[167] **Dr Chris Hepburn**, has undertaken marine research in Otago coastal waters over the past 10 years and has supervised three doctoral candidates and a number of masters and diploma students in that time. He spoke particularly about the rock reef habitat and noted the importance of the kelp beds. He had advised the Taiāpure Committee of the risks posed to the Taiāpure by the proposed use of the A0 site.

[168] **Mr Peter Russell** is a doctoral student in physical oceanography. He has 5 years experience in surveys and current measurement and is concerned about the reliability of the hydrodynamic model. He considers that not enough is known about the currents at and in the vicinity of the A0 site. Satellite imagery and other data, along with limitations in the computer modelling undertaken on behalf of POL, throws doubts on the conclusions reached and he said that Blueskin Bay is a sediment trap.

Surfing

[169] **Mr Brett Gray** appeared as Counsel for **South Coast Board Riders Association Inc** (**SCBRA**) (No 106). He explained the origins of SCBRA, which was not opposed to the dredging of the harbour *per se* but opposes disposal offshore at both the existing sites and at A0. Mr Gray then drew our attention to Policy 16 in the NZCPS, which refers to surf breaks of national significance. The SCBRA feels that its concerns have been brushed aside even though two of its representatives were part of the Public Consultative Group during development of the proposal. It is opposed to any increase in dumping at the three authorised sites even though current levels are less than that allowed under existing consents. Since dumping began at these sites, surfers have observed adverse changes to the quality of the waves, which they attribute to disruption to the swell corridor. The SCRBA, therefore, was opposed to any variation of the existing consent at the Aramoana Spit where the wave break has deteriorated. Apparent confirmation of this is that waves now break further offshore. Instead the SCRBA advocates alternative disposal to dumping in Blueskin Bay and suggests the material be used to replenish

southern beaches. It asks that that a condition be imposed on the applicant to consider these matters as well as the establishment of a CamERA[3] site above the existing dump sites along with robust monitoring. Two SCBRA representatives **Mr Graeme Carse** and **Mr Brett Hastie** were also in attendance and gave details of the various surfing beaches.

[170] **Mr R Rust** spoke to his submission prepared with Ms N Durrant (No 161), and also referred to the submissions by Mr Paul Shanks (No 81) and that of his son, Mr J. R. Rust (No 180) in voicing concern for the surf breaks. He asked that alternatives to dumping in Blueskin Bay be investigated, such as to coastal areas depleted in sand. Rock dredged from the harbour should be added to the Mole or used in repairing the Long Mac wall and other harbour groynes.

[171] The submission from the **Surfbreak Protection Society Inc** (No 157) was prepared by **Ms Nicola Reeves**. In the absence of Ms Reeves, the submission was presented by **Mr J N Hutching**. He described the surf break at Aramoana and concluded that the area was currently "full" of sediment. He asked that we recognise the national and international significance of the surf waves at Aramoana and beaches to the north of it, and that they be preserved and protected in accordance with the RPS. The society also sought further bathymetric surveys and modelling. Ms Reeves did attend the hearing during the submission from the South Coast Board Riders Association and showed us a well-prepared video that she has produced.

[172] **Mr Paul Shanks (**No 81) is a champion surfer. He did not oppose the dredging but did not want spoil dumping in Blueskin Bay. While, in his opinion, the dumping of spoil off Aramoana had improved surfing, it could not accommodate any more material without detriment to the wave breaks. As for the proposed new dumping, it is unknown how much of it would move north to affect other wave breaks. He cited the need for further research before the consents could be granted as well as testing of water quality.

[173] **Ms Laura Blake** (No 156) who is an experienced surfer living at Warrington, confirmed that her family have witnessed the build-up of sand on Warrington Beach over the past 20 years. She believes that the existing dumps in Blueskin Bay are approaching maximum capacity and that the Aramoana Surf break is currently adversely affected. Ms Blake considered that the AEE for the A0 site does not take into account the cumulative effects of all the dumping of spoil in Blueskin Bay. She felt that, because of the risk to the environment, rock should not be dumped at Heywards Point. Instead the rock should be used where shoreline protection from erosion is needed. Biodiversity in Blueskin Bay is only now beginning to recover from the last round of dredging. If consents are granted she would like to see rigorous

[3] A recording system operated by NIWA that provides real-time images of beaches throughout New Zealand.

water quality testing to determine the toxicity of the materials to be dumped. There is also a need for an alternative plan if the dredging results in adverse effects.

[174] Mr David J. Wooffindin (No 6) believes that, from years observations while surfing in Blueskin Bay, the disposal of material dredged from the harbour is having a detrimental effect on quality of the surf at Aramoana. He along with Messrs D. G. Kilpatrick (No 21), Mr O. Williams (No 23), Mr T. Harris (No 35) and Ms A. Woolley (No 82), seek that monitoring of the waves should commence prior to any further disposal of dredgings at sea. If the applications are granted, and any changes in the wave patterns are detected, then the consents should be reviewed. Similar concerns were also expressed by Mr A Sutherland [176], president of the Big Rock Boardriders, who were also concerned, not only for Aramoana, but also Karitane, which is world class. Others opposing the applications and having an interest in surfing are Messrs N. Shaw (No 36), P. R. Anderson (No 37), M. Gunson (No 46), T. Leckie (No 51), M. A. Jenks (No 55), B. Harrison (No 58), D. Westcot (No 74), E.A. Whitaker (No 87), T. F. Wallis (No 88), and Ms J. Hayhurst (No 66), Ms E. Vanderburg (No 164), Northside Boardriders (No 169) and Professor R. Mahoney (No 39).

Warrington

[175] The Warrington Reserve Group submission was prepared by Wiremu Bretton (No 8). The group's submission maintains that the POL's scientific data on impacts arising from use of the disposal sites is flawed and insufficient to reasonably predict the long term outcomes. A similar position was taken by Ms G. Tait (No 168), who a member of the group and also of the Blueskin Bay Whale Watch Society Inc. She stated that suspended sediment could pose a risk to Hector's dolphins, Hooker's sea lions and other species. In the estuary, damage would include wholesale destruction of some reef communities and, like the open sea, there is insufficient scientific information. Ecological degradation has also occurred in other estuaries along the coast. Ms R. Hesson (No 7), a Warrington resident with significant cultural ties to the area, stated that there is not enough evidence to prove that the environment is not at risk of ecological damage. Until more evidence to support the proposal is forthcoming, the applications should be declined. Mr W. M. Faasega (No 9) was of the view that the applications are being rushed and that the spoil dumping should be another 50 km offshore. Ms S. L. Woods (No 34) considers that dumping offshore would affect Warrington. Ms J. Upton (No 146) opposed the applications on the perceived threat to the coastal environment north of the A0 site, which in her opinion has not been adequately modelled.

[176] **Mr G. V. and Mrs V. M. Kerr** (No 129) objected to the dumping of spoil at the A0 site, which they maintain has not be adequately researched or modelled and there are

uncertainties as to monitoring. The material to be disposed includes 37% of fine sediment, which they considered would be detrimental to marine life. In speaking to their submission Mrs Kerr said that turbidity meters should be installed and monitored on the landward side of the dump site.

[177] The community-based River-Estuary Care: Waikouaiti-Karitane [108] opposed dumping at sea on the grounds that the outcome was uncertain, there could be detrimental effects on habitats and ecosystems, inadequate modelling, and the potential for a build-up of sediments in the Waikouaiti River estuary.

Otago Harbour

[178] **Associate Professor M F Barker** (No 65), of the Marine Science Department at Otago University, expanded on his written submission. He told us that his main concern was the ecological effects arising from an increase in suspended sediments within the harbour as a result of the dredging. The sediments to be dredged closest to the port are mostly fine-grained (silts and clays) and these can have a range of effects on marine habitats and invertebrates. This can lead to a changing substrate clogging filter feeding and respiratory structures, and decreasing light levels. While most species can tolerate these effects for short periods, the long term result is usually mortality. Many of the processes that could be affected by suspended sediments are poorly understood. He concluded that, if consents are granted, then monitoring of the environment needs to be implemented well in advance of works commencing. A critical question to be answered is the appropriate level for suspended sediments. In a subsequent email to ORC, dated 18 April 2011, Professor Barker advocated two monitoring sites as close as possible to habitats of critical importance near the Portobello Laboratory, and he discussed how this monitoring could be measured. He felt that it would be better for the dredging, and the disposal of resulting spoil, to be spread over a longer, rather than shorter time span.

[179] **Professor Gary Wilson** (No 165) of the Marine Sciences Department at the University of Otago, expressed concern that dredging near Port Chalmers would cause deposition of fine-grained sediments to the detriment of the harbour fauna, particularly filter feeders. He was concerned that this could also affect the quality of water used in the Portobello Marine Laboratory.

[180] The **St Martin Island Community Inc** (No 134) was represented by its vice-chair, **Mr Christopher Brown**. He explained that the community is an incorporated society and charity that leases land on Quarantine Island from the Department of Conservation and has a lodge that sleeps 26 people. It is used by groups, as well as schools, and some of its activities could be restricted if the ecology of the coastal waters is affected by silt deposition. This would reduce

water clarity, affect where boats are accessed by the groups using the community's facilities, and diminish educational opportunities.

[181] The submission from the **Save the Otago Peninsula (STOP) Society Inc**. (No 102) was presented by **Ms Lala Frazer**. The society's main grounds for opposition were that the dredging would have adverse effects on the marine environment, that benthic communities may never fully recover, and that it is not possible to predict the effects of the proposal. Larger vessels using Port Otago could have more destructive wakes and the long term effects of dumping at sea may have been underestimated. Ms Frazer supported the view that the dredged material should be used to form islands in the Upper Harbour thereby reinstating lost intertidal habitats. She said this would further enhance Dunedin's marketing of itself as the wildlife capital of the world.

[182] **Mr Bernard Mullane** (No 68) of Waikouaiti, told us that, from his own research, which he qualified "as a lay person", he disagrees with POL's evidence that the level of contamination in the sediments to be dredged would be below ANZECC guidelines. He is concerned about the contaminants released by the dredging and considers that dumping at sea would have adverse effects. He would like to see more research before dumping commenced.

[183] Others voicing concern in written submissions that not enough research had been done to determine the impact of the project on the environment, included Mr P. H. Young (No 17), Mr H. Black (No 45), Mr T. Brough (No 63), Mr M. Trewern (No 70), Mr G. N. Morris (No 72), Mr Glenn Robinson (No 76), Mr Jason Ross (No 84), Dr N. J. Cullen (No 85), Mr S. De Graaf (No 98), Ms T. Atkinson (No 99), Mr M. M. Cowell (No 137). Many of the above highlighted the impact the project would have on fisheries. Dr P. E. Walker and Ms J. E. Aimers (No 111), who have concerns for benthic habitats, and reduction or destruction of bird feeding areas, maintain that there is insufficient scientific data to grant the applications. A similar submission was lodged by Drs K. Fisher and C. Davidson (No 133) who stressed that the harbour is for everyone and is not just a commercial entity. Ms R. Richards (No 61), Dr Seabourne Rust and Ms D. Yanakopulus (No 117) and Hardy Street Enterprises Ltd (No 118) opposed the application to dredge the harbour due to the potential adverse effects on its ecology.

[184] Ms F. Butcher (No 100) asked that POL withdraw the applications until it has undertaken more open consultation with the Otago community.

[185] Ms R. K. James (No 64) opposes disposal at the A0 site as she believes the dumped material could move onshore, but she gave conditional support to the dredging itself provided a thorough assessment of the marine life in the harbour was completed prior to work

commencing, and that there is ongoing monitoring. The material dredged could either be disposed to land or to a site further offshore than A0 that has been accurately modelled as to sediment distribution.

Careys Bay-Port Chalmers

[186] The submission from the **Careys Bay Association Inc**. (No 140) was presented by **Ms Cheryl Adams** accompanied by Mr Ian Stephenson. They also jointly presented a personal submission to which we shall refer later. Ms Adams told us that the association is not against POL or, necessarily, further development of the port. Broadly, the association's principal objectives is that residents of the Careys Bay are able to occupy and enjoy their properties without their health and well-being being adversely affected. In addition, the association aims to preserve the special character of the bay coupled with ensuring that there were no adverse effects on the coastal environment. She advised that the consultation undertaken by POL had been disjointed and the company had shown little willingness to address the association's concerns.

[187] Ms Adams went on to say that the Multi-purpose Wharf extension would be an intrusion into the bay with associated noise being the residents' greatest concern. The association was critical of the current regime for monitoring and addressing noise-related issues as this allows the port to avoid certain obligations inherent in the Act . Nor would the existing regime fulfil the requirements of s.16 of the Act. The association also noted that while POL had spent $1.27 million dollars on sound-proofing or purchasing properties adjacent to the port, it had only spent a fraction of this amount mitigating the noise at source. In referring to the evidence given by POL's noise expert, Mr Ballagh, the association was concerned that it may have been biased towards the company and Ms Adams went on to address what she considered were deficiencies in his report. With respect to the proposed dredging, she sought constraints on hours of operation. The association was of the opinion that alternative berthing arrangements, by turning the Beach Street Wharf into a container berth, could negate the need for the Multi-purpose Wharf extension. She said this would reduce potential noise and light spill impacting on Careys Bay residents as well as ensuring its present character is not permanently lost. This, in turn, would prevent a fall in property values that she considered would eventuate if the Multi-purpose Wharf extension proceeds. The association therefore sought that the application be declined.

[188] **Ms Kris Nicolau** (No 11), who attended much of the hearing, left us in no doubt as to the extent that she considered she would be adversely affected by the proposal to extend the Multi-purpose Wharf. In forcefully presenting her evidence she emphasised the impacts that

she and others living in Careys Bay would experience if the PNG proposal proceeds. Adverse effects listed in her submission would, in her view, include increased noise, visual impact of cranes and containers, light spill and the intrusion of the fishing jetty, which she felt may later be converted into a commercial port structure. She questioned the economics of the project and expressed little confidence in the ability of the noise modelling to predict what would actually happen in Careys Bay.

[189] **Mr Joseph Cecci** (No 14) has been a resident of Careys Bay for 36 years and is the Careys Bay Association's representative on the Port Noise Liaison Committee. He informed us that the bay is an amphitheatre that traps and amplifies noise. This had not been an issue until POL extended its operations when it reclaimed land in the vicinity of Boiler Point. He said any extension of the Multi-purpose Wharf would only worsen the impact of noise and light spill into Careys Bay. He disputed the evidence of POL's noise expert, Mr Ballagh.

[190] **Ms Judy Fisher** (No 22) expressed similar concerns to other Careys Bay residents and stated that she is affected by port noise at night several times a week. She told us that, although keen on fishing, she thought that the proposed fishing jetty looked very much like Port Otago creep and that she was worried that the cost of the port development would be met by ratepayers. She sought a limit on construction time.

[191] **Ms Naomi Wilson** (No 42) has lived in Careys Bay for 42 years. She summarised the changes that had occurred in that time, including the destruction of Observation Point by POL. She told us that POL continued to breach the rules regarding noise and that the current noise regime was farcical. In her opinion, POL needs to spend more of its profits on noise mitigation. As for the A0 disposal site she felt that there was insufficient information as to the effects that dumping of such a huge quantity of sediment would have on the environment. Ms Wilson also sought examples of the reasons that POL would use to close the proposed fishing jetty. She urged that consents not be granted until POL behaved as a good corporate citizen.

[192] **Ms Katrina Varian** (No 86) has been a resident of Careys Bay for 30 years. She spoke of the bay being a very sheltered environment, very protected from wind and protected from port noise. She believed this would no longer be the case should the Multi-purpose Wharf be extended. She sees the port as a noisy neighbour. She acknowledged that the fishing jetty would be used but its construction does not compensate for the noise emanating from the port.

[193] **Mr Philip Murphy** spoke on behalf of himself and his wife Ms Sylvia Clarkson. He explained the changes that had taken place at Port Chalmers since he moved to Careys Bay in 1977 and how the bay had been affected, particularly by port noise. He described the different types of noise emanating from the port, such as moving empty versus full containers around the

container yard, or from shore to ship and vice versa. Not only would there be greater visual intrusion if the port extends towards Careys Bay but also the container cranes, which now rise above the intervening hill, would be even more visible. They want an independent body to ensure noise compliance and to have outstanding claims over double-glazing resolved. The cost of this and other mitigation measures would be a small fraction of what is to be spent on the PNG proposal. He and his wife also oppose the fishing jetty, viewing it as a sop to the public, and he went on to accuse the port company of a hidden agenda as to its ultimate function.

[194] **Ms Cheryl Adams** and **Mr Ian Stephenson** (No 128) are both professionally qualified engineers living in Careys Bay, some 1.2 km in a direct line of sight from Boiler Point. Ms Adams explained that, typically, noise nuisance occurs weekly over a two-day period coinciding with the weekly visits of larger container vessels. She pointed out that the residential area was not sited close to a busy working port, but rather that the port has expanded into Careys Bay. They and other residents are concerned that there are no enforceable noise limits in the Dunedin District Plan. The existing Port Noise Management Plan is inadequate as it fails to provide proper protection for the health and well-being of residents. While they have been actively involved in the Project Consultative Group, Ms Adams said that the process has been disjointed and, in some instances, inadequate. Failure to get any readings of port noise taken at their property prompted them to buy, at a significant cost to themselves, sound measuring equipment. She then went on to present three months of measurements. On the basis of these measurements 14 complaints were made but, other than being noted, no other action was apparently taken. She felt that the best practical option is to prevent the extension of the Multi-purpose Wharf. If POL is not able to mitigate the noise at or below a level normal for residential noise limits, Ms Adams considered full mitigation and/or compensation should be made to those affected. She would be happy if POL was required to comply with the appropriate NZ Standard.

[195] **Mr Grant Miller** (No 181) expressed similar concerns to other submitters from Careys Bay in opposing the applications. He suggested an alternative berthing arrangement at the port. Basically this was to berth cruise ships at the Multi-purpose Wharf and concentrate all the container operations closer to Port Chalmers. Property owners should also be compensated for loss in the property values.

[196] The submission of Mr Chris Hilder (No 184) was read by Careys Bay resident Ms Nicolau as Mr Hilder was not able to attend the hearing. In his submission, Mr Hilder concentrated on the noise emanating from the port and argued that, as there are no enforceable noise controls, the application should be declined.

[197] **Mr Blair Smith** (No 150), in speaking to his submission, challenged POL's claims that the effects of the proposal would be minor. He considers there are a huge range of negative impacts on the harbour generally and, specifically, on Careys Bay residents whose views have been disregarded. He said the stability of Rocky Point is also an issue.

[198] Ms B. Thomas (No 182) also expressed concern as to the stability of Rocky Point if blasting goes ahead, and she noted that no stability assessment appears to have been undertaken.

[199] **Dr G Brent Hall** spoke to the detailed submission (No 172) prepared with Ms M. R. Hall. Dr Hall is Dean of the School of Survey at the University of Otago. He said he and his wife had purchased their home in Careys Bay in 2006. The reason for doing so was its outstanding views and the character of the bay. He went on to criticise the scant attention given in the application to existing noise. He argued that the Marshall Day assessment of noise undertaken for POL is flawed and he disputes that only 12 houses in Careys Bay would require noise mitigation if the Multi-purpose Wharf is extended. Dr Hall also maintained that stacking containers up to 5 high at Boiler Point exceeded the terms of POL's consent. He considered that the Port Environment Committee could be more effective.

[200] Ms Joanna M. Kidston (No 174), on behalf of the Careys Bay Hotel (2008) Ltd., considers that the proposed extension of the Multi-purpose Wharf would change the character of Careys Bay and impact detrimentally on the viability of the hotel.

[201] Other Careys Bay residents who made submissions in opposition were Ms Kathryn Farhi (No 10), Ms Julia Hume (No 40), Ms J. M. Kidston (No 79) and Ms B. Ferguson (No 154). They considered the proposed wharf extension would diminish their enjoyment of their properties as well as the quality of the environment. Ms Julie C. Cecchi (No 12), Mr J. W. Foerster (No 38) and Mr D. S. Reid (No 89), in expressing similar objections, drew attention to the impact the port would have on the unique characteristics, and tourist and historical values of the Careys Bay. Messrs T. A. Baines (No 28) and P. M. K. Sales (No 29), both long-term residents of Careys Bay, have seen the port grow from an unobtrusive operation to one that now dominates the area. In Mr Baines' opinion, POL operates under a very favourable noise consent that gives little protection to affected residents. Suspended sediment from dredging and the onshore migration of sand from the disposal sites were amongst other matters raised by Mr Baines, as well as by Mr N. D. M. Gardner (No 52). They also considered there had been insufficient investigation of the effects of the proposal. Ms N. Bould (No 44) is concerned about noise, and the location of the disposal sites and the speed at which dumping would occur. She considered this could have the potentially devastating outcome of siltation on the coast. Ms

K. L. Greager (No 41) wrote in her submission that noise was a major concern and she was also generally concerned about the marine life within the harbour.

[202] Ms S. M. Stephenson (No 33), of Port Chalmers, listed a number of potential adverse effects on the environment, both in the harbour and in the open sea. She also objected to the extension of the Multi-purpose Wharf and the extra noise it would generate.

[203] Mr Terry Pairman (No 75), of Port Chalmers, claimed that earlier dredging had caused offensive odours and, for that reason, the application should be declined. Amongst his other concerns, such as noise and impacts on the cockle beds, he felt that the timetable for the dredging consent of 15 years was too long.

Deborah Bay

[204] Deborah Bay Residents' Association (No 152) has similar concerns to the Careys Bay Association and the residents of that bay who have made submissions. In addition to the intrusion arising from construction and operation of the Multi-purpose Wharf, the increase in the size of vessels resulting in detrimental wave action in Deborah Bay was also of concern.

[205] Mr D. C. Reid (No 91), a photographer of Deborah Bay, also opposed the application and, in particular, singled out the loss of the night sky should the Multi-purpose Wharf, and its attendant lighting be extended.

Aramoana

[206] **Mr Adrian Hall** spoke to his own submission (No 185) and also that of the **Aramona Conservation Group** prepared by Mr Bradley Curnow (No 178). Mr Hall holds an Associate Professorship at the University of NSW and is Artist Adjunct at the Otago University School of Art. He has been a resident of Aramoana for 10 years. Mr Hall expressed concern as to the effect the dredging could have on the Aramoana salt marsh, the loss of tidal flats by widening the shipping channel along with potential collapse of the cut batter. The effects on birds using the salt marsh, including disturbance from noise, was also raised as were the effects that dumping at sea may have on Hector's dolphins and other species. If the applications are granted the Aramoana Conservation Group wants monitoring put in place to ensure the welfare of the flora and fauna in the area. The group felt that, if the project goes ahead, its effects could be irreversible. Mr Hall expressed concern that the Blueskin Bay gyre would carry fine sediments into sensitive sites.

[207] Ms Jean Bretherton (No 13) opposed the dredging if it should result in damage to the Aramoana salt marsh. Ms A Todd (No 151) wrote that her main concern was the Aramoana

area and she felt that, if the proposal proceeded, it along with sea level rise would detrimentally impact on the spit, which is already under stress. More information on the potential effects are needed before consents could be granted.

Dumping of spoil at Sea

[208] **Ms Samantha Jackson** (No 167) is a student at Otago University. She opposed the application and cited the detrimental effects dredging and the dumping of spoil would have on the harbour and the A0 site. She told us that POL's public consultation had been inadequate. From her own observations she has noticed adverse changes to local beaches. If dredging does go ahead Ms Jackson wants a formal agreement with iwi over the cockle beds that are at risk from dredging, particularly from suspended sediments. She also referred to a petition opposing the application that was part of her written submission and which had attracted 207 signatures.

[209] **Mr David Karena-Holmes** (No 192) of Dunedin, was of the view that because of the environmental damage, the port should be downsized and a major rethink was required.

[210] In written submissions, Ms J. D. Nicolau (No 24), Mr R. J. Nicolau (No 25), Mr D. Nicolau (No 26) and Mr B. Nicolau (No 27) expressed their opposition to any dumping of dredged material at sea and referred to the rights of Ngai Tahu. Mr B. Nicolau also stated that shipping lanes disrupt breeding and fishing grounds with the risk of pollution from vessels. Mr M. J. T. Linzey (No 69) is concerned about potential adverse effects from dumping on surfing, fishing and shellfish gathering, as well as noise at Port Chalmers. Others opposing the proposal are Ms A. M. Parsons (No 94), Ms L. Mitchell (No 162), Ms F. McLachlan (No 163) and Ms E. Buky (No 166).

[211] Mr W. D. Brown (No 77), Mr B. Smith (No 78), B. Stuart-Menteath (No 80), Ms F. Griffin (No 83), R, J and P Yates (No 155), Ms R. Fairhurst (No 160), Mr Wiremu Bretton (No 188), have a range of concerns. Ms M. Guerra (No 189) felt that if the applications were to be approved it should be on the basis that A0 site should be completely avoided. Ms K. E. Burke (No 191) was against dumping of mud offshore. B. H. and S. Knight (No 115) were simply opposed to the application.

[212] Professor C. A. Landis (No 96) has undertaken considerable research into marine processes off Otago and is broadly in support of the proposal. While he does not expect significant deposition of fine silts and clays from the A0 site, he felt that a clearer scientific case for the dumping could have been put forward, and that further data and monitoring is required.

Conservation and science organisations

[213] **Ms Pene Williams** appeared as Counsel for the **Director General of Conservation** (**DOC**) (No 186). She was accompanied by Mr Bruce Hill, Mr Bruce McKinlay, Mr Graeme Loh and Mr Jim Fyfe who were available to answer questions. Ms Williams opened by outlining DOC's concerns and then went on to advise that these concerns had been met through an agreement reached between DOC and POL. The agreement contains a number of conditions that both parties seek to have adopted should the applications be granted. These require that no activity takes place near sensitive sites when they are being used as significant habitat for indigenous fauna, as well as POL taking actions to avoid interaction with aggregations of seabirds and any marine mammals. POL would also be required to undertake baseline monitoring and establish an ongoing study to determine what effects on the physical and biological environment may result from dumping at the A0 site. POL was also to establish and service a technical group, which would receive and assess monitoring data and be able to make recommendations to POL as to changes that need to be considered and, if practical, implemented. Ms Williams also provided us with a helpful analysis of relevant statutory provisions in the Act and the NZCPS.

[214] **Mr Bruce Hill**, who is a Conservation Officer– Resource Management Act Planning with DOC, appeared as a witness for the Director General. Mr Hill explained how DOC had reached agreement with POL and provided an outline of relevant statutory considerations. He also provided us with a set of draft proposed conditions that had been agreed to between DOC and POL and which DOC wished to be included in the conditions if consent is granted.

[215] The submission from the **Otago Conservation Board** (No 158) was presented by the Chair, **Ms Abigail Smith**. The Board understands that the proposed deepening of the harbour channel is a necessary part of POL's forward planning and is important for the economic viability of the port's future operations. The Board was concerned that there is not enough information on potential adverse effects on marine organisms, seabirds and the Aramoana salt marsh. If consent is granted, the Board seeks the inclusion of a range of conditions concerning dredging, spoil disposal and monitoring. We shall come to consider these at the appropriate time in the event that consent is granted.

[216] **Ms Janet Ledingham** (Chair) presented the submission from the Dunedin Branch of **The Royal Forest and Bird Protection Society** (No 173). She was accompanied by Mr Derek Onley who is a well-known ornithologist. The Society opposed the application because it believes there is potential to harm threatened and at risk birds and mammals although Ms Ledingham noted that POL had been willing to engage in discussion on this. She then went on

to comment on the concerns listed in the Society's written submission with respect to the proposed conditions on dredging, and the draft EMP that formed part of POL's case. While a number of concerns had been met, some still remained. A number of conditions were sought. These included the need for rigorous baseline seabird monitoring prior to dredging, the setting up of mitigation procedures to minimise the effects on seabirds, marine mammals and fish. The protocols for this should be agreed in consultation with the Department of Conservation. She said more work needs to be done on modelling the sediment plume from the A0 site and turbidity meters should be permanently installed at the site. Optimum conditions for settlement of bladder kelp also need to be established. Within the harbour, indicator species should be identified to determine the effect of silt deposition on the health of marine organisms.

[217] Mr Onley gave evidence in support of the Forest and Bird submission. He made the point that the sea off the Otago coast, in and adjacent to the A0 site, is important to a wide range of internationally significant seabirds and that data on their ecology and habitat is inadequate to make informed projections on the effect of disposal of material at the site. The list of birds provided by Mr Onley was more extensive than that of Mr Sagar, one of the applicant's witnesses. Mr Onley also challenged the assumption that, because birds are mobile, if disturbed, they can go elsewhere but feeding grounds are not uniformly distributed. Also, some species in the harbour are declining but the reasons for this are not known. He maintained there is insufficient information to predict the consequences of dredging. Similarly there was no in-depth data for species that forage at the A0 site and that concise, detailed, systematic data should be gathered and a control area identified. He also considered that a report should be compiled on the effects of disruption of the planktonic and seabed communities on the higher food chain, especially those species that form important parts of the diet of local birds.

[218] **The New Zealand Marine Sciences Society** was represented by **Associate Professor Elizabeth Slooten** who is one of two local council members. The society, which has some 260 members, had a range of concerns and opposed the application. In speaking to the submission Professor Slooten said that after hearing the evidence of the applicant's witnesses some of the society's concerns had been met. The London Protocol on dredging would mostly be met and the society did not dispute the results of the modelling undertaken by POL. The society felt that *pilot dumping* should be carried out to see where the sediment went, particularly fine-grained suspended matter. She considered this was necessary to provide *empirical validation of the modelling*. Until this and other research was undertaken then, in the society's opinion, conditions of consent cannot be formulated. Professor Slooten proposed a number of conditions that should be met before consents are granted.

[219] **Dr Richard Reeve** appeared in support of his personal submission (No 147) and also on behalf of **Friends of the Harbour** (FROTH) (No 179). Dr Reeve dealt firstly with a range of matters in the Act. He stated that FROTH's focus was to ensure there were robust conditions to avoid, remedy and mitigate adverse effects as per s.5 of the Act. The adverse effects identified by FROTH included: suspended sediment and its potential to smother or otherwise detrimentally affect marine flora and fauna; disturbance of the feeding and breeding environment of endangered species such as Hector's dolphin and the blue penguin; destruction of habitats; and noise and light pollution. FROTH was of the view that all monitoring must begin well before work starts, and there should be conditions that obligatorily engage other statutory authorities in the consent monitoring procedure. It was suggested also that a bond be required from POL. Dr Reeve, on behalf of FROTH, then offered various amendments to the conditions that had been proposed by others.

[220] The submission from the **Yellow-eyed Penguin Trust** (No 170) was presented by **Mr David McFarlane**, Field Manager. He was accompanied by **Dr Thomas Mattern**. Mr McFarlane told us there are penguin breeding sites at Aramoana and smaller sites at Penguin and Pipikaretu beaches. Overall, the Otago Peninsula has 47% of the South Island breeding population of this species of penguin. It is also an important component of the Otago Peninsula eco-tourism industry. Yellow-eyed penguins are inshore and benthic or bottom foragers, travelling up to 20 km during trips and diving to depths of 40 to 80 m. Thus, they are not likely to forage at the A0 site. Mr McFarlane referred to Mr Sagar's affidavit, prepared on behalf of POL, in which it was stated pre-dredging and then ongoing monitoring of both yellow-eyed and blue penguins was not necessary. The Trust disagreed with this and offered three GPS dive loggers free of charge, and asks that POL shows more consideration in dealing with the possible effects of the proposal, particularly on yellow-eyed penguins.

[221] Dr Mattern provided expert evidence on penguins, in support of the Yellow-eyed Penguin Trust's submission. He holds PhD and MSc degrees in zoology from the University of Otago and is the New Zealand representative on the International Penguin Group of the World Conservation Union Species Survival Commission. Dr Mattern explained that yellow-eyed penguin differs from other penguins in that it forages almost exclusively on the seafloor. The number of yellow-eyed penguins adjacent to the A0 site is significant (up to 90 breeding pairs) although the extent of Blueskin Bay that is utilised by these penguins is unknown. Elsewhere, the penguins utilise areas where there are horse mussels as they provide a hard substrate for benthic faunas. Horse mussels are present in the north of Blueskin Bay and, if present, at the A0 site are unlikely to survive the dumping of spoil. Dr Mattern concluded that there is potential for a considerable portion of the local population to be affected by the proposed

disposal of spoil. He recommended establishing the extent to which horse mussel fields in Blueskin Bay are being utilised by penguins, and initiating an annual monitoring programme of the foraging and feeding success of yellow-eyed penguins to assess whether reproductive performance is compromised by the proposal.

General

[222] **Mr Laurence Smith** spoke to the joint submission (No 130) he had prepared with **Ms Elizabeth Sherwood.** Mr Smith told us that they are both regular users of Otago Harbour and the adjacent coast, and partake in recreational gathering of shellfish as well as fishing. Their concerns are that these activities would be adversely affected by the dredging and dumping of spoil. They sought that independent water quality monitoring with properly defined environmental limits be established and implemented before dredging commences. Appropriate dredging technology should be used to minimise the production of suspended sediment. If the limits are exceeded then dredging should cease. The results of this monitoring should be listed daily on POL's website. Finally, they wanted the dredging to be done in the shortest possible time. However, they acknowledged they had not seen the proposed revised conditions agreed to between DOC and the applicant.

[223] Ms G. McGrath (No 193), is the WWF NZ Hector's Dolphin Community Coordinator. She felt that there had been very little consideration of potential impacts on marine animals and seabirds in the area that would be affected by dredging and dumping of spoil. She was particularly concerned about the use of explosives at Acheron Head and Rocky Point. Ms McGrath elaborated on the decline in the dolphin population numbers and the resulting genetic fragmentation, which has serious implications for the species survival. She referred to the presence of sea lion cubs on Otago Peninsula indicating mainland recovery of this species. Ms McGrath considered that information on levels of contaminants in the harbour sediments, and the impact of sediment dispersion from the A0 site, were inadequate or insufficient.

[224] Dr J. West (No 195), whose PhD thesis was on the environmental history of Otago Peninsula, stated that, while he accepted that ongoing dredging of the harbour channel was necessary, he was concerned about the very large amount of material that would be dredged in a short time and disposed in what are inshore waters. Because of this there is the potential to cause dramatic change. His concern in the harbour is that the cockle beds may be polluted or smothered. Offshore, the spoil disposal would amount to 30 years of the shelf's natural sediment load being deposited in 6 months. This would effectively have severe long-term effects on an area 25 km square. He suggested that, to remove all doubt as to the effects of this disposal, the dumping should be beyond the continental shelf. He noted, that this is consistent

with the requirements of the Kai Tahu ki Otago Natural Resource Management Plan, 2005. He questioned whether what is proposed meets the objectives of Part 2 of the Act.

4.4 Applicant's right of reply

Mr Coe

[225] Mr Andersen, during his right of reply on behalf of POL, advised that Mr Coe had prepared a supplementary statement of evidence that dealt with matters that had arisen during the hearing. We shall report first with what Mr Coe had to say. In his supplementary statement he addressed:

- the relationship between widening the Swinging Basin and the adjacent Shell Bank;
- Te Rauone Beach issues;
- an additional condition that has been proposed regarding the Long Mac Wall;
- the relationship between turbidity and suspended sediment concentration;
- when access to the Fishing Jetty might need to be suspended;
- alternatives to marine disposal of dredged material; and
- operation of the proposed "Technical Group".

Where relevant, we shall refer to the more technical aspects of these issues at the appropriate place in our discussion of the effects of the proposal in Section 6 of this decision.

[226] In response to a claim by a submitter (Dr Stewart for Southern Clams Limited) that the effects on Shell Bank of widening the Swinging Basin had not been assessed, Mr Coe maintained that this was because no effects had been identified, due to the distance of Shell Bank from the proposed works.

[227] Mr Coe referred to the erosion at Te Rauone Beach and its likely causes, and the steps that were being taken to mitigate this although the latter will be the focus of a separate application for resource consent.

[228] The effects of fine sediment released during dredging operations was an issue for many submitters. POL have proposed that turbidity (NTU units) be measured continually for all the early stages of the incremental dredging, as well as throughout the major capital dredging programme. It is, however, suspended sediment concentration (SSC) levels that are mainly of interest and we had asked Mr Coe during his earlier presentation of evidence what the relationship was between NTU and SSC for Otago Harbour. Mr Coe clarified the origin of information provided by Dr Chris Hickey in an email (dated 7 April 2011) a copy of which had

been given to us on 11 April 2011. Dr Hickey had provided a graph showing the relationship between NTU and SSC as close to 1:1. The graph was based on data collected during 3 months of turbidity monitoring in Otago Harbour undertaken by NIWA. The report produced was titled *Turbidity Monitoring in Otago Harbour - Data Report*, prepared by Evan Baddock, December 2008, and a copy was attached to Mr Coe's supplementary evidence.

[229] POL would retain the right to restrict public access to the fishing jetty under certain circumstances, including during high winds that might topple containers stacked on nearby Boiler Point, a release of hazardous substances, or if there is a security threat to either the port or vessels.

[230] Mr Coe reiterated that, at present, there are no viable alternative to the disposal of spoil at sea although POL would keep an open mind regarding other options.

[231] A Technical Group is to be formed, and its inclusion within the procedures for the EMP, would provide openness and transparency to the monitoring, review and updating of the plan. This would greatly expedite any action needed to minimise any adverse effects should they arise. The proposed group would be modelled on an existing and similar group that has been operating for 9 years in relation to the existing spoil sites. In Mr Coe's view, the key to the success of the group is to ensure it has the expertise to be able to make informed decisions. POL believes it is appropriate to include Ōtākou Rūnanga, Puketeraki Rūnanga, Department of Conservation and Otago Regional Council, as part of the group's membership.

[232] Mr Coe acknowledged that there would be some cross-over and duplication in the roles of the Technical Group and the Manawhenua Consultative Group but it is POL's view that it is important to have a group that deals specifically with iwi matters. As the project progresses, the two groups would develop their own identities, thereby providing different forums for different issues.

Mr Andersen

[233] We return now to Mr Andersen. In his opening remarks he emphasized that PNG is important to both the port company and the wider community. It is also fundamental to POL's interests that the project is managed to avoid adverse effects and this is supported by the proposed conditions and the Environmental Management Plan (**EMP**) that have been offered. In addition, the partnerships that have been forged with Manawhenua and DOC underlie this long-term commitment.

[234] Prior to referring to the detail in his right of reply, Mr Andersen gave his perspective on the issue we had previously raised with respect to the need or otherwise for consents for the

operational activities on the Multi-purpose Wharf and fishing jetty under s. 12(3) RMA. Mr Andersen's view was that consents were not required under s.12(3) RMA as he considered that this provision was permissive and that any port activity could be undertaken on the wharves as of right. We discuss this matter further in our consideration of port operational effects on amenity values in Section 6.7.

[235] With respect to dredging in the harbour, Mr Andersen said that the conditions and the adaptive management provisions of the EMP would ensure that sediment levels in the sensitive areas of the harbour would not exceed levels likely to cause environment harm. In referring to the submission by SCL, he said that the concerns raised about the effects on cockle beds would be met. As the POL's goal was to do the dredging as efficiently as possible it was, therefore, in its interests to ensure that there was no downtime and, therefore, it was very important that sediment discharges are minimised so as to comply with conditions of consent.

[236] Mr Andersen reiterated that, because of the volume of material to be dredged and the lack of any alternatives to its disposal, dumping at sea is the only practical option.

[237] In mentioning that there have been suggestions during the hearing of using some of the dredge spoil to form artificial islands in the harbour, Mr Andersen noted this is not an option at this time. Resource consent for this would be required and he drew attention to the opposition expressed by Ōtākou Rūnanga.

[238] Mr Andersen reminded us that the A0 site had been chosen after much investigation by experts of a number of parameters including avoiding significant effects on fishing and aquaculture. In support of this, he drew attention to Mr Boyd's evidence, regarding the effects on fishing, stating that the dumping would be minor and of limited duration as the area involved is small compared to the overall distribution of the fishery. In commenting on the submissions from commercial fishers, Mr Andersen noted that they did not offer any probative evidence that might have negated against the A0 site.

[239] Any unforeseen effects, which were a concern expressed by many submitters, would be dealt with by the adaptive management provisions in the EMP, as well as the Technical Group ensuring that all data related to the project is disseminated. He referred us to DOC's conclusion that a robust and independent monitoring regime would address a number of the Director General's concerns, particularly those relating to unknown adverse effects.

[240] With respect to the existing disposal sites, Mr Andersen stated that there were only two issues: the disposal of rock at Heyward Point, and permitting Incremental Capital Dredging as

opposed to maintenance dredging. With regard to the latter, the critical factor was the composition of the dredged material and this was protected by a 90% sand requirement.

[241] Mr Andersen said that most of the noise emanating from the port is unavoidable and is a necessary part of port operations. He said the issue of noise was faced at hearings over the noise provisions in the Dunedin City District Plan, which resulted in a decision of the Environment Court in 2004. This provided a regime that allowed the port to function, including the possibility that noise levels may increase above what were then current, while providing a reasonable degree of compensation to the residents adjacent to the port. In adopting the noise regime, POL accepted responsibility for all noise emanating from the port even though it might not be directly responsible for it as, for example, noise from ship engines. POL also agreed to monitor noise, and implement mitigation measures. Finally, POL accepted community involvement in setting priorities for noise mitigation.

[242] Mr Andersen went on to say that the noise model has been both verified by Mr Ballagh and peer reviewed by a specialist acoustic consultant, Mr Nevil Hegley. The ability to have L_{eq} readings provides protection for property owners. Mr Andersen reconfirmed that the port company is committed to implementing the Dunedin City District Plan and that this is the proper mechanism for dealing with noise arising from the port's operations. He noted that Mr Freeland, in his evidence presented on behalf of DCC, did not seek any conditions on noise but instead asked that an advice note referring to the plan be added to the consent.

[243] On the matter of containers on Boiler Point, Mr Andersen noted that the Careys Bay Association had been unsuccessful in its attempt to prevent POL stacking empty containers up to five high at the port. The existing measures are to ensure that empty containers did not stay on the point but are constantly being moved.

[244] As for the erosion at Te Rauone Beach, POL's position is that it is not appropriate or necessary that there be any conditions specific to this as the matter will be dealt with as a separate resource consent application.

[245] Mr Andersen then referred to the various provisions of the Act relevant to this application, including those relating to decant water, disposal of spoil, temporary discharges and mixing zones. We shall refer to this later when we come to consider statutory matters in Section 8.

[246] According to Mr Andersen's interpretation of the Fisheries Act (1996) with respect to the removal of cockles, doing so as a consequence of dredging does not constitute "fishing" as

defined in the Act. Consequently, there are no quota issues as was suggested by some submitters.

[247] In response to Professor Barker's submission, POL does not see the necessity to monitor both Quarantine Island and Pudding Rock. He said Incremental Capital Dredging is expected to have the same effects as the existing permitted activity, which is why the 3-year biological monitoring programme is proposed and that the adaptive management provisions of the EMP are designed to identify and respond to actual concerns. The EMP would also provide the community with ongoing access to information as well as ongoing input.

[248] Mr Andersen closed by saying that the evidence presented by POL demonstrated that the proposal would promote the purposes of the Act and ensure that adverse effects on the environment would be appropriately avoided, remediated or mitigated.

5 PLANNING REPORT

5.1 Otago Regional Council s.42A Planning Report

[249] The s.42A Planning Report (s.42A Report) was prepared by two Otago Regional Council Officers; **Mr Peter Christophers** (Principal Resource Officer) and **Ms Suzanne Watt** (Senior Resource Officer). Mr Christophers was unable to attend the hearing. However Ms Watt attended the entire hearing and provided a helpful commentary on the Planning Report's conclusions and recommendations following her consideration of the applicant's and submitters' evidence presented at the hearing.

[250] As stated, the purpose of the s.42A Report is to report and make recommendations on the determination of various resource consent applications under the notified provisions, s.95A(2)(a) and s.95A(2)(c) and s.127 of the Act. The s.42A Report provides a useful introduction to the applications. It sets out the resource consents being sought and lists the reports prepared on behalf of, and provided by the applicant at the time the application was lodged.

[251] The s.42A Report highlights, at [12], a Council-initiated peer review of the Harbour and Offshore Modelling Report, provided as part of the application, by Dr Ross Vennell (Department of Marine Science, University of Otago).

[252] The Planning Report also provided a detailed overview of the proposed works, an assessment of the activity status and a brief comment on the consent term and lapsing periods

sought by POL. Furthermore, the report provided a description of the environmental setting of Otago Harbour and the offshore area relevant to the proposal. The notification process is described at Para 258, followed by a summary analysis of the submissions received.

[253] Section 7 of the s.42A Report provides a commentary on the assessment of environmental effects. This analysis considers the effects of the different parts of the proposal:

a) Channel enhancement

b) Sediment disposal

c) Multi-purpose wharf extension

d) Fishing jetty.

e) Variation of Coastal Permit 2000.472

We shall refer to these in more detail later in Section 6 of this report.

[254] Section 8 of the s.42A Report provides guidance on the statutory considerations to be made, as set out in s.104 of the Act. Subject to Part 2, and having had regard to any actual and potential effects on the environment, the report considers the following documents to be relevant:

a) New Zealand Coastal Policy Statement (2010)

b) Regional Policy Statement for Otago

c) Regional Plan: Coast for Otago

[255] Furthermore, because of concerns raised by a submitter, the London Convention and the New Zealand Guidelines for Sea Disposal of Waste (**NZGSDW**) were identified in the s.42A Report as other matters considered relevant and reasonably necessary to determine the application (s.104(1)(c) of the Act).

[256] At the time of writing the s.42A Report, the authors recommended granting the applications subject to a suite of draft conditions attached to the report. The reasons given for the recommendation were that, subject to the draft conditions, it was expected that the adverse effects of the proposal on the environment would be minor, and the proposed activity is consistent with the requirements of the Act and ORC's objectives and policies.

[257] Towards the end of the hearing, and having heard the applicant's and submitters' evidence, Ms Watt, a co-author of the s.42A Report, provided a very useful discussion of a number of points that had been raised through the course of the hearing. Furthermore, Ms Watt provided an updated set of draft proposed conditions, revised in light of matters raised during the hearing. A fundamental part of the proposed conditions is the development and

implementation of an adaptive EMP that requires monitoring the effects of the activities and making any necessary changes in order to minimise adverse effects.

[258] Having considered the applicant's and submitters' evidence, Ms Watt still held that, subject to her revised proposed draft conditions, the consents should be granted.

[259] A question was raised during the hearing as to whether or not consent was required under s.12(3) of the Act for activities within the CMA on the proposed wharf extension and fishing jetty, as distinct from the right to occupy required under s.12(2) of the Act. The reporting officers' view was that no further consents were required for these activities. This view was supported by a legal opinion sought from the Council's legal advisors. We refer to this later in Section 6.7 when we come to discuss the effects of port operations on amenity values.

6 PRINCIPAL ISSUES AND EFFECTS

6.1 Introduction

[260] This section considers the principal issues and effects relevant to this proposal. Because of the effects-based nature of the Resource Management Act 1991 (the Act), we shall review the effects of the works in total on a range of relevant matters, largely as identified in the Fourth Schedule of the Act. This approach is consistent with s.104 of the Act.

[261] In carrying out our assessment, we have reviewed the submissions and evidence concerning each of the principal issues and the effects on the environment that were brought to our attention. While we have not repeated everything we heard, we have endeavoured to record here the more important aspects of the evidence presented to us on behalf of the applicant and from submitters, as well as from the council officer from ORC. At the conclusion of our discussion of each issue we provide our findings with respect to that issue. This, in due course, provides the basis for our decision and, in terms of our duties under the Act, this section is also consistent with s.113 of the Act.

[262] Included with the application were many technical reports prepared on behalf of POL for the Assessment of Environmental Effects (**AEE**), and these formed part of the application. These reports are a matter of record and were also listed in the s.42A Report. We do not propose to repeat that list here but, where necessary, we shall refer to the technical reports in the following discussion of issues and effects. Some, but not all, of the authors presented evidence on behalf of POL during the hearing.

6.2 Tangata whenua

[263] *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga* are recognized in the Act as matters of national importance that we are required to recognize and provide for (the Act s.6(e)) as is the *protection of recognised customary activities* (s.6(g)). Furthermore, *kaitiakitanga* (s.7(a)) and the ethic of stewardship (s.7(aa)) are matters to which we are required to have particular regard, and we are also required to take into account the principles of the Treaty of Waitangi, *Te Tiriti o Waitangi* (s.8).

[264] At the hearing Mr Andersen, on behalf of POL, acknowledged that the harbour and coastline have significant cultural and spiritual meaning for tangata whenua and this recognition had been demonstrated by POL commissioning a cultural impact assessment report (**CIA**). He stated that POL has engaged in productive consultation with tanagata whenua and gave an undertaking that there would be ongoing collaborative engagement through the establishment of a Manawhenua Consultative Group.

[265] From the submissions we heard, particularly those presented on the Ōtākou Marae, we are satisfied that Kai Kahu has a long association with the harbour that is ancient, mythological, traditional, historical and spiritual.

[266] We also recognise that there have been great changes on Otago Peninsula and to Otago Harbour over the past 150 years. As Mr Edward Ellison eloquently stated in his submission, his people have, either unwittingly unwillingly or willingly, sacrificed much during that time. The development of Port Otago has undoubtedly been instrumental in changing the harbour from one with large areas of tidal flats and few channels to one with a large deep channel extending from Dunedin to the ocean.

[267] Nevertheless, a number of submissions also drew attention to the good relationship between Kāti Huirapa Rūnaka ki Puketeraki and Port Otago Ltd.

[268] Despite changes, the harbour and adjacent coastal waters remain of considerable importance as a source of food, and the cockle beds within the harbour are a great source of satisfaction to tangata whenua.

[269] All of the submitters on the Ōtākou Marae expressed reservations about the proposal citing uncertainties in its outcomes, a lack of confidence in the scientific predictions of POL's witnesses, the potential of increased harbour erosion, and the risk to food resources from suspended sediments both, in the harbour as a direct result of dredging, and from the winnowing of fine sediments from the spoil sites.

[270] While one submitter stated that his preference was for the proposal to not proceed, there was no total opposition although there were several objections to dumping at sea.

[271] Mr David Ellison, in speaking to the submission of the East Otago Taiāpure Management Committee, felt that alternatives to disposal at sea should be investigated more broadly and suggested that sand could be shipped to islands in the Pacific. Mr Edward Ellison stated that he was not in favour of further reclamations in the harbour and, consequently, this would not, as far as he was concerned, be an option for the disposal of some of the dredgings, particularly those relatively rich in silt and clay.

[272] The s.42A Report referred to the concerns that had been raised by iwi and pointed out that a CIA had been prepared. The s.42A Report also noted the CIA had concluded that monitoring and a flexible dredging programme would be required to ensure that Otago Harbour and Te Tai o Arai Te Uru is healthy and would continue to support Kai Tahu ki Otago customs. Specifically, monitoring of the effects of dredging on key species and ecosystems of importance to Kai Tahu, including tuaki, flat fish, seagrass and kelp were recommended. These recommendations have been addressed through the requirements of the EMP to adaptively manage the actual or potential effects on aquatic communities.

[273] We are satisfied that we have properly considered the effects of the proposal on tangata whenua in terms of the requirements of Part 2 of the Act and the various statutory planning documents, as they apply to Maori. Provided strict monitoring conditions and an environmental management plan are in place, and that tangata whenua are kept fully informed with ongoing input into the plan, we are satisfied that iwi concerns can be met and that the culture and traditions of Maori would not be adversely affected by the proposal by more than a minor extent.

6.3 Hydrodynamics and sediment processes

[274] Hydrodynamics and sediment processes (movement of water and sediment), in the context of this application, is concerned with understanding what effects the proposed dredging in the port area and the harbour channel, and disposal of the dredged material off-shore, might have on the flow of water into and out of the harbour and the impacts that any changes in these flows may have on sediment processes, and also the movement of sediment following disposal offshore. Sediment processes, in this case, means the movement of sediment both on the seabed and throughout the water column. These were significant issues in the minds of many submitters, particularly with respect to the potential effects on the benthic ecology of both the

Lower Harbour and Blueskin Bay, and also, among the surfing fraternity, the effect that further sediment disposal offshore might have on the recognised surf breaks off Aramoana.

[275] Evidence, on behalf of POL, on hydrodynamics and sediment processes was principally provided by **Dr Robert Bell** and **Dr Martin Single**.

[276] We turn first to Dr Bell who provided evidence on the hydrodynamic and physical suspended-sediment effects of the proposal for both the Major Capital Dredging using a moderate-size TSHD, and the Incremental Capital Dredging using the "New Era" or similar dredge. In doing so, among other things, Dr Bell considered the effects of the completed dredging works on tides and currents in the harbour, and sediment plume dispersion both from dredging activities in the harbour and offshore at the spoil disposal site, A0. He also considered the effects of disposal at A0 on wave heights offshore. We discuss this evidence in some detail because much of the evidence concerning other matters, such as the effects on ecology, depended on Dr Bell's findings.

The physical environment

[277] Dr Bell first described the physical environment. Otago Harbour covers 4600 ha and stretches 21 km along a south-west/north-east orientation. Port Chalmers is located near the middle of the harbour close to Goat Island and Quarantine Island, which partially separate the Upper and Lower Harbours. These features are shown on Figure 1 included in Appendix 1.

[278] The tidal range at Port Chalmers varies from 1.2 metres on a neap tide to 2.0 metres on a spring tide. Currents in the harbour are dominated by tidal flow, with some variability due to winds. Channel currents in the Harington Bend area reach 0.8 to 1.3 metres/second (1.5–2.5 knots) on a spring tide, and similarly peak at 1.0 to 1.1 metres/second (2.0–2.2 knots) off Port Chalmers. Waves in the harbour are fetch-limited and are affected by intertidal banks that emerge at lower tide levels. Significant wave heights could reach 1.2 metres in the Lower Harbour and wave periods are generally in the range of 2-5 seconds.

[279] Outside the harbour entrance the key sand bodies are the ebb-tide sand bar on the eastern side of the approach channel off Taiaroa Head and a northerly-aligned submergent sand spit offshore in 27–30 metres water depth that swings out from Cape Saunders with its terminus 11 km due east of Karitane Point. The offshore underwater sand spit is fed by sands from the Clutha and Taieri Rivers, whereas silt from these rivers is dispersed widely along the coast and over the shelf. The proposed disposal area of 2 km diameter, centred on A0, has been positioned to be on the offshore submergent spit, which is subject to a net northerly transport regime.

[280] Dr Bell described in some detail the complex pattern of residual currents on the shelf at the proposed disposal site A0 and also the so-called Blueskin Bay eddy (referred to by some as the gyre). Offshore modelling of currents was undertaken in late 2008 using a 3-dimensional (3-layer) finite-element model (DHI MIKE-3 FM) of the Otago Shelf. Details of the modelling were provided the 2009 Modelling Report (Technical Report 10 with the application documents).

[281] POL engaged Tonkin & Taylor Limited (**T & T**) to carry out an independent peer review of the Modelling Report. T & T assessed the modelling as being robust and fit-for-purpose with no further studies necessary.

[282] At the request of ORC, a further independent peer review of the 2009 Modelling Report was undertaken by Dr Ross Vennell of the Department of Marine Sciences, Otago University. Dr Vennell made several observations:

a) The 3-D modelling did not include the effects of water density, but he concluded that this was reasonable.

b) The Southland Current was kept constant in the 3-D offshore model. Dr Vennell questioned what effects a variable current would have on the results.

c) The offshore model didn't include Otago Harbour although he felt this was reasonable.

d) The very good comparison of modelled currents and field measurements at site A1 was noted.

e) No current measurements had been undertaken at the proposed disposal site A0 and he suggested that direct measurements at A0 would increase confidence in the model.

[283] As a result of Dr Vennell's last comment, POL commissioned current studies at the A0 site. The results were documented in a report by MetOcean Solutions Ltd. (2011). Among other things, this study showed that the mean Southland Current of 0.15 metres/second used for the A0 plume modelling is towards the lower end of the speed range. According to Dr Bell, further modelling diagnostics carried out by his colleagues at NIWA showed that using the lower mean velocity tends to overestimate any coastline effects and, thus, is conservative.

[284] Dr Bell also considered the offshore wave climate. Based on a 10-year wave hindcast (1998 to 2007) undertaken by MetOcean Solutions (2009 Modelling Report), the average

significant wave height[4] offshore in 30 metres water depth is 1.1 metres, rising seasonally to 1.2 metres in winter months. For waves less than 1 metre high, a wide range of wave periods occurs from 3 to 15 seconds, exhibiting local sea or swell or a combination. Wave heights over 2 metres are generally swell waves from the south-east quadrant with periods of 9 to 15 seconds.

[285] From these results it can be deduced that, in the depth of water at the A0 site (30 metres), waves are capable of mobilising fine sands of 0.1 mm diameter for 55% of the time on an annual basis. Mostly, this is achieved by waves from the easterly and south-south-east directions. Seasonally, winter swells and sea conditions produce the most active mobilisation 68% of the time, reducing to 42% during summer months.

[286] At the disposal site A0, net transport of sediments winnowed from the seabed under wave action will predominantly move to the north, north-east or east until sediment particles settle again. Given the low occurrence of onshore-directed currents, there is no effective mechanism present for onshore movement of re-suspended sediments, as onshore-directed waves and swell alone will not result in any net shoreward sediment transport in deeper water.

Selection of disposal site A0: hydrodynamic factors

[287] As described in the evidence of Mr Coe, a site at A1 was initially selected for the disposal area. However, after undertaking field measurements and some preliminary plume-model simulations, it became clear that sediment plumes could regularly encroach on the coastline of Otago Heads. Modelled currents at the second alternative site, A2, 1.8 nautical miles north of A0 were similar to those at the A0 site. Preliminary plume-model simulations for disposal at A2 resulted in no contact with the coastline around Otago Heads, but increased suspended-sediment concentrations somewhat more along the coastal zone north of Cornish Head.

[288] At disposal site A0, plume simulations showed that the very-dilute edge of the plume would produce somewhat lower concentrations along the northern coastline than those for a site at A2. Dr Bell said, in terms of hydrodynamic and plume dispersion processes, A0 is the optimal location among the disposal sites investigated from the point of view of plume behaviour.

[4] The "significant wave height" is a precise term used in wave applications to define the average of the highest 1/3 waves over a measurement period.

Effects of capital dredging in Otago Harbour

[289] Dr Bell told us that deepening and widening the harbour channel would only have a minor (<1%) effect on the tidal volume (tidal compartment) flowing in and out of Otago Harbour, as most of the volume change in the harbour would occur below low tide. Furthermore, changes to the tidal range after capital dredging is complete would be negligible at the harbour entrance and only minor elsewhere, with increases of no more than 6–8 mm for an average tide. These changes, he said, would be barely discernible.

[290] Overall, there would be only minor changes of generally less than 0.1 metres/second (0.2 knot) in the speeds of tidal currents following capital dredging—mainly reductions rather than increases in speed, and largely within the Lower Harbour. Most of the predicted changes in current speed outside the shipping channel would be close to or below the accuracy that can be achieved by conventional current meters (between 0.01 to 0.03 metres/second) and, according to Dr Bell, are of no practical significance.

[291] It is acknowledged that dredging causes "extra turbidity" in the waters in which a dredge operates, arising from seabed disturbance from the suction head and from near-surface discharges once the hopper overflows. The effects of dredging operations using either a moderate-size TSHD or "New Era" within the harbour were assessed on the basis of sediment plume modelling for 14-day scenarios from five representative dredging sites in the shipping channel.

[292] The modelling showed that, for a moderate-size TSHD undertaking major capital dredging on a 24/7 operation, the 14-day average suspended-sediment concentration in the fairway would reach 100–500 mg/L above the background concentration, with small patches from 500–1000 mg/L in the vicinity of the dredging. Dredging simulations for the "New Era" undertaking incremental dredging, also on a 24/7 basis, showed that 14-day average suspended-sediment concentration in the fairway would only reach 20–50 mg/L above the background concentration, with small patches from 50–100 mg/L in the vicinity of the dredging. Dr Bell noted that these latter values predicted by the model match well with the results from a small-scale field test, undertaken by POL staff, sampling surface waters in and out of the sediment plume from the "New Era" while dredging on 29 April 2008.

[293] Dr Bell went on to say that direct seabed deposition of silt-size sediments over a 14-day neap/spring tide cycle with varying winds was also simulated for both the moderate-size TSHD and the smaller "New Era". It was found that for both Major Capital and Incremental Capital Dredging, sediment deposition in the harbour (excluding the deeper main channels) would be highest on the central intertidal bank that is both opposite Port Chalmers and north of

Quarantine Island. Discharges from predominantly-silt dredging would cause slightly higher deposition thicknesses and rates of deposition than from predominantly-sand sources, but the overall spatial distribution of affected areas is similar for either type of seabed composition.

[294] For Major Capital Dredging, 99% of the harbour area outside the main channels would experience deposition rates of no more than approximately 1 mm/day, being highest on the intertidal banks opposite Port Chalmers, but most of these harbour areas would be subject to less than 0.1 mm/day. Most of the eastern parts of the Lower and Upper Harbour would be subject to little or no deposition.

[295] The mid-harbour intertidal flats, where most of the non-channel deposition would occur, would experience sedimentation rates of 0.1–0.3 mm/day for the moderate-size TSHD. Using the "New Era" for Incremental Dredging, the expected sedimentation rates would be one-tenth as much at 0.01–0.03 mm/day because of the slower rate of dredging. Dr Bell found that the final thickness of silt deposited from the dredging operations would be no more than several millimetres built up over a finite period of months to years.

[296] Dr Bell then turned to dispersion of the plume from the disposal of dredged material at the A0 site. This was a matter of concern to many submitters. It is proposed that all the dredged material from the Major Capital Dredging programme, and the majority of the material from Incremental Capital Dredging would be released offshore at A0.

[297] To simulate sediment plumes from cyclic hopper releases at A0, a more conservative passive particle-tracking plume model, MIKE-3 FM PT, was adopted, rather than a dynamic plume model. Sediment plume modelling was undertaken using 2-day scenarios for disposal at five evenly-spaced sub-sites within the 2-kilometre diameter A0 area. Scenarios for simulating suspended-sediment concentrations in the water column included both, an average mix of silts and sands discharged from a dredge hopper, and also predominantly-silt discharges. Four classes of sediment were modelled, ranging from fine silt to fine sand. Details of the modelling set-up and the parameters adopted were provided in the 2009 Modelling Report (Technical Report 10, with the application documents).

[298] The results showed that for a moderate-size TSHD, considering all silt-size classes in the vicinity of A0, a moderate (14 metre/second) WSW wind would generate the most adverse conditions for sediment concentrations in the bottom layer. Across all silt-size classes and a predominantly-silt hopper load, maximum suspended-sediment concentrations for this scenario could reach around 900 mg/L above background levels just downstream of the disposal area. For an average sand/silt hopper load, the maximum concentration for all silt size classes would be about 30% less at around 620 mg/L. Out of the 6 wind scenarios, the highest surface-layer

concentrations for all silt-size classes, would occur during light (3 metres/second) NNE winds with a maximum concentration of around 270 mg/L above background, and about 30% less at 185 mg/L for an average sand/silt hopper load.

[299] Using the "New Era" dredge, the suspended-sediment concentrations for predominantly-silt loads are predicted to be considerably less at around 7–11 mg/L and 47–57 mg/L above background levels, in the near-surface and bottom ocean layers respectively. For an average sand/silt hopper load, peak concentrations would be similarly between 23–33% less than for predominantly-silt hopper loads.

[300] Further afield, the fringes of sediment plumes generated during disposal may sometimes, in theory at least, reach the coastline north of Karitane and around Otago Heads (See Figure 2 in Appendix 1) but, in practice, the suspended-sediment concentrations of silts will be very small. For the coastline north of Karitane, particularly north of Cornish Head, maximum concentrations in the dilute edge of the plume from predominantly-silt loads would not be elevated above background levels by more than about 0.9 mg/L for a mid-size TSHD under light NNE winds.

[301] Under light NNE or WSW winds, the dilute fringe of sediment plumes may also reach Otago Heads, in theory, where the maximum concentrations for silts would be no more than 2–3 mg/L above background levels for a moderate-size TSHD, and 0.6 mg/L for the "New Era".

[302] According to Dr Bell, these coastline concentrations are so small, they would be difficult to detect in the field and, in effect, are an artefact from modelling a continuum down to infinitesimally small concentrations.

[303] In his discussion of seabed deposition from the sediment plumes offshore, Dr Bell said that conservative estimates of seabed deposition of silt and sand on the continental shelf were determined for the moderate-size TSHD in the 2009 Modelling Report. A worst case scenario was assumed where a moderate-size TSHD undertakes all the capital dredging works and a conservative assumption was made in that it was assumed that sediments remain on the seabed where they first settle out of suspension and are not subsequently re-suspended by waves or currents. In fact sediments would be actively re-suspended.

[304] A map provided in Dr Bell's evidence[5] shows the upper-bound rates for sediment deposition. The map has been included in Appendix 1 as Figure 3.

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[5] Figure 7 in Dr Bell's evidence.

[305] Dr Bell said that, in the longer term, silts derived from the dredge disposal operation may mostly end up in very thin layers across the shelf and ultimately in the large canyons that dissect the continental slope further offshore, along with the ongoing quantities of terrigenous sediments from rivers. He considered that the Blueskin Bay eddy (gyre) would sweep only a small proportion of the dredged silt material over the patch of surficial sediments with a higher silt content in the centre of Blueskin Bay. In his opinion, the deposition thickness of silt sourced from disposal at A0 in Blueskin Bay would be small.

[306] Dr Bell then referred us to the long-term evolution of the disposal mound at A0. He said, within the disposal area at A0, a mound would form that is estimated to be between 1.1 to 1.7 metres above the existing bed level using a moderate-size TSHD. A lower mound would result if the "New Era" or similar dredge was used over several years. Modelling showed that the long-term sand transport from the A0 disposal area would predominantly be to the north or NNE, generally following the orientation of the submergent Peninsula Spit. The mound is expected to take many decades to diminish and blend in with the local topography. Dr Bell considered that it is very unlikely that fine sands from the dredged material at A0 would reach the Otago coastline in any discernable quantities.

[307] The effect of the disposal mound at the A0 site was a matter of considerable concern, particularly to those submitters who enjoy the well-recognised surf breaks at Aramoana and nearby. Dr Bell said that the presence of a physical mound of up to 1.7 metres above the existing bed level at the A0 disposal ground in 27 to 28 metres water depth has the potential for small changes in wave patterns to occur.

[308] Wave modelling was undertaken[6] to determine the effects of such a seabed mound on wave patterns for two alternative disposal areas at A1 and A2, which bracket A0. This showed that the mound at the A2 site, which would more closely mimic wave conditions and depths at A0, would have no discernable effect on wave patterns for mean wave heights. But for maximum significant wave heights of around 6 metres, localised decreases of around 0.05 metres in height on the north-west side of the mound, and increases of a similar magnitude to the north and west of the final mound, may occur, gradually decreasing with time as the mound deflates. These minor effects on wave heights would be very similar to those experienced following disposal at A0, as it is on the same submergent spit and has similar depths to A2.

[6] MetOcean Solutions Ltd. Refer to Figures 8.9 and 8.10 in the 2009 Modelling Report

[309] Dr Bell then moved on to discuss conditions with respect to monitoring and the EMP. We shall consider what he had to say when we come decide on conditions in the event that we are minded to grant consent.

[310] We now turn to discuss the evidence of Dr Single on behalf of POL. His evidence focused on coastal processes and the effects of wake from vessels using the deeper channel. Dr Single described the physical coastal environment of Otago Harbour and Blueskin Bay in some detail. Much of this is a matter of record and we shall not repeat here everything he said.

[311] Dr Single noted that, in 1986, Dr L. Carter[7] produced a sediment budget for the coast south of Otago Peninsula to Nugget Point. From this budget, Carter showed that the dominant source for the modern sediment (younger than 6,500 years) is the Clutha River, which delivers in the order of 3.14 million tonnes of sediment to this coastal system each year. Carter proposed that, of this material, approximately half is stored within the large nearshore sand-wedge (the Peninsula Spit), with approximately 1.1 million tonnes per year transported north under the influence of wave processes and nearshore currents. The spit is approximately 25 km long, tapering from 3 to 4 km width where it abuts the northern shore of Cape Saunders, and fades out northwards on the mid-shelf off Karitane.

[312] Dr Single described the wave climate within Blueskin Bay as a low energy coastal environment that experiences periodic high-energy storm waves propagating from the south.

[313] The northward current that moves up the East Coast of the South Island is well-known. Also well-recognised is the disruption that Otago Peninsula has on this current by forcing an anti-clockwise 'eddy' or gyre to form in its lee. This gyre, when considered together with the wind and wave processes has a direct effect on nearshore processes within the lee of Otago Peninsula in Blueskin Bay. Dr Single noted that the nearshore processes of Blueskin Bay are predominantly low energy with respect to the outer Otago shelf. As a result the bay is a depositional environment, acting as a re-entry trap to catch the northeast sediment drift along the Otago shelf. Once within the coastal system of Blueskin Bay, the sands are reworked by a variety of local processes and transported into the smaller bays and onto the beaches.

[314] The coastline north of Otago Peninsula displays active and rapid progradation. Superimposed on this long-term trend are short-term periods of erosion and deposition, a feature that is typical of sand beaches. In some cases, at Purakanui for example, where the Spit

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[7] Carter L (1986): A budget for modern-Holocene sediment on the South Otago continental shelf. *New Zealand Journal of Marine and Freshwater Research* 20: 665-676.

has moved seaward some 360 metres (between 1863 and 1997) at a rate of about 2.7 metres/year, the accretion has been substantial.

[315] Dr Single noted that human activities have modified the offshore physical coastal environment and the approaches to Otago Harbour in three main ways:

a) by modification of the harbour inlet form and stability through construction of the Mole and the Long Mac wall, and by dredging of the harbour channel;

b) by disposal of dredged sediment at the Heyward and Spit sites; and

c) by disposal of dredged sediment at Shelly Beach.

[316] Between 1846 and 1994, shoreline position and sediment transport at Aramoana was significantly altered by coastal engineering structures. Progradation of Aramoana Beach after the Mole construction (from 1884) indicates sediment has accumulated on the updrift side. The beach area between the Mole and Harington Point (Shelly, or Spit Beach) retreated rapidly after the construction of the Mole, indicating that the beach is on the downdrift side of the Mole and starved of sediment. The position of the channel has remained effectively fixed because of the training works.

[317] Dr Single provided a summary of the history of dredge disposal at the various sites off the entrance to Otago Harbour. He also described the sediments in the lower harbour and the geotechnical investigations carried out by Opus International Consultants[8]. The Opus report provided a geological description based on logging of cores received from 43 locations along the channel. Dr Single made the following observations:

a) Sand is most commonly encountered in the channel sections near the entrance to the Harbour and beyond, namely from the Harington Bend to the Entrance sections.

b) Clayey silt is most prominent from the Swinging Basin to the Cross Channel sections. The behaviour of this material is dominated by the high silt content.

c) Silty clay was the least common sediment type encountered and is most prominent in the area around Acheron Head.

d) Rock was only encountered at Rocky Point and Acheron Head, and consisted of completely weathered basalt (cobbles and boulders) near the seabed and moderately weathered basalt at depth.

[8] Opus International Consultants (2008): *Factual report of geotechnical investigations: Port Otago–Project Next Generation*. Opus International Consultants Ltd client report #1230, prepared by Shane Greene for Port Otago Ltd. August 2008. 9 p. + appendices.

[318] Dr Single also referred to work he had carried out to describe the coastal process environment and shoreline changes at Te Rauone. This was a matter of concern to several submitters from the area. Dr Single said shoreline changes at Te Rauone, are a result of changes to sediment supply due to the modification of the harbour entrance, the addition of ad-hoc human modifications to the shoreline in front of private property, the natural wave environment and, to a lesser extent vessel wash at the shore. He told us he had also identified options for coastal management for the area. These include engineering works and artificial beach nourishment and include consideration of the effects of wake and surge conditions that result from shipping movements in the harbour channel as well as the natural wave environment and sediment loss and supply. This, we were told, is to be the subject of a separate consent application.

[319] Dr Single then discussed the changes to the physical coastal environment due to the proposed dredging activity, disposal of dredged sediment and the deeper shipping channel in Otago Harbour. He said that the design of the channel sides and batter slopes replicates the existing slopes to minimise adjustment of the channel and margins after the capital dredging programme is complete and he would not expect there to be any increased sedimentation arising from scouring of the channel margins or from erosion of the intertidal banks. Dr Single also determined that sediment would not move from the A0 disposal site back towards the harbour entrance.

[320] In considering the effects of wake from larger vessels using the deepened channel, Dr Single used an approach consistent with international practice, for example guidelines from the International Navigation Congress (PIANC), and the requirements of the Act and NZCPS (2010). He found that the increase in vessel size and changes to the harbour bathymetry are likely to result in changes to the vessel generated waves associated with ship passage along the channel. The potential environmental effects include those resulting from waves generated by vessels such as wake and Bernoulli waves, seabed scour and any potential safety impacts. However the size and effects of the wake waves is dependent on a large number of variables such as vessel speed, length, climatic conditions and water depth.

[321] The area potentially affected by waves associated with the movement of larger vessels along the deepened channel is limited to the channel seaward of the entry point of the vessel to Harington Bend. Dr Single said any effects are likely to occur within 500 metres of the channel. The potential effects of wake waves through the entrance channel to Harington Bend, and at Te Rauone Beach, were examined in more detail as these areas exhibit greater sensitivity to environmental and climatic change, as well as being closer to the channel in an area of higher

vessel speed. Of the large wakes events observed, 37% came from the 4100 TEU Container ships, while 51% of large wake events came from smaller container vessels.

[322] Dr Single said a two-month visual observation programme, beginning 17th August 2009, was carried out to provide further background information on vessel-generated effects away from the shipping channel, and at the shore. It was found that there was no clear relationship between vessel speed and wake height for the data set. However, there were six occasions when the wake reached and disturbed the dune face at Te Rauone Beach.

[323] From studies carried out as part of a channel deepening project at the Port of Melbourne, it was concluded that a deeper draft (14 m) vessel in the proposed channel would create waves that are approximately 5-10% smaller than the present 12.1 metre draft vessels in the existing channel. The reasons for this are due to the increased water depth and cross sectional area of the new channel being the dominant factor rather than the deeper vessel draft. It is expected that the wake and wave effects of all existing vessels using the proposed deeper channel in Otago Harbour would be reduced.

[324] Notwithstanding the Port of Melbourne studies, Dr Single expects an increase in the order of 10 to 15% from the current observed wake heights from the 4100 TEU vessels to that produced by the passage of 6000 TEU vessels under similar conditions. Such an increase, he said, was well within the natural variability of the existing wave environment. In his opinion, the utilisation of the deepened shipping channel by larger vessels would have effects that are little different to those that exist at present. Furthermore, the minor changes expected in the magnitude of the wake waves from larger vessels using the deeper channel are not likely to have any additional effect on the sandbanks or channel sides.

[325] Dr Single went on to say that, while ship wake cannot be eliminated, proper management measures can improve safety by increasing community awareness and bringing notice of the effects of vessel traffic to users of the harbour, even though most of these effects are likely to be reduced.

[326] Dr Single then discussed the effects of the proposal on the beaches and shorelines of Otago Harbour and Blueskin Bay. He said the location of the A0 disposal site is such that the beaches of Blueskin Bay, and the rocky shoreline south of Taiaroa Head and north of Warrington, would not receive any appreciable amounts of fine sediment during the dredge disposal operation at site A0, or from sediment re-suspended at the disposal site.

[327] After referring to matters raised by submitters and making several recommendations with respect to monitoring, Dr Single, in his concluding remarks, said apart from the physical

change to the seabed topography, in and along the margins of the channel and at the disposal site, he considered the effects of the dredging operation on the physical coastal environment would be minor.

[328] Many submitters raised concerns about the effects of the proposal on hydrodynamics and coastal processes. Mostly, these related in some way to the reliability of the modelling that had been carried out with respect to the movement of sediment and the effects of sediment disposal on waves. Generally, we have summarised submitter concerns in Section 4.3. More specifically, these included concerns about:

a) the parameters used and the accuracy of the sediment plume modelling both inside the harbour and in Blueskin Bay;

b) sand and finer sediments adversely affecting the beaches of Blueskin Bay and the shore north to Karitane;

c) the prospect of the surfing waves at Aramoana changing, resulting in loss of the nationally significant surf break;

d) the shoreline of the Aramoana ecological area and how this might be affected by the change in channel depth and width; and

e) wake waves from larger vessels causing accelerated erosion of the harbour shoreline.

[329] We note [at 168] that Mr Russell, who is a doctoral candidate studying physical oceanography and has some knowledge of these matters, expressed concern about the reliability of the hydrodynamic modelling in his evidence on behalf of the East Otago Taiāpure Management Committee. He is concerned that sediment from dredge spoil disposal would end up in the Taiāpure management system. He believes the strength of the gyre in Blueskin Bay is unknown. While we accept that the modelling used is, arguably, the best tool available for predicting currents and sediment distribution in this instance, we note that Dr Bell has recommended further modelling to verify the results from the model. We refer to Dr Bell's recommendations later [at 370].

[330] The effect of the sediment plume on flora and fauna was the basis of many of the concerns about sediment movement. We have considered this in more detail Section 6.5: Ecology. Generally, we are satisfied that submitter concerns with respect to hydrodynamics and coastal processes have been considered in the expert evidence provided by POL.

[331] The s.42A report prepared by ORC provided an excellent record of the activities associated with the proposal and the effects on the environment. As far as the dredging operations are concerned the Reporting Officers reported in detail on plume monitoring,

particularly turbidity. We think Dr Bell's comments on the s.42A report concerning modelling are relevant.

> *The modelling results I have presented are mainly to provide a context in which effects are assessed, whereas in-situ monitoring within an adaptive management approach is the modern way of managing the effects of suspended sediment from dredging operations.*

The s.42A report did not bring to our attention any effects of the proposal, with respect to hydrodynamics and coastal processes, about which we should be concerned.

[332] In reaching our own conclusions on the effects of the proposal on hydrodynamics and coastal processes we are mindful of the fact that dredging activities have been on-going in Otago Harbour for over 140 years. Mr Davis, on behalf of POL, provided us with a very helpful record of the history of dredging in the harbour. While much of the early dredgings went into harbour reclamation, it is apparent that about half the amount dredged in that time (some 17.5 million cubic metres) has been disposed at sea, outside the harbour entrance. With this in mind, and in the absence of any compelling evidence to the contrary, we accept the applicant's evidence that the effects of the proposal on hydrodynamics and coastal processes, when considered in light of an adaptive EMP and the further monitoring proposed, would not be more than minor.

6.4 Water quality

[333] The maintenance of water quality in the coastal marine area is fundamentally important. The activities of dredging and disposal will disturb the seabed and generate consequential discharges that have the potential to adversely affect water and sediment quality. Similarly the activities of constructing and operating the Multi-purpose Wharf extension and fishing jetty also have the potential to affect water and sediment quality. These are, thus, subject to s.107 of the Act, which places restrictions on granting an application to discharge a contaminant or water into water.

[334] The effects on water quality as a result of the dredging, disposal and wharf/jetty construction, constitute one of the more significant issues attached to this proposal and are considered sequentially below. The effects may, in turn, impact on the marine ecology and these are discussed in Section 6.5 below.

[335] In describing the harbour system, Professor Probert [83], for POL, reported that water in the harbour is derived largely from the Southland Current that flows northwards along the

southeast coast of the South Island. Inshore, this water is influenced by freshwater from the Clutha River and, to a lesser extent, other rivers. Within the harbour there is also freshwater input, largely from the Waters of Leith in the Upper Harbour. Islands at the junction of the Lower and Upper harbours means that water in the former turns over more quickly than that in the latter. Water temperature ranges from 6º and 18ºC but is less variable in the Lower Harbour.

[336] Professor Probert believes that the main source of sediment in the harbour is the Clutha River, which supplies sediment to the inner shelf. Finer sand in the nearshore zone is swept north by the Southland Current and some of it is carried into the harbour by flood tides. He noted that water quality has been influenced by various activities such as changes in the use of the adjacent land, soil erosion and runoff of nutrients and contaminants, and atmospheric inputs. Some alien species have been introduced and, although trials of cockle harvesting are currently taking place, he stated that there are no commercial fisheries within the harbour.

Dredging effects on water quality

[337] POL's evidence acknowledged that dredging disturbs the seabed with the consequence that sediment is mobilised directly into the water column, changing the turbidity and the SSC of the water. Other dissolved or adsorbed contaminants may also be released into the water column. The degree to which the water quality is affected is influenced by the particle size of the sediment and the degree to which the dredged seabed is contaminated. Typically, the finer the particle size the more likely it will be entrained in the water column and the longer it will take to settle.

[338] Dredging using a TSHD (including the "New Era") would generate two main sources of sediment plumes:

a) bottom disturbances from the moving suction head; and

b) overflows that commence when the hopper first fills with a seawater/sediment mixture.

[339] The dredged sediment is discharged into a hopper in which the coarser material settles while the finer material stays in suspension as a supernatant[9] and is discharged back into the harbour. A plume of sediment is generated by the dredger from the combined effects of the direct seabed disturbance and the discharge of the supernatant.

[340] The chemical composition of the sediment plume may also be impacted by the quality of discharges from adjacent activities such as stormwater discharges from adjacent urban

[9] Defined here as the liquid floating on the surface above the bulk of sediment in the dredge.

activities or from the vessels in the port and adjacent marina. Contaminants may include heavy metals (typically lead, copper and zinc), a range of hydrocarbon compounds and chemicals used in ship antifouling paints.

[341] The effects on water quality of sediment dispersion have been modelled to predict the areal extent, concentration and duration of any sediment plumes. This modelling has considered the effects of a moderate size (hopper capacity of approximately 11,000m^3) TSHD[10] and the currently used smaller dredge, the "New Era"[11], which has a hopper capacity of 600 cubic metres.

[342] The modelling assumptions and the expected results from the sediment plume dispersion from the dredging activities within the harbour are described in the evidence of Dr Robert Bell[12] on behalf of POL. The modelling was peer reviewed by Tonkin & Taylor Ltd[13] on behalf of the applicant and also by Dr Ross Vennell on behalf of ORC. Although we have not been provided with a copy of Dr Vennell's peer review report, the s.42A Report states that both the Tonkin & Taylor and Vennell peer reviews conclude that the modelling undertaken by the applicant was appropriate for the proposal.[14]

[343] Notwithstanding the applicant's confidence in the model results, supported by the two peer reviews, Dr Bell advocates for plume intensity monitoring of suspended sediments in the plume behind the dredge when working both predominantly sand and predominantly silt claims inside Otago Harbour.[15] Dr Bell considers such monitoring would be used as contextual information to:

a) assess the veracity of the harbour plume modelling results against the field measurements; and

b) as input to ongoing reviews of the monitoring programme.

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[10] Reported in Bell et al (2009), *Port of Otago dredging project: Harbour and offshore modelling*.

[11] Reported in Bell and Reeve (2010), *Sediment plume dispersion modelling: Comparison of a larger dredger and the New Era.*

[12] Dr Bell is a Principal Scientist- Coasts and Hazards with NIWA. Refer to paragraphs 83 to 104 of his evidence.

[13] This was provided by the applicant at the hearing as *Review of Port Otago Dredging Project: Harbour and Offshore Modelling, Tonkin & Taylor, August 2010*.

[14] These peer reviews are discussed in paragraphs 10 to 13 of the s.42A Planning report.

[15] Refer to paragraph 166 of Dr Bell's evidence.

The applicant proposes to undertake this monitoring as outlined in the draft EMP[16]. The need for this monitoring has been carried through in draft conditions appended to the s42A Report and revised by Ms Watt following her consideration of the applicant's and submitters' evidence.

[344] Furthermore, the draft EMP proposes a suite of water quality criteria for water in the harbour, based on the measurement of turbidity at fixed locations within the harbour, as measured in nephelometric turbidity units (**NTU**). In the event that the relevant criterion is exceeded, a series of management responses is proposed. These measures include notification to ORC, assessment of impacts, and relocating, reducing or suspending the dredging operation.

[345] A number of submitters have raised concerns over the effects of dredging on water quality, particularly as a result of elevated suspended solids concentrations. Many of these concerns relate to the consequential effects that degraded water quality may have on marine ecology. These matters are discussed in more detail in Section 6.5 below.

[346] However, Southern Clams Ltd (**SCL**)[17], a company that undertakes a commercial shellfish gathering operation within the harbour in close proximity to the port and channel, raised specific concerns over the measurement of turbidity. The point raised by SCL's expert witnesses, Dr Stewart[18] and Ms Black[19] is that they consider the relationship between turbidity and suspended solids concentration to be uncertain and worthy of further confirmation. Clearly, it is the actual concentration of suspended solids that may have the most significant effect on water quality. The continuous monitoring of turbidity, in NTU, has thus been proposed to assess compliance with water quality criteria. While this this raises questions over the appropriateness of the particular turbidity values assigned as water quality "trigger levels", we expect that this can be resolved though ongoing monitoring and any necessary adaptive management.

[347] Dr Stewart and Ms Black cite monitoring from the dredging of Port of Hay Point by the Ports Corporation of Queensland, Australia where the relationship between turbidity (measured in NTU) and suspended solids (measured in mg/L) was 1:2.2.

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[16] Refer to Section C Monitoring and Adaptive Management (Environmental Management Plan) of the draft EMP provided by the applicant during the hearing.

[17] Submitter No.135.

[18] Refer to Paragraphs 4.38 and 4.39 of Dr Stewart's evidence.

[19] Refer to Paragraphs 52 to 56 of Ms Black's evidence.

[348] By contrast, Dr Hickey[20], who presented water quality evidence on behalf of POL, provided a graph of the relationship between turbidity and suspended solids produced from data from Otago Harbour. The graph is referred to as the Ravensdown relationship. The data presented in the graph shows a 1:1 relationship between turbidity and suspended solids.

[349] As a part of POL's right of reply, Mr Coe presented a supplementary statement of evidence on behalf of POL. In this statement he clarified the origin of the graph provided by Dr Hickey. We understand from Mr Coe's supplementary evidence that the graph was based on 3 months of turbidity monitoring undertaken by NIWA for POL in 2008 and reported in a client report titled *Turbidity Monitoring in Otago Harbour – Data Report*. Mr Coe attached a copy of this report to his supplementary evidence. This report contains the results of 10 grab samples (5 samples from two different locations) analysed for suspended solids concentration along with 3 months of turbidity data (logged every 15 minutes). This data report concluded that the initial 3-month period provided a baseline time-series of average background levels. However, due to a lack of major rainfall events during the monitoring period, there were no significant inflows to the harbour. The report recommended that the grab sampling for SSC and turbidity measurements be continued in the future whenever a major event takes place, to build up the data series. In the absence of any further turbidity versus SSC data, we assume this recommendation has not yet been implemented.

[350] Given the importance of the relationship between turbidity and SSC to the proposed water quality thresholds, in the event that we grant consent, we consider it necessary for this to be definitively established at the dredging sites. We accept that conditions can be imposed to require this.

[351] The New Zealand Marine Sciences Society[21] and others[22] raise concerns in their submissions over a perceived lack of information provided in the application about the nature and fate of sediment contaminants, and the potential for bioaccumulation. In particular they consider the contaminant investigation reported in Single et al. (2010)[23] to be inadequate to represent the potential sediment quality effects from the proposed dredging operation. Their

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[20] Dr Hickey is a Principal Scientist with NIWA specialising in water quality guidelines and environmental toxicology.

[21] Submitter No.141.

[22] Submitter Nos.185 and 193.

[23] Single et al (2010) *Physical coastal environment of Otago Harbour and offshore: assessment of effects of proposed dredging by Port Otago Ltd*.

concerns relate to the representativeness of the sediment samples, the suite of contaminants analysed, and the lack of toxicity testing to determine bioavailability of contaminants.

[352] Dr Hickey provided evidence on behalf of the applicant of a further contaminant assessment. The final report containing the results of this investigation was still in a draft form at the time of the hearing and was not provided by POL. However, the results of this investigation were attached to Dr Hickey's evidence. The contaminant assessment programme was designed by Dr Hickey to provide a comprehensive suite of chemical data for the potentially most contaminated sites. The effects assessment considered three major components:

a) ecological effects of chemical contaminant associated deposited dredge material (i.e. whole sediments); and

b) ecological effects on water column species of disturbed dredge material (measured on sediment elutriates with chemical and toxicity testing bioassays); and

c) potential human health effects of contaminant-affected food chains.

[353] Dr Hickey submitted that the sediment sampling undertaken in 2010 for chemical contaminant assessment, and sediment elutriate chemical and toxicity measurements, provides a robust basis for assessing the potential for contaminant-related effects from the deposited dredge material and on the water column during dredging and disposal operations.

[354] From this further work Dr Hickey concluded that there is a very low concern for chemical contaminant-related adverse effects associated with the proposed dredging and disposal operations. Although this information was not provided to submitters for their consideration prior to the hearing, we consider this further work may have gone some way to addressing the concerns raised.

[355] Furthermore, the issue of evidence of bioaccumulation of toxins was raised in questions directed to Mr Belton, Managing Director of SCL. Mr Belton advised that the clams harvested by SCL are extensively monitored for their meat quality as a part of the harvest programme. Mr Belton was not aware of any issues of bioaccumulation of toxins in the shellfish his company had harvested in the vicinity of the port.

Disposal effects on water quality

[356] Dredged sediment is proposed to be disposed at four possible sites. Three of these sites are in the vicinity of the harbour entrance and are currently consented to receive sediment from maintenance dredging. A proposed variation to this consent to allow disposal of spoil from the capital dredging would not alter the volume or texture of sediment presently permitted to be

disposed at these sites. Therefore, the effects on water quality would not change from those permitted by the current consent.

[357] The potential effects on water quality of disposal of dredged sediment at the proposed site, A0, have been described on behalf of the applicant in the evidence of Dr Bell. Specifically, Dr Bell discusses the short-term plume dispersal and the long-term fate of dredged sediment from the offshore disposal at site A0, using either a moderate size TSHD for Major Capital Dredging or using a smaller dredge, such as the "New Era", for Incremental Capital Dredging.

[358] The effects of dredged-material disposal operations offshore at A0 were assessed on the basis of sediment plume modelling, which is primarily driven by a 3-layer offshore hydrodynamic model[24]. To simulate sediment plumes from cyclic hopper releases at A0, a passive particle-tracking plume model, MIKE-3 FM PT, was adopted.

[359] The two key aspects for assessing environmental effects that are required from the offshore sediment plume modelling are: information on the spatial extent of suspended-sediment concentrations in the water column, and sediment deposition on the seabed.

[360] The modelling predicted that, for the moderate-size TSHD, considering all silt-size classes in the vicinity of A0, a moderate (14 m/s) WSW wind would generate the most adverse conditions for sediment concentrations in the bottom layer. Across all silt-size classes and a predominantly-silt hopper load, maximum suspended-sediment concentrations for this scenario may reach around 900 mg/L above background levels just "downstream" of the disposal area. For an average sand/silt hopper load, the maximum concentration for all silt size classes would be about 30% less at around 620 mg/L. Out of the 6 wind scenarios, the highest surface-layer concentrations for all silt-size classes would occur during light (3 m/s) NNE winds with a maximum concentration of around 270 mg/L above background, and about 30% less at 185 mg/L for an average sand/silt hopper load.

[361] In the vicinity of the A0 disposal area, the suspended-sediment concentrations for predominantly-silt loads from "New Era" are predicted to be no more than 7–11 mg/L and 47–57 mg/L above background levels, in the near-surface and bottom ocean layers respectively. For an average sand/silt hopper load, peak concentrations would be similarly between 23–33% less than for predominantly-silt hopper loads.

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[24] Described in Bell et al. (2009). *Port of Otago dredging project: Harbour and offshore modelling*. NIWA Client Report HAM2008-179 prepared for the Port Otago Ltd., 340 p. [**Technical Report 10, lodged documents**]

[362] Further afield, the model predicts that fringes of sediment plumes generated during disposal may sometimes reach the coastline north of Karitane and around Otago Heads. However, in practice, Dr Bell considers the suspended-sediment concentrations of silts will be very small.

[363] For the coastline north of Karitane, particularly north of Cornish Head, the model predicted that maximum concentrations in the dilute edge of the plume from predominantly-silt loads would not be elevated above background levels by more than about 0.02 mg/L in the Karitane area, and up to only 0.9 mg/L for a mid-size TSHD under light NNE winds. For the same stretch of coastline, the maximum concentrations for the "New Era" would be no more than 0.05 mg/L above background levels for the six different wind simulations undertaken.

[364] Dr Bell considers that, under light NNE or WSW winds, the dilute fringe of sediment plumes may also reach Otago Heads, in theory, where the maximum concentrations for silts would be no more than 2-3 mg/L above background levels for a moderate-size TSHD, and 0.6 mg/L for the "New Era". Dr Bell concluded that these coastline concentrations are so small they would be difficult to detect in the field and, in effect, are an artefact from modelling a continuum down to infinitesimally small concentrations.

[365] Furthermore, Dr Bell considers the plume is not likely to come into contact with Otago Heads during strong winds from either the WSW (21 m/s) or NNE (15 m/s). He believes that for winds from the NNE blowing onshore, stronger NNE winds induce a return flow offshore that occurs in the bottom layer under such strong wind conditions. Therefore, high wind situations from the NNE or NE would not result in any encroachment of the plume's edge at any part of the Otago coastline.

[366] Patterns of sediment plume dispersion and the areal extent of influence are reported by Dr Bell to be broadly similar between the two sizes of dredge. This is as he expected as the sediment would be released at the same location, from which the same environmental processes e.g., tides, winds, currents, and turbulent eddies govern the dispersal characteristics of the plume. Dr Bell reported that there would, however, be subtle differences in the extent of influence, mainly along the onshore and offshore fringes of the plumes. These differences arise from the shallower discharge (2 metre depth) from the "New Era" compared with the moderate-size TSHD (5 metre release depth), which means the plume from the "New Era" would be initially influenced by near-surface water processes for a slightly longer period while sediment settles through the 3 metre discharge height difference between the two dredge sizes.

[367] As with the modelling of the effects on water quality of the harbour dredging, the model assumptions and results from the sediment plume dispersion from the disposal activities

at the offshore A0 site were peer reviewed by T&T on behalf of POL, and by Dr Ross Vennell on behalf of ORC. Both the T&T and Vennell peer reviews concluded that the modelling undertaken by the applicant was appropriate for the proposal.

[368] Consistent with the approach proposed with the dredging operation, Dr Bell advocated monitoring the intensity of suspended sediments in the plume generated from spoil disposal at the A0 site. However, in his opinion, long term monitoring of turbidity in the offshore shelf area, or at sites along the Otago coast, is fraught with problems in interpreting the results, particularly with regard to the high variability of background turbidity from wave action, and river and catchment run-off.

[369] Detailed recommendations for monitoring of the disposal plume are set out in Dr Bell's evidence[25]. In summary he recommends the following:

a) Two intensive sets of monitoring of suspended sediments in the plume at A0 following disposal from the dredge hopper for a load of predominantly-sand and predominantly-silt material respectively. These two sets should be repeated for each specific dredge that is used and, ideally, should be performed for the same dredge cycle, and hence hopper load, that was monitored inside the harbour.

b) Tracking the plume offshore beyond 1 km, if practicable, with guidance from the aircraft undertaking the aerial photography. Undertaking these one-off monitoring programmes at A0 should also be undertaken in relatively cloud-free conditions to enable a comparison to be made with MODIS satellite imagery.

c) Two separate 1-month deployments of self-recording turbidity sensors near the surface and near the seabed on the north-east corner of the A0 disposal area where the plume is most likely to travel past. This should be undertaken for a winter and a spring/summer period during Major Capital Dredging using a moderate-size TSHD.

d) Similar fixed-buoy 1-month deployments should also be undertaken for Incremental Dredging using the "New Era", but only if the mobile plume-intensity monitoring shows suspended sediment concentrations in the top 5 m of the water column exceed something like 50 mg/L (or equivalent in calibrated NTU) after allowing for reasonable mixing e.g., 300–500 m downstream of the "New Era".

[370] Dr Bell advised that POL has volunteered to undertake this monitoring and this would be included in the EMP. The need for this monitoring has been carried through in the draft

[25] Refer to Paragraphs 167 to 173.

conditions appended to the s42A Planning Report, and revised by Ms Watt following her consideration of the evidence provided at the hearing.

[371] Many submitters[26] commented on various aspects of water quality and, in particular, on the plume modelling for the offshore disposal area at A0. In some cases the concerns related to the effects of the disposal on water quality and, in other cases, to the consequential impacts of degraded water quality on the marine ecology and fishing resources. These matters are discussed in more detail in Section 6.5 and Section 6.11.

[372] Dr Bell responded to the issues raised by these submitters in his evidence[27] and outlined what he considers to be a practicable monitoring programme to verify the model predictions and to provide inputs to manage the effects through an adaptive approach.

Wharf/jetty construction water and sediment quality effects

[373] The construction of the Multi-purpose Wharf extension and the fishing jetty has the potential to affect water and sediment quality. The application notes[28] that a small amount of concrete laden water and sediment would be discharged when constructing the wharf extension and the fishing jetty, and that this cannot practicably be avoided. However, these discharges are considered to be localised, temporary, and readily assimilated within a short distance.

[374] The s.42A Report[29] acknowledged the issue and proposed that the EMP includes a description of the construction methodology and actions to manage the effects on a range of values including water quality. This is also reflected in the proposed draft conditions attached to the s.42A Report.

Water quality effects conclusion

[375] It is apparent that there would be effects on water quality as a result of the dredging, disposal and wharf/jetty construction.

[376] The proposed dredging operation would generate a sediment plume. POL has modelled the areal extent, suspended solids concentration, and the duration of the plume. The model assumptions and application have been subject to two peer reviews and considered to be fit for

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[26] Submitter Nos. 11, 44, 64, 69, 71, 108, 129, 130, 137, 141, 144, 149, 153, 155, 163, 167, 168, 171, 179, 183, 185, 193 and 198.

[27] Refer to Paragraphs 185 to 192 of Dr Bell's evidence.

[28] Refer to the Next Generation AEE (25 May 2010), pages 170 and 171.

[29] Refer to Paragraph 411.

purpose. In any event, POL has proposed turbidity monitoring during the dredging operations that would feed back through an adaptive management process, which would be used to take necessary action in response to any threshold exceedances. Conditions of consent have been proposed to require this adaptive management approach.

[377] Similarly, the effects on water quality of disposal of dredged sediment at the A0 site have been modelled and peer-reviewed. As with the dredging, a monitoring programme is proposed that would provide information to adaptively manage the effects of the disposal operation on water quality.

[378] The effects of the construction of the wharf extension and fishing jetty on water quality are considered to be minor and, in the event that we grant consent, can be appropriately managed through the construction methodology and conditions of consent.

6.5 Ecology

[379] This section considers the effects of the proposal on the ecology of the area. These matters are enshrined in Part 2 of the Act. In particular, s.6(c) requires us to recognize and provide for *the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna* as a matter of national importance. Furthermore, we are also required to have particular regard in s.7(d) *to the intrinsic value of ecosystems*.

[380] The project has the potential to affect a range of ecological values through the activities of dredging and disposal of sediment. These effects include impacts on planktonic and benthic flora and fauna, bird life, marine mammals and fish. The applicant has provided a number of technical reports on the potential ecological effects . These reports are a combination of reviews of existing information and project specific investigations to fill perceived information gaps.

[381] An outline of the evidence presented on behalf of POL is included in Section 4.2 of this decision. The following experts presented evidence on the potential effects of dredging and disposal operations on ecology, on behalf of POL:

a) Professor Probert on the current benthic environment in Otago Harbour.

b) Dr James on the ecology of the Lower Harbour and the A0 offshore disposal site.

c) Mr Boyd on the fisheries of the Lower Harbour, the A0 offshore disposal site and surrounding area.

d) Mr Sagar on the bird life of the Lower Harbour, the A0 offshore disposal site and surrounding area.

e) Mr Cawthorn on the marine mammals in the Lower Harbour, the A0 offshore disposal site and surrounding area.

Effects of dredging on ecology

[382] The assessment of the effects of dredging on ecology have, to a large extent, relied on the predictive sediment plume modelling described in the evidence of Dr Bell. This modelling predicts the areal extent, sediment concentration and duration of the plume that would result from dredging operations. This information is complementary to that provided in the evidence of Professor Probert, which summarised the state of knowledge of the harbour's benthic habitats and communities.

[383] Professor Probert advised that the harbour is biologically and ecologically an important feature of the coastal environment of southern New Zealand and that the Lower Harbour is more biologically diverse than the Upper Harbour. Environments include a significant salt marsh at Aramoana, extensive sandflats, deeper channels and some rocky intertidal zones.

[384] Professor Probert described the Lower Harbour as a patchwork of structural areas characterised by algal mats, seagrass, cockle beds, rippled sand (the dominant intertidal habitat), tube mats, shell hash, rocky shore and mudstone pavement. He considers the Aramoana saltmarsh is one of the most extensive and intact areas of its kind on the east coast of the South Island, and noted that it is protected as an Ecological Area under the Conservation Act 1987.

[385] Professor Probert also noted that the harbour has been considerably modified by humans with extensive reclamations, particularly at the head of the harbour, and by dredging.

[386] In response to some of the submitters, Professor Probert stated that, as a result of the surveys carried out for the proposal, the benthic studies are the most detailed to date for the Lower Harbour. He concluded that the information on the benthic ecology of the harbour was sufficient to assess the effects of the proposed dredging and to develop appropriate monitoring programmes.

[387] This view was reiterated by Dr James. In his opinion, a considerable amount of work has been undertaken on the ecology of Otago Harbour and offshore. However, there had been gaps identified in the knowledge and, in collaboration with others, further work was completed. Dr James considered these studies, commissioned by POL, to be the most comprehensive surveys to date of benthic community in the harbour and Blueskin Bay. He noted that no rare, unique or endangered species were found in either soft sediment or rocky shores and the formerly present brachiopod, Pimilus, was not located.

[388] Dr James considers that the effects of higher suspended sediments and increased sedimentation from capital dredging would be inevitable close to the channel in areas that are being dredged. In most of the intertidal areas, he expects suspended sediment to be below thresholds that most of the benthic community can tolerate for short periods (2-4 weeks). He also expects significant effects in the channel and on the margins to be mostly short to medium-term, and communities could be expected to recover once the Major Capital Dredging programme is completed, although this could take several months to a few years. However, Dr James considers Incremental Capital Dredging would not have a significant effect because of the low intensity and the ability to manage the dredging programme to minimise impacts, if they were to occur.

[389] In considering dredging in the vicinity of the port, where there is a higher proportion of finer-grained sediments, Dr James said there is potential for higher sedimentation rates and significant localised effects. With Major Capital Dredging the average deposition over the dredging period in this area is predicted to be up to 9 mm but up to 10% of the intertidal zone in this area (10.5 ha) could receive over 23 mm and a very small area (1.1 ha of the intertidal zone) would be subject to over 80 mm over a 14-day period of dredging. Away from the channel Dr James expects the impacts to be insignificant.

[390] Dr James predicted that suspended sediment concentrations and deposition in sensitive and key areas like Te Rauone Beach and Aramoana would be low when capital dredging nearby using a large contract dredge. He expects this would have no more than a minor impact on the overall ecology of the harbour. Furthermore, Dr James contended that these areas would be subject to considerably lower concentrations during Incremental Capital Dredging and the effects on benthic communities would be negligible.

[391] Similarly, Dr James considers that most of the seagrass beds found in the middle of the intertidal flats, and recognised as critical habitat for a range of species, would be expected to persist as they can tolerate the predicted suspended solids concentrations for short periods. Furthermore, undertaking Incremental Capital Dredging is expected to have a negligible effect on seagrass beds.

[392] Dr James also considers that the shellfish species of interest to recreational, cultural and commercial fishers, including cockle (tuaki), pipi and tuatua, would persist and recover from any effects of the dredging operation.

[393] While it is expected that invertebrates and fish in the immediate vicinity of the blasting of rock substrate would be impacted, Dr James predicts any effects to be minor and, with appropriate mitigation, most mobile species can avoid the blasting.

[394] Dr James acknowledged that some of the adverse effects of dredging cannot be avoided, particularly during Major Capital Dredging. He considers these would generally be localised with direct effects on the benthic community confined mainly to those areas to be widened, and to the deeper parts of the channel. Furthermore, he considers recovery would only take several months for many species and, although it could be several years for longer-lived species, there would be no long-term loss or large-scale irreversible changes in the benthic community.

[395] Mr Boyd noted that, although habitat type is a key factor in the distribution of fish and shellfish, the aquatic environment within which they are found and can freely move about in means there are no clear boundaries to their populations. He commented that many types of fish found within Otago Harbour move in and out with each tidal cycle while some fish remain in the harbour's channels at low tide. Therefore, fish presence and abundance at any given location within Otago Harbour tends to be highly dynamic.

[396] From the perspective of the ecological impact of dredging on fish species within Otago Harbour, Mr Boyd concluded that these potential effects would be localised and minor.

[397] Mr Sagar contended that the birdlife within Otago Harbour is dominated numerically by gulls, waders (such as oystercatchers and godwits) and shags. Furthermore there is a large body of information available, extending over several decades, about the abundance and occurrence of birds within the harbour and the adjacent coast. This shows that the abundance of each species varies with season and between years. Relatively few birds breed within the harbour or along the adjacent coast, and so those that do not are usually absent from the area during their various breeding seasons.

[398] Within the harbour, most birds feed either from the surface waters (e.g., gulls and terns), intertidal flats (e.g. gulls and waders), or underwater (e.g., shags). Mr Sagar considers that potential adverse effects from dredging and disposal of dredged material would vary according to the type of vessel used, and the feeding strategy of the birds. In his opinion, Incremental Capital Dredging would be unlikely to have any discernible adverse effects on any of the birds in the area under consideration. This is based on the estimate that, except in the immediate vicinity of the disposal site, the suspended sediment concentrations predicted would not be expected to affect planktonic animals (food for seabirds and fish) and would be below the level set in the Port of Melbourne case to protect birds such as terns and gannets.

[399] Mr Sagar considers the effects of dredging would depend on the type of vessel and the feeding strategy of the birds. Incremental capital dredging by the "New Era" is unlikely to have any discernible adverse effects.

[400] Mr Sagar advocated mitigation measures, such as avoidance of the critical breeding period over spring at Aramoana and Taiaroa Head, and similar constraints on dredging when godwits are foraging on the intertidal flats at Aramoana. He believes these measures would also be of benefit to the Blue Penguins.

[401] Mr Cawthorn, who is an expert on marine mammals, described the marine mammals frequenting the harbour and surrounding area. He noted the presence of four pinnipeds and seven cetacean species found in the Otago area. Mr Cawthorn considers that only New Zealand fur seals, New Zealand sea lions, Hector's dolphins and southern right whales are likely to be influenced by the proposal but not detrimentally affected.

[402] This view is also held with respect to the effects of any necessary blasting in the area from Port Chalmers to Acheron Head. Mr Cawthorn considers that, as the nearest marine mammals are sea lions hauled out at Aramoana and Te Rauone, it is most unlikely that any detrimental effects would be experienced by these animals. Furthermore, as Hector's dolphins and other species very rarely enter the harbour they are also not expected to be affected. Right whales and humpback whales are sufficiently distant from the blast site to be unaffected.

[403] A number of submitters expressed concern over the effects of dredging and the consequential disturbance and mobilisation of sediment on the harbour's benthic habitat and communities, fish, bird life and marine mammals. Areas of particular concern are the Aramoana salt marsh, the Lower Harbour's intertidal shell/sand banks and the areas of rock near Acheron Head and Rocky Point identified as requiring blasting.

[404] Ensuring the sediment plume resulting from the dredging disperses as predicted is critical to predicting the ecological effects of the dredging on the areas identified by submitters as of particular concern to them. POL proposes to implement an EMP that would have trigger levels for turbidity. Should monitoring of the dredging operation show that these levels are exceeded a range of management responses are proposed to avoid the effect, including altering the dredging methodology or suspending the dredging operation.

[405] Southern Clams Ltd (**SCL**) raised particular concerns about the effects of sediment mobilised from the dredging operation on the population of Austrovenus stutchburyi, more commonly known as cockle or tuaki.

[406] Ms Black, appearing on behalf of SCL, presented evidence on the potential impacts of sediment generated from the dredging operation on the cockle beds. She cited a body of literature, from overseas and from studies in the Auckland region, where the effects of

sedimentation on benthic communities has been measured and shown to be detrimental at small levels of deposition (circa 3mm).

[407] Professor Barker also made reference to an Auckland study on the effects of SSC on suspension and deposit feeding marine animals. He considers there is a lack of knowledge of the long-term effects of high suspended sediment levels and suggested that a well-designed monitoring programme be implemented prior to and during dredging. This was a view expressed by a number of other submitters.

[408] However, the evidence of Dr James highlighted that studies on sedimentation effects in the Auckland region were based on terriginous sediment discharging from the surrounding catchment into the marine receiving environment, as distinct from the effects of marine sediments being disturbed by dredging and redistribution.

[409] Dr James acknowledged that the growth and condition of bivalves close to the channel could be impacted during dredging in those areas but contended that repeated deposition at this rate is unlikely to occur except in the short-term (days). He would expect bivalves to recover within the short to medium term once operations with the large dredge stopped. Predictions for SSC and sedimentation using the smaller "New Era" dredge, or similar, are that concentrations would be well below those levels known to impact on shellfish.

Effects of disposal on ecology

[410] Dr James described the benthic habitat in Blueskin Bay, including the A0 site, as being comprised of fine sand. He reported that the density and diversity of benthic animals was highest just north of the harbour entrance and lowest in central and inner parts of Blueskin Bay. He reported, from the recent surveys, that the abundance and diversity of biota was higher at the A0 site and some 6 km to the north (at the limit of the survey area). Dr James described the fauna in the vicinity of A0 as typical of near-shore sand zones and no rare or unique species were observed. Furthermore, he considers the A0 site avoids sensitive bryozoan beds further off shore and is sufficiently seaward to have minimal impact on coastal reefs and rocky areas.

[411] POL acknowledges that adverse effects on ecology from disposal of large volumes of spoil cannot be avoided. The main effects on the benthic community from disposal at the A0 site are smothering and increased turbidity. POL considers it inevitable that, with Major Capital Dredging there would be significant short to medium term effects at the disposal site. It is predicted there would still be an impact for a few kilometres to the north but suspended sediment concentrations would drop progressively. Dr James considers most taxa could not survive repeated deposition in the vicinity of the disposal site and would be destroyed. He

predicted that recovery of some groups, such as polychaete worms, could be in the order of up to a year but some larger, longer lived taxa could take several years to recover at the site itself once dredging was completed.

[412] Dr James considers sedimentation and suspended sediment levels would be considerably lower with Incremental Capital Dredging using the smaller "New Era" dredge. Dr James would not expect significant changes in the community and functioning but there could be some changes and more subtle shifts to more of an early successional/opportunistic stage benthic community. He would expect most groups to persist when dredging with the smaller dredge.

[413] Based on the model results, POL considers concentrations of suspended sediments and deposition, if the plume were to reach the coastline, would be negligible and that these concentrations would be expected to have no more than a minor impact, if any, on coastal communities. Furthermore, Dr James considers contaminants in the material to be dredged are at low levels and, therefore, would be at very low levels at the disposal site and would, in any event, be quickly dispersed.

[414] POL acknowledges that fish and birdlife can be impacted directly through impacts on foraging success and indirectly through effects on food resources. It is predicted that the increased levels of suspended sediments and reduced water clarity would affect the disposal site (A0) and immediately downstream, as well as dredging sites, but the levels of suspended sediments would be rapidly diluted away from these sites. Except in the immediate vicinity of the disposal site, and during Major Capital Dredging, the levels predicted would not be expected to affect planktonic animals (food for seabirds and fish).

[415] POL believes most seabirds found in the area off Otago feed well offshore (e.g., endangered grey-headed mollymawk and northern royal albatross), or are predominantly bottom feeders at depths over 40m (e.g., sooty shearwaters and yellow-eyed penguins). However, it is acknowledged that some birds such as shags and gulls may feed in the disposal area and, along with some fish species that feed on plankton or benthic biota, may be affected in the immediate area, over the medium term, and may have to forage more widely during Major Capital Dredging.

[416] The species of most concern to Mr Sagar, POL's bird expert, is the blue penguin as he considers this species is likely to feed in the area of the A0 site and has a more restricted foraging range than other species. He believes a reduction of foraging area due to Major Capital Dredging disposal, at the chick-rearing stage (the core period being October to December)

could result in a deficit of food. This, he said, would have no long-term or population effects once the spoil disposal ceases,

[417] With respect to marine mammals, Mr Cawthorn noted that a Hector's dolphin population in the Blueskin Bay area, currently numbering about 20 individuals, has existed with dredging and ship movements for over 140 years. Although their numbers have declined, he attributes this to types of fishing. His view is that the spoil disposal should have no effect on species recruitment.

[418] POL considers that, given the comprehensive monitoring programme proposed, which includes monitoring effects on the benthic community at representative and key sites in the harbour and offshore, there would not be any significant long-term effects

[419] Mitigation measures proposed include managing the dredging operation, where possible, to avoid the critical part of the recruitment and breeding period for birds over spring and summer at Aramoana and off Taiaroa Head. This would also help mitigate impacts on benthic biota in the region if such were to occur. It is also proposed that, when godwits are foraging on the intertidal flats at Aramoana in February and March, capital dredging is only undertaken when tidal height is above half-tide.

[420] The Director General of Conservation's (**DOC**) submission raised issues with respect to ecological matters relevant to, in particular, s.6(c) in Part 2 of the Act, the requirement to recognize and provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as a matter of national importance, and to have particular regard in s.7(d) to the intrinsic value of ecosystems.

[421] Since submitting on the application, DOC has continued to liaise with POL and has reached agreement as to how DOC's concerns can be addressed. DOC has agreed with POL over a set of specific consent conditions which:

a) avoids sensitive sites at sensitive times of the year;

b) avoids interaction with seabirds and marine mammals;

c) requires baseline and ongoing monitoring to determine the physical and biological effects of disposal at site A0; and

d) requires the establishment and service of a technical group that will receive and assess monitoring information and advise on ways to minimise the effects of the activities.

[422] The proposed technical group would have representation from local rūnanga, DOC, ORC and POL.

[423] The East Otago Taiāpure Management Committee (**EOTMC**) presented a comprehensive set of evidence expressing their concerns over the ability to correctly predict the levels of sedimentation from dredged sediment disposal at site A0, and the consequential effects on marine biota.

[424] On balance we are persuaded by POL's evidence on the potential effects of dredging and disposal at site A0. However, we also acknowledge there is a degree of uncertainty in predicting the effects on the benthic ecology and consider the adaptive management approach proposed by POL is the best practicable option to manage the potential effects. We also consider it desirable for the proposed technical advisory group to have a representative of the shellfish/fishing industry with appropriate expertise to provide input into the monitoring design and interpretation of data on the effects of the dredging on marine biota.

[425] We conclude that there would be impacts on marine biota in the short-term but that conditions can be imposed, if we are minded to grant consent, to ensure that the effects on ecology, overall, would be less than minor. In coming to this conclusion, we are conscious of the fact that dredging is an activity that has been taking place in Otago Harbour for the best part of 150 years without having significant adverse effects.

6.6 Natural character and landscape

[426] The need to recognize and provide for (as matters of national importance) the *preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development* is stated in s.6(a) of the Act. S.6(b) further provides for the *protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development*.

[427] Dr Mitchell summarised POL's evidence on the effects of PNG on natural character. He considers the dredging would be commensurate with the natural character of the shipping channel within which it is to be undertaken, and the wharf extension and the new fishing jetty would also be in keeping with the natural character of the commercial port area in which they would be located.

[428] Dr Mitchell pointed to the evidence of Drs Single, Bell and James on the effects of the proposal on natural coastal processes, patterns and ecological elements, which contribute to the

natural character. This evidence is discussed in more detail in the relevant parts of Section 6 of this decision pertaining to water quality, ecology and hydrodynamics and sediment processes.

[429] Dr Mitchell noted that the RCP identifies three Outstanding Natural Features and Landscapes (**ONFL**) in the vicinity of the proposed dredging. These are Hayward Point, Otago Peninsula, and Goat and Quarantine Islands. He pointed out that Dr Single did not consider the proposed dredging would directly or indirectly cause any physical effects on the shoreline of those features, which would be significantly different to present.

[430] The effects of port operations on the Multi-purpose Wharf extension, on the visual elements contributing to natural character are canvassed below in Section 6.7 where we discuss visual amenity.

[431] In the absence of any evidence to the contrary, we conclude that neither the natural character of the coastal marine area, nor any outstanding natural features or landscapes, would be compromised by the proposal.

6.7 Amenity values

[432] S.2 of the Act defines 'amenity values' as *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*. The need to have particular regard to those qualities is covered in several ways in the Act but, in particular, in s.7(c) where it refers to the need to have particular regard to *the maintenance and enhancement of amenity values*.

[433] POL raised three matters with respect to amenity values[30]. These were noise, visual impacts and light spill. We discuss these matters below.

Noise

[434] POL identified the potential effects of noise from the proposal to include both, temporary construction noise associated with the dredging and construction of the Multi-purpose Wharf and the fishing jetty, and the long-term operational noise associated with increased activity resulting from future dredging and the Multi-purpose Wharf extension. Port noise, in particular, was a significant issue of concern to many submitters, particularly those resident in or near Careys Bay. We, thus, consider this matter with some care.

[30] Refer to paragraphs 215 to 235 of the evidence presented by Mr Coe.

[435] POL's noise expert, Mr Ballagh, submitted that the noise that would result from dredging the harbour channel as part of the proposal would be most noticeable at night, between 10 pm to 7 am, as at other times other noise sources would mask that emanating from the dredging. It would also be more noticeable in the smaller settlements overlooking the channel because there are few other sources of noise. However, he noted that dredging is an intermittent process as the dredge is moving and has to go offshore to dump the spoil. Mr Ballagh considered the level of noise would be dependent on the noise of machinery, including engine noise that can vary between dredges and that it is possible to minimise this noise by careful selection of the dredge, and the length of time each day the dredge is operating.

[436] A noise level contour map for a large TSHD presented by Mr Ballagh showed that, for a worst case scenario, the 60 dB contour is offshore, albeit close to some of the points and promontories on the north side of the harbour. The 45 dBA (construction noise night time limit) contour, while mostly offshore, crosses the land well inshore of Boiler, Rocky, Acheron, Pulling and Tayler Points on the north side of the harbour, and more continuously, but to a lesser extent, the land from Otakou to Tairoa Head. These contours do not represent a single point in time but are constructed from the maximum calculated readings when the dredge is at a particular location in the channel.

[437] Mr Ballagh considers the noise effects from using small or large dredges are likely to be minor and the time when the noise exceeds 45 dBA is likely to be limited to a small number of locations, and for a few periods at night. He suggested a number of mitigation measures that could be introduced including selecting the quietest equipment practicable and programming of work in particular areas to limit night time exposure to residences[31].

[438] Mr Ballagh also noted that blasting of rock is a small part of the dredging proposal and can be limited to daylight hours. He has conveyed his findings to others who have assessed whether the blasting would have any impact on marine animals.

[439] Mr Ballagh pointed to the provisions of the New Zealand Standard, NZ6803, which covers construction noise[32]. He recommended that POL comply with the noise criteria set out in the standard to the greatest extent practicable, and stated that the company has agreed to this recommendation.

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[31] Refer to Paragraphs 63 to 68 of Mr Ballagh's evidence.

[32] Refer to Paragraphs 39 to 41 of Mr Ballagh's evidence.

[440] The operational noise is associated with transporting cargo to and from the wharves and the unloading and loading of containers and other cargo. This noise already exists and Mr Ballagh pointed out that there would be additional noise due to the longer duration that larger ships would take to load and unload, and an increase in the frequency of times when the berths would be used. He has attempted to calculate the effect of extending the Multi-purpose Wharf and the noise impact this would have, including effects on areas such as parts of Careys Bay for which Boiler Point presently acts as a buffer.

[441] If larger vessels used the George Street Wharf (Container Wharf) Mr Ballagh found that there would be no discernable change in noise and no adjustments would be required to the procedures currently in place.

[442] Mr Ballagh concluded that, if the Multi-purpose Wharf is used, there would be a reduction, probably insignificant, in noise as far as Port Chalmers was concerned. However, for Careys Bay, he predicts the noise would increase and could be expected to continue doing so as cargo volumes increased with time. Mr Ballagh said that, under the current noise management regime, this would mean the inclusion of up to 12 houses in the Harbour Terrace area of Careys Bay in the sound insulation programme set out in the existing Noise Mitigation Plan. We note that POL advised during the hearing that it intends to use the George Street Wharf as much as possible.

[443] After examining the rules in the district and regional plans, Mr Ballagh noted that there are specific noise limits that apply to dredging and other construction activities although the latter plan states that regard should be taken of the Construction Noise Standard. He considered the operational aspects of the proposed extension of the Multi-purpose Wharf to be covered by the Noise Mitigation Plan for Port Chalmers, which is required under the Dunedin City Council's district plan.

[444] Counsel for the applicant, Mr Andersen, considered that the operational use of the wharf extension is covered by Rule 21.5.2 of the Dunedin City Council (**DCC**) District Plan, the Port Noise Management Plan and the Port Noise Mitigation Plan. He pointed to these provisions being derived from a decision of the Environment Court in response to a reference to the District Plan provisions by the Careys Bay Association.

[445] Referring to case law it is clear that the issue of operational noise from Port Chalmers has been a complex and contentious matter for a number of years. Matters of jurisdictional responsibility, and the implementation of practices and procedures for noise management, have

been tested in the former Planning Tribunal, the High Court and the Court of Appeal and, more recently, the Environment Court[33].

[446] Mr Ballagh noted that there were 25 submissions that raised concerns over noise. The submission from the Careys Bay Association[34] included signatures from 40 people, some of whom also lodged separate submissions. From these submissions, and the evidence presented by submitters at the hearing, it is clear that the principal point of contention is the operational noise of the port, not only currently but also the prospect of increased noise as a consequence of an expansion in port activity.

[447] Operational noise from the port is generated on both sides of the jurisdictional boundary, Mean High Water Springs (MHWS), between DCC and ORC. Noise generated from within the CMA is sourced from the operation of the ships, that is from machinery (such as generators for the refrigerated containers) and activities on board the ship, and from the machinery and activities on the section of wharf seaward of MHWS. We do appreciate that, from a practical perspective, it is both difficult to differentiate and discern where a particular noise may be generated from and within which jurisdiction it is to be managed.

[448] It is a DCC function to control the emission of noise, and the mitigation of the effects function of noise, within its district[35], that is, landward of MHWS. It is an ORC function to control the emission of noise, and the mitigation of the effects of noise within the coastal marine area[36], seaward of MHWS to the 12 nautical mile boundary.

[449] However, from questions we raised concerning POL's evidence, it was noted that, in the Otago region, ORC has transferred its noise enforcement functions to DCC[37]. The Deed of Transfer relates specifically to the functions, powers and duties under the Act relating to the emission of noise and the mitigation of effects of noise in the CMA[38]. It includes monitoring and enforcement of the duties articulated in s.16 and s.17 of the Act; to avoid unreasonable noise and to avoid, remedy or mitigate adverse effects.

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[33] Refer to the Planning Tribunal decision, C48/96; High Court decision, AP 184/96; Court of Appeal decision CA62/97; Environment Court decisions C165/2002, C150/2003 and C41/2004.

[34] Refer to submission # 140.

[35] Refer to s.31(1)(d) of the Act.

[36] Refer to s.30(1)(d)(vi) of the Act.

[37] The Council's Reporting Officer provided a copy to the hearing panel of the Deed of Transfer of Noise Enforcement Functions between the ORC and the DCC. The deed is pursuant to s33 of the Act.

[38] Refer to the Deed's Schedule for the functions powers and duties transferred.

[450] The extent to which we are able to consider the effects of port noise from the PNG proposal are constrained. In the first instance, a permitted baseline is set through the Environment Court's decisions on a reference to the DCC District Plan provisions[39]. In its conclusion to the jurisdictional question the Environment Court[40] noted the following:

- *Although the proposed plan may include rules which address total noise generated or received at various points they can only control the emission of noise from Port Otago if that noise is created by Port Otago or on their site (Port 1 zone).*
- *The emission of noise from ships is not generated by Port Otago and cannot be used as a mechanism to control the activity of Port Otago either directly or indirectly.*

[451] In other words, the noise generated by ships, whether berthed at the port or not, is not a responsibility of POL. Enforcing compliance with the provisions of the Act for noise generated in the CMA is the responsibility of DCC, by virtue of the transfer of this responsibility through the Deed of Transfer from ORC.

[452] The interim and final decisions of the Environment Court[41], in 2003 and 2004 respectively, made in respect of the DCC District Plan reference on the control of noise at Port Chalmers directed, through provisions of the District Plan, the development and implementation of a Port Noise Management Plan and a Port Noise Mitigation Plan. Furthermore, it required the establishment of a Port Noise Liaison Committee with membership required from the Port operator, ORC, DCC, Careys Bay Association, and the Port Chalmers Community Board. We note that the matter of the district plan reference was settled by agreement of all of these parties through the lodgement of a consent memorandum.

[453] The evidence of Mr Coe for POL described how the Port Noise Management Plan and the Port Noise Mitigation Plan require POL to regularly assess and monitor port noise, particularly in nearby residential areas. There are provisions for the company to put in place mitigation measures, such as insulating buildings and for POL having to purchase properties, at market value, should the affected owners wish to sell.

[454] In spite of these agreed provisions, there is clearly still considerable concern over existing port noise. In her evidence on behalf of the Careys Bay Association[42], Ms Adams

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[39] Environment Court decisions C165/2002, C150/2003 and C41/2004.

[40] Environment Court decision C165/2002.

[41] Environment Court decisions C150/2003 and C41/2004.

[42] Submitter # 140.

submitted that the existing regime is, from their perspective, failing and the association believes it allows POL to avoid certain obligations under the Act.

[455] Ms Nicolau[43] raised concerns over the effectiveness of the Port Noise Liaison Committee and referred to the submission of Mr Hilder[44] claiming that he believed the Environment Court decision on the district plan (reference) was "intrinsically flawed". It was unfortunate that Mr Hilder was unable to present his submission in person at the hearing, as we note that he had represented the Careys Bay Association in the district plan reference proceedings in 2002 and 2003, and that the Association is recorded in the final decision as having agreed to the noise provisions now prescribed within the district plan.

[456] POL provided the hearing with copies of the Port Noise Management Plan, which sets out detail of the establishment of the Port Noise Liaison Committee (**PNLC**). The PNLC functions are undertaken by the Port Environment Liaison Committee (**PELC**), which has a prescribed list of members totalling 16 individuals. The constitution of membership of the PNLC requires a resolution of 80% of its members. The POL board, management, and users appointed by POL, make up six of the 16 members of the PELC. The Careys Bay Association is represented on the PELC by a single representative.

[457] We understand that Careys Bay Association is represented on the PELC by Mr Cecchi[45]. Mr Cecchi expressed particular concern over noise and considered that the noise effects from the port at present are unsatisfactory. After questions from us to Mr Cecchi we were left with the impression that he believed there were no real enforcement consequences to POL from generating excessive noise.

[458] It appears, despite the agreed position of POL and the Careys Bay Association through the Environment Court proceedings of 2002 to 2004, that the effectiveness of the PNLC to implement the Port Noise Management Plan is perceived to be inadequate by a number of the members of the community, the Careys Bay Association's representative on the PNLC, and the executive of the Association itself. We consider this to be a matter that needs to be addressed by each of the members of the PNLC, in particular DCC, which has the ultimate statutory responsibility for the control of the emission of noise and the mitigation of the effects of noise, both within its district and, by virtue of a transfer of powers, within the CMA. However, this is not a matter that we have any direct control over.

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[43] Submitter # 11.

[44] Submitter # 184.

[45] Submitter # 14.

[459] POL's noise expert, Mr Ballagh, predicted that, with the extension to the Multi-purpose Wharf, there would be a gradual increase in noise in Careys Bay over time as port cargo volumes increase. Based on the provisions of the Port Noise Mitigation Plan, Mr Ballagh predicted there would be up to 12 houses in Careys Bay that would need to be included in the sound insulation programme, with 2 to 3 of these having the option to upgrade their dwelling or have POL purchase their property.

[460] POL[46] pointed us to the RCP provisions contained within Chapter 12. Specifically, there is one objective that is relevant. Objective 12.3.1 is:

> *to manage and control noise levels within the coastal marine area to minimise any adverse effect on amenity values, conservation values and the use of the coastal marine area.*

[461] The RCP's single noise policy (Policy 12.4.1) points, among other things, to managing noise with particular regard to ensuring consistency with any noise control provisions or standards in any district plan for the adjacent land. There are no rules in the plan with respect to the management of noise. The plan states that the objective and policy contained within chapter 12 are to give guidance to the consideration of activities that require resource consents under any or all of the other chapters of the plan[47].

[462] A question was raised by us during the hearing as to whether or not consent is required under s.12(3) of the Act for operational activities within the CMA on the proposed Multi-purpose Wharf extension and fishing jetty, as distinct from the right to occupy required under s.12(2) of the Act. The relevance of this line of questioning was to determine whether or not there is a consent required to which conditions may be attached to control the effects of the operational activities such as noise, light spill and visual effects.

[463] In response, POL's counsel, Mr Andersen, submitted that s.12(3) of the Act is permissive. As there is no rule in the RCP, he considered there is no requirement for a consent for the activity, and that any activity could be carried out on the wharf structures. The ORC's Reporting Officer, Ms Watt, supported this view.

[464] To clarify the position further, we requested a legal opinion from ORC. In seeking this advice we asked that the opinion consider relevant case law. In particular, we noted the Planning Tribunal decision, *Paihia & District Citizens Association Inc. v Northland Regional*

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[46] Refer to the evidence of Mr Ballagh and Dr Mitchell.

[47] Refer to Section 12.5 of the Regional Plan: Coast for Otago (updated to December 2009).

Council (Decision # A77/95) and the Court of Appeal decision, *Port of Otago Limited v Hall and Stevens* (Decision # CA62/97). This case law focuses on the distinction between the requirement for authorisation to occupy the publicly owned CMA, and the authorisation of activities within the CMA. Furthermore, given there is no specific rule in the RCP with respect to s.12(3) of the Act, we asked for a consideration of the effect of s.87B(1)(a) of the Act in this circumstance. This provision relates to certain activities to be treated as discretionary or prohibited activities if, among other things, a resource consent is required under Part 3 of the Act and there is no relevant rule in a plan.

[465] ORC subsequently sought a legal opinion and this was duly provided by Mr Logan, a partner in the law firm of Ross Dowling Marquet Griffin[48]. The pertinent elements of Mr Logan's opinion are :

> *A coastal permit authorising occupation is necessary (unless the occupation is allowed by a national environmental standard or a regional rule) where, the occupation is reasonably necessary for another activity. Section 12(2) is therefore limited in scope to "occupation". Section 12(2) does not apply to the activity for which occupation of the CMA is necessary.*
>
> *Section 12(3) deals with activities in the coastal marine area which contravene a national environmental standard or a rule in a regional plan. Such activities are not permitted without a resource consent (unless Section 20A applies).*
>
> *The regional coastal plan for Otago contains no rules which come within Section 12(3). The rules deal with Section 12(1) and (2) matters: permitting some activities as of right and classifying others as controlled, discretionary and non-complying activities all of which require a resource consent.*
>
> *There are therefore no rules in the regional coastal plan which regulate activities which might take place on the wharf extension which POL proposes to construct and for which it has now applied for resource consent. In the absence of rules, no consent is required for these activities. The commercial port activities (and indeed other activities) may take place as of right.*

[48] Letter from AJ Logan of Ross Dowling Marquet Giffin to the Otago Regional Council titled "Port Otago Limited – Use of Wharf" 5 May 2011.

Activities such as the berthing and departure of ships, loading/unloading, embarkation and disembarkation of passengers, fuelling and other servicing of vessels and fishing, do not require resource consent.

No consent is required for any activities proposed to be carried out on the new wharf.

[466] We have relied on the legal opinion provided by ORC in our determination. As such, if consent is granted for the construction of the Multi-purpose Wharf extension and the fishing jetty, there is no other resource consent mechanism available to us to control the emission of noise from the operational activities. Reliance, therefore, falls on the existing mitigation provisions contained within the district plan.

[467] Having heard POL's and submitters' evidence, Ms Watt, the ORC Planning Officer, advised that she considered management of the operational noise should be dealt with through the provisions of DCC's District Plan (Rule 21.5.2), the Port Noise Management Plan and the Port Noise Mitigation Plan.

[468] To summarise our consideration of the effects of noise from the PNG proposal:

a) Dredging and construction noise would be at varying locations and limited duration. It will be subject to the New Zealand Standard, NZS 6803.

b) Construction noise management can be assisted through selecting the quietest practicable machinery and operating at times of the day and locations to minimise disruption.

c) Operational noise from the port is a matter that has been of particular concern to the residents in the vicinity of the port.

d) Consideration of these matters through Environment Court proceedings led to a settlement between POL and the local Careys Bay Association in 2004. The basis of the settlement was to rely on development of a Port Noise Management Plan and Port Noise Mitigation Plans that dealt with noise generated either side of the MHWS jurisdictional boundary.

e) A Port Noise Liaison Committee exists to implement the management and mitigation plans. The efficacy of the liaison committee is seriously questioned by members of the Careys Bay Association and community.

f) The RCP does not contain rules with respect to the management of noise. As such, we are advised that no coastal permit is required for operational port activities that may generate noise effects.

g) Ultimately, DCC has the responsibility for the control of the emission of noise and the mitigation of the effects of noise both within its district and, by virtue of a

transfer of powers, within the CMA. This is not a matter over which we have any direct control.

Visual impacts

[469] We were not presented with any expert evidence on the visual effects of the proposal. However, Mr Coe, for POL, did make a brief reference[49] to the effects of the proposal on visual values. In his opinion, the operation of dredging equipment would be in keeping with what is expected on the harbour, with shipping traffic and the ongoing maintenance dredging.

[470] Mr Coe commented on the visual context of the existing container terminal being dominated by a combination of container cranes, stacked containers, and vessels. He considered it essential for the port to be able to operate over the whole of the site in an integrated way and without restrictions on operations in certain or specific areas. He expressed concern that any restrictions may undermine the purpose of the Multi-purpose Wharf extension.

[471] A number of submitters from the Careys Bay and Deborah Bay communities raised concerns over the potential visual effects of the proposal, with particular reference to the berthing of larger vessels, stacking of containers and the use of container cranes. Some, particularly those resident in Careys Bay, expressed genuine and deeply felt concern for the way both the Multi-purpose Wharf and the fishing jetty would intrude into Careys Bay, which some likened to a Cornish fishing village. Undoubtedly, the two proposed structures would alter the vision seaward from the bay but this has not been given any legal protection. Ms Adams, on behalf of the Careys Bay Association, considered there had been little or no investigation or consultation over visual effects of the proposal. While we can sympathise with the residents, particularly those who have lived in Careys Bay for a long time, the change in the visual aspect of the bay does not, on its own, constitute grounds for us to decline consent.

[472] As discussed above with respect to the management of noise, POL have not applied for consent for the port activities on the wharf extension and do not consider this to be required. ORC's legal opinion on the need or otherwise for a s.12(3) (of the Act) consent also concluded that no consent is required for any activities proposed to be carried out on the new wharf. As such, this is also not a matter over which we have any direct control.

Light spill

[473] As with visual impacts, we were not presented with any expert evidence on the lighting effects of the proposal. In a similar vein, Mr Coe did touch briefly on the potential effects of

[49] Refer to paragraphs 226 to 231 of Mr Coe's evidence

port lighting. He considered adequate lighting to be a necessary part of providing a safe working port. Mr Coe noted that the zoning of the existing port is primarily within the Port 1 zone in the district plan.

[474] The area of the CMA in which the Multi-purpose Wharf extension is proposed is identified in the RCP as a Coastal Development Area , specifically CDA 4 Otago Harbour. The RCP requires that the values of commercial port facilities are recognised and regard given to providing for these values as appropriate.

[475] The site of the proposed Multi-purpose Wharf extension is also within the area of the occupation consent granted to POL by ORC for the purpose of operating and managing an existing port[50]. This consent superceded and expanded on the port occupation consent granted to POL by the Minister of Transport (under s.384(A) RMA) in 1994 and due to expire in 2026.

[476] The light spill effects of the Multi-purpose Wharf extension that have been raised as a concern by the local residents arise from the operational phase of the proposal. As discussed above with respect to the management of noise, POL has not applied for consent for the port activities on the wharf extension and do not consider this to be required. ORC's legal opinion on the need or otherwise of a s.12(3) RMA consent also concluded that no consent is required for any activities proposed to be carried out on the new wharf. Similarly, this is also not a matter over which we have any direct control.

6.8 Recreation and public access

[477] Recreation and, to some extent, public access, are closely allied to amenity values (s.7(c)) but we have considered the effects of the proposal on these matters above as a separate issue. In doing so, we are mindful that the *maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers* is recognized in s.6(d) of the Act, as a matter of national importance that we are required to *recognise and provide for.*

[478] POL produced very little by way of evidence at the hearing concerning recreation, other than considering the effects of spoil disposal offshore on wave breaks[51] and, thus, surfing, which we have discussed above in Section 6.3. Recreation was considered briefly in the AEE that accompanied the application[52]. Here, it was noted that Otago Harbour and its coastline are

[50] ORC Consent No: 2010.011was granted under delegated authority in March 2010 and extends the POL occupation to an are adjacent to the Boiler Point reclamation.

[51] Evidence of Dr Single at Para 144 *et seq*

[52] At 6.6: Recreation

important areas for recreational activities including boating, fishing, diving, surfing and swimming. It is important to recognise the potential impact of the proposed dredging and disposal operations on these recreational activities given that POL's operations share this natural resource with other users. The AEE dealt with each of these matters in turn and concluded as follows:

a) The main potential impact of the proposal in terms of recreational boating relates to navigational and safety matters. According to the AEE, since dredging and vessel movements already occur in the channel, the proposed activities would not result in any change in navigational procedures compared to the status quo. When the dredging is completed, a wider harbour channel would be available allowing for greater separation distances between recreational and commercial users of the channel. Therefore, any effects on recreational boating are expected to be similar or less than is currently experienced.

b) A number of rocky reefs and the area around the Mole are important for recreational divers and fishers. Waves and currents would disperse material that settles in these areas so any impacts on fish communities, fishing and diving in these areas are likely to be localised and short term.

c) The assessment of effects on the physical coastal environment concluded that there would be a small reduction in wave height at Aramoana Beach (approximately 0.01 metres). This would be a direct result of deepening the adjacent entrance channel to Otago Harbour. The assessment by Single et al (2010) concluded that the effects of the proposal on the offshore wave environment would be negligible at the shoreline.

d) Sediment dispersal from the A0 disposal site has already been assessed with the vast majority of sediment dispersing to the north as a result of the Southland current. Any sediment that reaches the Otago coastline would not be discernible to beach users. Accordingly, the surfing and swimming environment along the Otago coast would remain unchanged.

Surfing

[479] We have discussed POL's evidence regarding the effects of the proposal on surfing waves at 6.3 above. We note that, in his evidence at the hearing, Dr Single concluded[53] that the

[53] Dr Single's evidence at Para 145

placement of dredged sediment at site A0 would not significantly modify the offshore wave environment. Waves from the east and southeast, crossing the deeper harbour channel offshore of the end of the Mole, may be modified to a minor degree due to the deeper, wider channel configuration. However, the modelling results indicated that the surfability of the waves at Aramoana would not be compromised.

[480] As has already been noted, the potential effects on surfing at Aramoana, as well as the international recognition of the surf break and the recognition accorded this in the NZCPS (2010), were matters raised in many submissions[54]. The submitters' main concern was that the dumping of dredged spoil in Blueskin Bay would detrimentally alter the various surf breaks. Other fears were that dumping could affect water clarity and that there may be a release of contaminants, both of which could be a safety hazard to surfers.

[481] While there was some variance of opinion amongst the submitters at the hearing as to whether or not past dumping at one of the three existing spoil sites had improved the surf break at Aramoana, all were agreed that these existing sites were at capacity as far as the optimum sea bed conditions for surfing were concerned. Those who spoke to us at the hearing were of the opinion that any additional dumping at the present disposal sites would detrimentally affect the surf breaks. While this concern was understandable, we were not presented with any expert evidence that was contrary to the results of the considerable amount of modelling undertaken by POL.

[482] We recognise that a number of surfers who made submissions have observed the surf breaks for many years and that they have genuine concerns as to the effect further dumping of spoil might have on their sport. We are aware that POL, under its existing consents, could approximately double the amount it currently disposes at the inshore sites. The A0 site would be used for volumes above what is currently authorised. However, because POL has an existing consent to dump at the inshore sites we, in effect, have no jurisdiction in this matter. As we have already noted, however, this consent expires in December of this year and the question of what impact further dumping inshore may have on the surf breaks is a matter that we expect will be thoroughly canvassed as part of the consent renewal process.

Other recreational activities

[483] While some submitters were concerned about recreational fishing, diving and boating, these concerns mainly related to the effects of turbidity and navigational safety.

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[54] Submitters 6, 21, 35, 37, 36, 39, 45, 46, 51, 55, 57, 58, 73, 74, 81, 87, 88, 142, 143, 156, 157, 161, 164, 176, and 180.

[484] Recreational fishing within Otago Harbour could be locally curtailed when dredging is being undertaken and, although this would be a temporary inconvenience, we were given to understand that there would be no long-term detrimental effects.

[485] The harvesting of shellfish in the harbour, and along with kina and crayfish on the outer coast, could be impacted and we have discussed this more fully above in Section 6.5.

[486] In the event, we were not presented with any evidence to suggest that these activities would be compromised other than at times, on a temporary basis, when turbid conditions from dredging activities affected visibility and those who rely upon clear water would be affected. It is our view that potential adverse effects could be reduced to an acceptable level by the imposition of conditions, along with an adaptive environmental management plan, should the consents be granted.

[487] We do not consider that the natural features of Otago Harbour that are currently enjoyed by walkers and observers of nature would be significantly modified should the consents applied for be granted.

[488] The s.42A Report discussed recreation in some detail[55]. The report noted that Otago Harbour and the coastal environment are used for a number of water-based recreational activities, including: boating, fishing, diving and surfing.

[489] Recreational boating activity within Otago Harbour includes sailing, boating, kayaking and rowing, all of which feature prominently at various locations within the harbour. Recreational fishing in the coastal environment outside the harbour is also common. We were also told that there are seven yacht clubs within the harbour each of which undertake their own activities locally based around their respective club's location. Potential project issues identified by representatives of these clubs related to shallowing up of harbour areas, effects of the commercial use of the deepened cannel on recreational boating, as well as effects at moorings or on slips.

[490] The s.42A Report also referred to fishing in and around Otago Harbour, recreational diving and surfing. The importance given to the protection of recognised surf breaks in Policy 16 of NZCPS (2010) was also highlighted. We were informed that Schedule 1 of NZCPS lists the Spit, Karitane and Whareakeake as having nationally significant surf breaks. The report also noted that, since diving is a popular summer recreational activity around the Mole, it is

[55] S.42A Report at Para 203 *et seq*.

appropriate that capital dredging be restricted from occurring during the peak summer holiday period in this area.

[491] The s.42A Report concluded that, subject to conditions and the proposed EMP, the effects of the proposal on recreation would be no more than minor. We agree with this conclusion.

Public access

[492] We accept that public access to the completed fishing jetty may be restricted from time to time because of safety issues concerning port operations. However, it is apparent to us that the proposed fishing jetty is intended to improve public access to the CMA within the environs of Port Chalmers and would generally do so. We were not presented with any evidence to suggest that access to the CMA in Otago Harbour would be compromised, other than on a temporary basis when dredging operations could restrict boating and diving activities, and for safety reasons during construction of the Multi-purpose Wharf extension and the fishing jetty. We note that such restrictions as may be posed by dredging operations already exist.

6.9 Heritage values

[493] The protection of *historic heritage from inappropriate subdivision, use and development* is recognized in the Act, in s.6(f), as a matter of national importance that we are required to *recognise and provide for*.

[494] As all of the works, except for the extension of the Multi-purpose Wharf and construction of the fishing jetty are below high tide mark (and most of this is below low tide, there were little direct comments on heritage values.

[495] Historic structures that could be affected are the Pilot Wharf at Aramoana (sometimes referred to as the Spit Wharf), the Long Mac wall and other training structures or groynes in the outer part of the Lower Harbour. All are in disrepair and are apparently not needed by POL. Nor is it certain as to their ownership although it was suggested at the hearing that the derelict Pilot Wharf is the responsibility of DCC. Of these structures, those most likely to be affected, are the northern ends of the groynes near Ōtākou. However, as sufficient parts of the groynes will remain, we do not consider that this, in itself, justifies declining consent to widen and deepen the shipping channel. Also if consents are granted then, as the groynes were presumably constructed before 1900, permission to remove any part of them would need to be obtained under the Historic Places Act.

[496] We note that it is common practice in New Zealand that consents are granted with conditions that require the consent holder to cease operations and consult with the relevant authorities if koiwi tangata, Maori artefacts or other archaeological or historical features are discovered. Such a condition has been proposed.

[497] Concern was expressed during the hearing that the slumping of the new cut face arising from widening and deepening the channel could impact on the Pilot Wharf and the Long Mac wall. While this is speculative, we note that the POL has agreed to the inclusion of a condition of consent requiring an assessment of the Long Mac wall if dredging is to occur within 200 m of it[56] This has been fully discussed in Ms Watt's evidence of 19 April 2011[57]. We also understand that POL has proposed that new channel embankments would be cut to resemble existing slopes in order to minimise potential slumping.

[498] We are satisfied that any adverse effects on heritage values would be no more than minor.

6.10 Traffic

[499] It is generally acknowledged that the traffic generated during the construction phase of a project such as this, which involves wharf construction, has the potential to create adverse environmental effects. Here, it is mostly the effect of project traffic on the environment that we need to consider rather than the effect of the proposal on traffic *per se* although there could be some inconvenience to other road users, at times.

[500] Port Chalmers is on the South Island Main Trunk Railway and thus there is good rail access to much of the South and North islands. The port is also the terminus of State Highway 88 which follows the northern shoreline of the harbour westwards to Anzac Avenue in Dunedin where it joins State Highway 1, the major highway in the east of the South Island. There is currently a proposal to realign parts of SH 88.

[501] POL has assessed that the existing land transport networks are adequate to service the port and no substantiated evidence to the contrary was presented to us to show that, either the rail or road access was currently deficient, or that it would not be able to cope with increased traffic that could arise from the proposal. We note that one submitter[58] was of the opinion that

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[56] 2010.193 22A

[57] Para 24 onwards

[58] Mr D Humphrey (No 90)

any perceived problems with the present highway were due to inadequate policing rather than the road itself. If traffic on the highway increases to such an extent that upgrading is required, then, as with any state highway, there are procedures in place as to how and when this would occur.

[502] According to POL, while the container yard at Port Chalmers is relatively small, it is adequate. Furthermore, if there is a significant increase in container traffic there is always the possibility that the port can be fed from a dedicated container yard distant from the port.

[503] Consequently, we did not believe that the rail and road access to and from Port Chalmers is a matter that needs to be further considered in our deliberations as to whether the applications should be granted or not.

6.11 Commercial fisheries

[504] During the hearing the greatest number of submissions in opposition, after perhaps those from residents living at and near Port Chalmers, was from commercial fishers, including those harvesting shellfish and crayfish. Their concerns fell into three major categories:

a) the direct effects of dumping spoil in Blueskin Bay, particularly at the A0 site;

b) indirect effects of fine-grained material (silt and clay) being winnowed from the dump sites and affecting the rocky coastal areas that are the habitat of shellfish and crayfish, or are the nursery for other commercial fish species; and

c) the cockle beds in Otago Harbour.

[505] There was no dispute at the hearing that the dumping of dredge spoil at the A0 site would smother the benthic communities on the seabed below. Consequently, the affected area would not attract pelagic fish as at present, although there could be some opportunistic species attracted by any food that may be in the material being dumped.

[506] Mr Boyd, in his evidence for POL, stated that Blueskin Bay is part of a much larger fishery and, therefore, any activities such as dumping of spoil at A0 would have little effect on fish stocks in the coastal Otago area. This may well be so but, from a significant number of submissions, it is clear that Blueskin Bay is an important trawl fishery. This is especially so for so-called “day fishermen”, who work out of Otago Harbour and supply fresh fish to Dunedin and other markets. While evidence at the hearing was rather sparse, we are satisfied that the day fishers do trawl across the A0 site depending on, from years of practical experience, whether or not they perceive it to be worthwhile for them to do so.

[507] If the trawlers have to go greater distances because the A0 area is unavailable for trawling, then this would add extra time to trips and, more importantly from a commercial perspective, use extra fuel and, therefore, costs would be increased.

[508] It is unfortunate that more information on the extent of commercial fishing in Blueskin Bay, and at the A0 site in particular, was not forthcoming. Whether the Ministry of Fisheries would have been able to assist in this matter is not known as, despite stating they wished to be heard, they did not in actual fact do so. Nevertheless, we heard from both Mr Boyd and also some of the commercial fisherman that the industry is tightly regulated. Also we were shown, by one fisherman, trawl lines crossing the A0 site.

[509] While the fishermen were critical of POL for not being more open with them, it is often the case that the fishermen themselves are reluctant to divulge information. What the circumstances were, as far as the relationship between POL and commercial fishers is concerned, we are not able to judge.

Sediment movement from the A0 site, Blueskin Bay

[510] The A0 site is on the submerged Peninsula Spit that extends NNE from Taiaroa Head and, therefore, is within an area of natural sedimentation for some of the sand that is being transported north by the Southland Current. We were given to understand that, once disposal at A0 ceases then, according to scientific evidence given at the hearing, the benthic communities would recover.

[511] We acknowledge that great reliance is being placed on the modelling of the A0 site that was undertaken by NIWA on behalf of POL, and which was peer reviewed by Tonkin & Taylor for POL and by the University of Otago on behalf of ORC. Given the extensive monitoring that is proposed we find that reliance on the modelling is not an unreasonable proposition. The modelling strongly shows that, although some of the coarser-grained material would spread northwards, it would not enter the inshore waters.

[512] The modelling also shows that only negligible amounts of fines would migrate into the inshore areas and, therefore, they would not pose a risk to the rocky habitats, including the *Macrocystis* beds, and the commercial fisheries that depend on them. Similarly, the fines would not significantly add to the "bog hole", which is an area of mud in the core of the Blueskin Bay gyre and which cannot, on the evidence of several of the commercial fishermen, be trawled.

[513] Nevertheless, to be certain that detrimental effects would not occur should consent for the A0 site be granted, it is important that a rigorous monitoring programme is initiated prior to the dumping of spoil commencing. It is equally vital that this be coupled with an EMP that is

sufficiently adaptive so that any potentially detrimental effects can be recognised early, and measures quickly implemented to forestall and minimise these effects.

[514] We accept that dumping at the A0 site would be an imposition on the commercial fishers who trawl in this area but we do not consider that this, in itself, is a sufficient reason to decline the granting of consent. It, thus, becomes one of a number of effects, both positive and negative, left for us to consider when we come to make our overall evaluation of the proposal.

[515] In order to reduce the inconvenience and possible imposition of extra costs on the commercial fishing industry, as well as to minimise the potential for adverse impacts on the commercial fisheries in Blueskin Bay, we are of the view that a representative of the local fishers, with appropriate marine science expertise, should be invited to be a member of the Technical Group.

Inshore spoil disposal sites

[516] The three existing inshore spoil sites are not part of the current applications that we are considering other than the variation [to the conditions of Coastal Permit 2000.72] sought by POL so that some of the spoil from the proposed Incremental Capital Dredging can be disposed at these sites.

[517] Currently, the inshore sites are receiving about half the amount of spoil that has been consented. No effects on commercial fisheries from spoil disposal at these sites were brought to our attention.

Cockle beds

[518] The cockle beds in Otago Harbour are a significant resource, not only to SCL, which is operating commercially under a special permit from the Ministry of Fisheries, but also to the tangata whenua of Otago Harbour, and recreational users. While some cockle beds would be directly affected by widening the channel and, particularly, the swinging basin, the greatest potential threat would arise from fine-grained suspended sediments released into the water column from the area adjacent to Port Chalmers. In addition, there would be some dredging into areas that have not formerly been dredged and this would involve intertidal sediments.

[519] Despite these concerns, we are of the opinion that, with strict conditions governing such matters as suspended sediment levels, turbidity, dredging methods and timing, coupled with monitoring and the use of an adaptive environmental management plan, the risk to the cockle beds, and the other organisms that inhabit the harbour, can be reduced to an acceptable level.

6.12 Climate Change

[520] The need to have particular regard to *the effects of climate change* was introduced (s.7(i)) into the Act in the March 2004 energy and climate change amendments. We note that the courts[59] have since established that s.7(i) is principally aimed at considering the effects of climate change on the proposal rather than the reverse.

[521] In having regard to the effects of climate change we note that there was no evidence presented to us to suggest that the PNG proposal would be affected by climate change. Neither was there any evidence put before us that to indicate that the proposal would have any effect on climate change.

6.13 The economy

[522] The enabling of *people and communities to provide for their social, economic, and cultural well-being and for their health and safety* is a s.5 matter and, insofar as it is part of the meaning of 'sustainable management' it is, therefore, part of the fundamental purpose of the Act. The *efficient use and development of natural and physical resources* is also a relevant consideration under s.7(b).

[523] Evidence concerning relevant economic matters, on behalf of POL, was provided by Mr Geoffrey Butcher. He specifically covered:

a) the financial costs and benefits arising from the proposal;

b) the economic impact on the Otago Region, in terms of employment and income; and provided

c) a brief comment on other economic effects of the proposal including efficiency of resource use.

[524] Mr Butcher noted that his economic analysis was limited by uncertainties attached to future freight volumes and shipping rates, and also questions regarding the development of the port at Lyttelton. In his Cost Benefit Analysis (**CBA**) he adopted a conservative "Lyttelton Developed" scenario, which assumed that Lyttelton has already been developed to cope with 6,000 TEU ships. He also assumed that the ports at Auckland or Tauranga would also be capable of handling 6,000 TEU ships. He pointed out to us a number of strategic advantages in having more than one major port in the South Island.

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[59] *Upland Landscape Protection Soc Inc v Clutha DC* Env Ct C085/08.

[525] The results of Mr Butcher's analysis showed that the development of Port Chalmers would provide benefits, via reduced freight costs, of $16.9 million per year for 2008 cargo volumes rising to $49.1 million per year by 2028 based on forecast cargo volumes. He said this stream of annual benefits has a Net Present Value (**NPV**) of $264 million. Allowing for the cost of developing Port Chalmers, as proposed, the NPV is expected to be $202 million assuming Lyttelton has been developed. If Lyttelton was not developed, Mr Butcher considered the NPV would increase to $1,210 million over the next 20 years.

[526] Mr Butcher also considered the economic impacts of not deepening the harbour channel. He estimated that if the proposed PNG proposal does not proceed, then within twenty years the regional economy would lose a significant amount of economic activity including more than 890 jobs and an associated $107 million/year of regional income, including $50 million per year of wages and salaries. He went on to say that changes to transport costs and freight convenience brought about by cargo having to move through Lyttelton or Auckland for final export on larger vessels would significantly affect Otago and Southland's cost-competitiveness.

[527] Although some submitters[60] expressed concern about the economic rationale for the project and the prospect of adverse economic effects, Mr Butcher's evidence on economic matters was not seriously questioned. On the other hand, slightly more submitters[61] supported the proposal on economic grounds. Many also noted that, if the port's premier position as a key link in New Zealand's international supply chain is to be maintained, the port must be able to handle larger ships.

[528] The s.42A Planning Report pointed out to us that, aside from the development costs, other economic factors included interference with shipping operations and the impact on commercial fishing and aquaculture. The report accepted that the proposal is critical to the economic well-being of the Otago region and is consistent with both the RPS and the RCP. The commercial benefits from deepening Port Chalmers as assessed by Mr Butcher were also accepted.

[529] POL has cited a range of benefits, mainly economic, that would accrue from the PNG proposal if it proceeds. Having heard the evidence, we were left in little doubt that upgrading Port Chalmers, and the channel leading to it, in order to cater for future shipping demands

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[60] Submitter Nos: 45, 99, 105, 121, 131, 140, 147 and 156

[61] Submitter Nos: 4, 15, 53, 90, 103, 116, 120, 123, 148 and 177

would have significant benefits. In the event that we grant consent, it is apparent to us that the proposal would enable the Otago community to provide for its economic well-being.

7 MAIN FINDINGS OF FACT

[530] Throughout the preceding Section 6 we have examined the effects of the proposal on a range of matters that were brought before us in evidence and submissions. In the table that follows we have, for convenience, summarized our findings with respect to each of these issues.

Summary of main findings

Effect of proposal on	Our findings	RMA
Tangata whenua	On-going consultation would ensure that Maori would not be adversely affected by more than a minor extent.	s.6(e), s.6(g), s.7(a), s.7(aa) s.8
Hydrodynamics and sediment processes	Monitoring and adaptive management would ensure that the effects would be no more than minor.	
Water quality	The effects are considered to be minor subject to appropriate conditions, which provide for adaptive management in the EMP.	s.107
Ecology	There would be short to medium-term effects on marine biota as a result of dredging activities. While there remains a degree of uncertainty concerning the effects on benthic ecology, it is acknowledged that this can be managed using the adaptive management provisions contained in the EMP.	s.6(d), s.7(d), s.7(h)
Natural character and landscape	These values would not be compromised by the proposal.	s.6(a), s.6(b), s.7(c)
Amenity values	Impacts on amenity values (noise, visual and lighting) arise from port operations the effects of which are not germane to this application. Conditions can be imposed to control those that occur during construction.	s.7(c)
Recreation and public access	Effects on recreation would be no more than minor and provision of a public fishing jetty would enhance public access to the CMA.	s.7(c), s.6(d)
Heritage values	Effects less than minor.	s.6(f)
Traffic	Effects less than minor.	s.7(c)

Climate change	No impact.	s.7(i)
The economy	Net economic benefits identified.	s.5(2)

8 STATUTORY PROVISIONS

8.1 Overview

[531] In the evidence and submissions we heard, helpful guidance as to the statutory criteria that we are required to apply, and the various parts of the particular plans and policy statements that are relevant to the application, were provided by POL and in the s.42A Planning Report.

[532] The following submitters also provided constructive analyses and brought particular statutory provisions to our attentions:

- Ms Williams, who appeared as Counsel for the Director General of Conservation[62];
- Mr Vial in his submission[63] on behalf of Kāti Huirapa Rūnaka ki Puketeraki and Te Rūnanga o Ōtākou;
- Mr Bryce on behalf of the collective fisheries group[64]; and
- the East Otago Taiāpure Management Committee[65].

[533] The statutory provisions relevant to this application under Part 6 of the Act are:

- s.104, which provides the relevant matters to be considered;
- s.105, which sets out the requirements for discharge permits; and
- s.107, which places restrictions on the grant of certain discharge permits.

In addition, s.104B allows us, after considering an application for a discretionary activity or a non-complying activity, to grant or refuse consent and, if granted, to impose conditions under s.108.

[62] Refer Para 213 *et seq*.

[63] Refer Para 138 *et seq*.

[64] Refer Para 141 *et seq.*

[65] Refer Para 164 *et seq*

8.2 Part 2 [RMA]

[534] S.104, which provides a suite of matters that are to be considered before a decision is made on a resource consent application, places Part 2 of the Act as the primary matter for consideration. Everything in s.104 is subject to Part 2.

[535] S.5 (Part 2) of the Act states:

> *(1) The purpose of the Act is to promote the sustainable management of natural and physical resources.*
>
> *(2) In this Act "sustainable management" means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while -*
>
> *(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
>
> *(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

[536] S.5(1) contains the very essence of the Act. In arriving at a decision we are bound to determine whether or not the proposal, overall, is consistent with this single purpose of the Act. In doing so, we are able to make an overall judgement in weighing up both the positive and negative aspects of the proposal. Before we are able do so, however, the sustainable management aspects of the proposal must be considered in light of s.5(2) in conjunction with a range of other matters in Part 2.

[537] S.6 of the Act is concerned with matters of national importance that this decision is required to recognize and provide for in relation to managing the use, development and protection of natural and physical resources.

[538] s.6(a*) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:* In Section 6 of this decision we have examined the effects of the proposal on the natural character on the coastal environment. Here, we have concluded that the effects would be less than minor.

[539] s.6(b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development:* We have considered outstanding natural features and landscapes (ONFL) in Section 6.6 of this decision. The RCP identifies three ONFLs in the vicinity of the proposed dredging and we have concluded that these would not be affected by the proposal.

[540] s.6(c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:* After considering the evidence concerning the effects of the proposal on the benthic ecology of Otago Harbour and the proposed disposal site at A0 in some detail in Section 6.5, we concluded that conditions can be imposed to ensure that the effects would be no more than minor.

[541] s.6(d) *The maintenance and enhancement of public access to and along the coastal marine area, lakes and rivers:* We have concluded in Section 6.8 that public access would be enhanced by the proposal.

[542] s.6(e*) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:* This has been considered in Section 6.2 where we concluded that the culture and traditions of tangata whenua would not be adversely affected by the proposal.

[543] s.6(f) *The protection of historic heritage from inappropriate subdivision, use and development:* We have concluded that any adverse effects on heritage values would be less than minor.

[544] s.6(g) *The protection of recognised customary activities:* No such activities were identified.

[545] Other matters that this decision is required to have particular regard to are provided in s.7 of the Act.

[546] s.7(a) *Kaitiakitanga:* Issues relating to *tangata whenua* were canvassed in Section 6.2. We are satisfied that on-going consultation with iwi would ensure that *kaitiakitanga* would not be adversely affected by the proposal.

[547] s.7(aa) *The ethic of stewardship:* Aside from iwi stewardship (*kaitiakitanga*), which we have concluded would not be affected, a condition requiring consultation with NZ Historic Places Trust concerning the care of heritage items would ensure that the ethic of stewardship is not compromised.

[548] s.7(b*) The efficient use and development of natural and physical resources:* The deepening of the harbour channel to allow for future shipping would assist the Otago community to provide for its economic well-being and is consistent with s.7(b).

[549] s.7(ba) *The efficiency of the end use of energy:* Not relevant.

[550] s.7(c*) The maintenance and enhancement of amenity values:* In Section 6.7 we have examined the effects of the proposal on amenity values as affected by noise, light spill, and visual amenity. We concluded that effects on amenity values during the construction phase would be no more than minor, and that those arising from port operations are not matters within our jurisdiction.

[551] s.7(d) *Intrinsic value of ecosystems:* We have had regard to ecosystems in Section 6.5 and have determined that conditions can be imposed to ensure that the effects would be no more than minor.

[552] s.7(e*)* Repealed.

[553] s.7(f) *Maintenance and enhancement of the quality of the environment:* We have had regard to the effects of the proposal on the quality of the environment throughout Section 6 of this decision and have concluded that the quality of the environment would be maintained.

[554] s.7(g*) Any finite characteristics of natural and physical resources:* No finite characteristics of natural and physical resourcces were brought to our attention.

[555] s.7(h) *The protection of the habitat of trout and salmon:* No adverse effects on trout or salmon were brought to our attention.

[556] s.7(i) *The effects of climate change:* We have had regard to the effects of climate change in Section 6.12 where we concluded that the proposal would not be affected by climate change.

[557] s.7(j) *The benefits to be derived from the use and development of renewable energy:* Not applicable.

[558] S.8 *Principles of the Treaty of Waitangi (Te Tiriti o Waitangi):* The effects of the proposal on tangata whenua has been examined in Section 6.2. We have concluded that Treaty of Waitangi principles would not be compromised by this proposal.

8.3 Section 104 [RMA]

[559] S.104 provides a suite of matters to be considered and these are listed in sub-sections (1) to (5).

[560] s.104(1) states*:*

> *When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to —*
>
> *(a) any actual and potential effects on the environment of allowing the activity; and*
>
> *(b) any relevant provisions of –*
>
> *(i) a national environmental standard;*
>
> *(ii) other regulations;*
>
> *(iii) a national policy statement;*
>
> *(iv) a New Zealand coastal policy statement;*
>
> *(v) a regional policy statement or proposed regional policy statement;*
>
> *(vi) a plan or proposed plan; and*
>
> *(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

[561] s.104(1)(a): *any actual and potential effects on the environment of allowing the activity*; The key issues concerning the actual and potential effects on the environment that would result from granting the application have been identified and examined in Section 6 of this decision. A summary of our findings is provided in Section 7.

[562] s.104(1)(b)(i): *any relevant provisions of a national environmental standard:* No particular provisions of a national environmental standard, to which we must have regard, were brought to our attention.

[563] s.104(1)(b)(ii): *any relevant provisions of other regulations:* No other relevant provisions of other regulations were brought to our attention.

[564] s.104(1)(b)(iii): *any relevant provisions of a national policy statement:* Apart from the New Zealand Coastal Policy Statement 2010 (**NZCPS**), which we consider below, no other national policy statement was brought to our attention.

[565] s.104(1)(b)(iv): *any relevant provisions of a New Zealand Coastal Policy Statement*: Both POL[66], and the s.42A Planning Report in Section 8.2.2, provided a detailed analysis of the relevant provisions in the NZCPS. Helpful guidance was also provided by Ms Williams (DOC) who submitted that the proposed conditions would satisfy the relevant policies in the NZCPS. We note that these analyses were generally in agreement and we accept that the proposal is consistent with the New Zealand Coastal Policy Statement 2010.

[566] s.104(1)(b)(v): *any relevant provisions of a regional policy statement or proposed regional policy statement*: The Regional Policy Statement for Otago (**RPS**) is relevant and the provisions germane to this proposal were helpfully set out in Section 8.2.3 of the s.42A Planning Report. Here, it was noted that the RPS provides an overview of Otago's resource management issues, and ways of achieving integrated management of natural and physical resources. The provisions of Chapter 4 (Manawhenua Perspective), Coast (Section 8) and Built Environment (Section 9) are relevant to this application. We note that both Dr Mitchell, who provided planning evidence on behalf of POL, and the officers responsible for the s.42A Report, concluded that the proposal is consistent with the policy directions in the RPS. We accept their findings.

[567] s.104(1)(b)(vi): *any relevant provisions of a plan or proposed plan*: The Regional Plan: Coast for Otago (**RCP**) was identified as relevant. Again, both Dr Mitchell (for POL) and the authors of the s.42A Report provided a detailed analysis of the policies and objectives in the RCP that are relevant to this proposal. Section 8.2.4 of the s.42A Report identified Chapter 5: Coastal Management; Chapter 7: Public Access and Occupation of space; Chapter 8: Structures; Chapter 9: Alteration of the Foreshore and Seabed; Chapter 10: Discharges; Chapter 12: Noise; Chapter 13: Exotic Plants; and Chapter 14: Natural Hazards, all as being relevant to this proposal. We note that Dr Mitchell added Cross Boundary Issues in Chapter 6 to this list. Both analyses were generally in agreement and we accept the conclusion that the proposal is consistent with the objectives and policies of the RCP.

[568] s.104(1)(c): *any other matter the consent authority considers relevant and reasonably necessary to determine the application*: Both POL, in Dr Mitchell's evidence, and the s.42A Planning Report identified the following other matters to which we should have regard:

- Kai Tahu Ki Otago Natural Resource Management Plan 2005: This plan outlines natural resources of importance to Kai Tahu. The CMA is one of the areas Kai

[66] Evidence of P Mitchell at Para 3.12 *et seq*

Tahu seeks to preserve and protect. We accept the conclusion in the s.42A Report that the proposal is not inconsistent with the policies contained within this plan.

- The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention) and the 1996 London Protocol: The main objective of the London Convention is to prevent indiscriminate disposal at sea of wastes that could be liable for creating hazards to human health; harming living resources and marine life; damaging amenities; or interfering with other legitimate uses of the sea. The proposal is not inconsistent with this objective.
- The New Zealand Guidelines for Sea Disposal of Waste: The s.42A Report states that these guidelines are New Zealand's way of giving effect to the London Convention (1972), and the 1996 London Protocol. We accept the view expressed by both POL and in the s.42A Report that the dumping of dredge spoil, in the manner proposed, is consistent with these guidelines.

8.4 Section 105 [RMA]

[569] s.105: Matters relevant to certain applications, states:

> *(1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to –*
>
> *(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
>
> *(b) the applicant's reasons for the proposed choice; and*
>
> *(c) any possible alternative methods of discharge, including discharge into any other receiving environment.*
>
> *(2) If an application is for a resource consent for a reclamation, the consent authority must, in addition to the matters in section 104(1), consider whether an esplanade reserve or esplanade strip is appropriate and, if so, impose a condition under section 108(2)(g) on the resource consent.*

[570] We have considered the provisions of s.105 and are satisfied that there are no other viable options that the applicant could pursue in order to undertake this activity. In Section 6 we have considered the nature of the discharges and have determined that conditions can be imposed so that the discharges resulting from the dredging activities would not have an adverse effect on the receiving environment.

8.5 Section 107 [RMA]

[571] S.107: Restriction on grant of certain discharge permits, states:

> *(1) Except as provided in subsection (2), a consent authority shall not grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A allowing—*
>
> *(a) the discharge of a contaminant or water into water; or*
>
> *(b) a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or*
>
> *(ba) the dumping in the coastal marine area from any ship, aircraft, or offshore installation of any waste or other matter that is a contaminant,—*
>
> *if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:*
>
> *(c) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:*
>
> *(d) any conspicuous change in the colour or visual clarity:*
>
> *(e) any emission of objectionable odour:*
>
> *(f) the rendering of fresh water unsuitable for consumption by farm animals:*
>
> *(g) any significant adverse effects on aquatic life.*
>
> *(2) A consent authority may grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A that may allow any of the effects described in subsection (1) if it is satisfied—*
>
> *(a) that exceptional circumstances justify the granting of the permit; or*
>
> *(b) that the discharge is of a temporary nature; or*
>
> *(c) that the discharge is associated with necessary maintenance work—*
>
> *and that it is consistent with the purpose of this Act to do so.*
>
> *(3) In addition to any other conditions imposed under this Act, a discharge permit or coastal permit may include conditions requiring the holder of the permit to undertake such works in such stages throughout the term of the permit as will ensure that upon the expiry of the permit the holder can meet the requirements of subsection (1) and of any relevant regional rules.*

[572] In terms of our ability to grant consent where discharges are concerned, as is the case before us, s.107 is potentially quite restrictive. We were surprised to find that this section of the

Act had been given scant attention in both the application and in the evidence presented to us at the hearing, and neither was s.107 discussed in the s.42A Report. We queried this omission towards the end of the hearing and both Ms Watt (as the reporting officer on behalf of ORC) and Mr Andersen, in his right of reply, subsequently addressed s.107.

[573] Ms Watt told us that s.107 had not been considered in the s.42A Report as it was not considered relevant. She went on to say:

> *Section 107 applies when something will contravene section 15 or 15A of the Resource Management Act. The discharge of contaminants from ships is governed by section 15B and not 15 or 15A.*

[574] We note that s.15A (in s.15A(1)(a)) does appear to be relevant to discharges or dumping from ships.

[575] Mr Andersen said Sections 15, 15A and 15B were relevant in considering s.107. Although not specifically mentioned in s.107, we agree that s.15B is relevant in any case.

[576] Mr Andersen went on to say that the wide definitions of contaminants and waste mean the applications could arguably breach the following sections without a resource consent:

a) The decant water from the dredge could breach s.15 and s.15B.

b) The disposal of the soil could breach s.15 and s.15A.

c) Discharges from the construction of the wharf could breach s.15.

[577] Having given some consideration to this matter, we accept Mr Andersen's view that s.107 is designed to protect water quality and there is nothing in the consents applied for that is a threat to water quality after reasonable mixing. He went on to say that it is a well-established law that what constitutes reasonable mixing requires a case by case evaluation of all the relevant facts that exist. In this case, it is apparent from the evidence that the predicted levels of turbidity would have no significant adverse effects, and such effects would be localised and temporary.

[578] We also think it can be argued that the discharges from the proposed dredging activities would be episodic and would not carry on beyond the construction period. In this sense the discharges might also be considered as being of a temporary nature (s.107(2)(b)). In any case, we have accepted the evidence from POL that, subject to conditions and adaptive management through the EMP, the effects of the discharges would be no more than minor.

[579] We, thus, consider, that s.107 does not prevent us from granting consent.

9 DETERMINATION

9.1 Decision

[580] Having carefully considered all the relevant reports and documentation supplied with the application, submissions, and the evidence presented to us during the course of the hearing, we have determined that Port Otago Limited has made its case for allowing the works associated with Project Next Generation, and that the scheme is consistent with the sustainable management of natural and physical resources and should be allowed to proceed, as proposed, subject to the imposition of conditions.

[581] In terms of s.113(1)(a) of the Act we are required to give reasons for our decision. Throughout Section 6 of this decision we have gone to some trouble to examine the evidence and canvass all the environmental effects that were brought to our attention. We have drawn our own conclusions as to how each of these issues impacts on our decision and our reasons are discussed further below.

[582] For the reasons given, therefore, in exercising the powers delegated to us by Otago Regional Council, we have resolved:

a) to grant resource consent applications (2010.193-200; 2010.202-203; and RM.10.193.01) sought by Port Otago Limited, pursuant to s.104 of the Resource Management Act 1991; and

b) to grant the application to vary Resource Consent 2000.472 (2000.472-V1) sought by Port Otago Limited, pursuant to s.127 of the Resource Management Act 1991.

[583] We have also resolved to grant the consents for the terms sought in the application and as set out in the s.42A Planning Report.

[584] In accordance with s.108, conditions have been attached to these consents (Volume 2). In doing so, we have largely accepted the draft conditions that were proposed by Port Otago Limited and which were appended to the s.42A Planning Report. We note that these have evolved as a result of discussions with the Department of Conservation and others, and the draft has been amended during the hearing. We record that a number of conditions were suggested by some submitters and we have taken these into account in arriving at the final conditions.

9.2 Reasons

[585] In exercising our discretion, we are bound to keep in mind Part 2 of the Act and, particularly, the single broad purpose as set out in s.5. It is in terms of this section that we are

required to make an overall judgement and determine whether or not the proposal promotes the sustainable management of natural and physical resources. It is now well-established that the subsequent sections in Part 2 (s.6, s.7 and s.8) provide a range of factors to be considered in making this judgement but, on their own, they must not be allowed to obscure the fundamental purpose of sustainable management.

[586] In deciding whether or not to grant consent, we believe we have been properly guided by the requirements of Part 2 of the Act and s.5, in particular. In Section 6 of this decision we have canvassed in detail all the effects of the proposal that were brought to our attention, and in Section 8 we have presented our analysis of the ways in which the statutory provisions have been applied. We have found, in our examination of the statutory matters in Section 8, that the proposal is generally consistent with all provisions that we are required to consider under s.104.

[587] It a was matter of some importance to us that, despite the fact that Port Chalmers is clearly a major infrastructural asset of importance, not only to the Otago region but also nationally and its need to be able to develop in concert with shipping demands is paramount, the proposal attracted almost 200 submissions of which a significant majority (75%) opposed the application.

[588] Opposition to the proposal extended from partial to total but the main concerns focused in one way or another on the effects of sedimentation on a wide range of marine biota both in Otago Harbour and offshore; the effects of spoil disposal offshore and channel deepening on the nationally-recognised surf breaks at Aramoana; and the effects of noise from port operations at Port Chalmers on local residents. Following legal advice, which we sought from Otago Regional Council, we concluded that port noise was a matter covered by the District Plan and was not something over which we are able to excercise any control as part of this consent process.

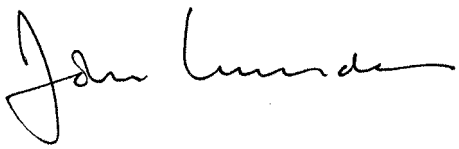
[589] It is fair to say that many submitters who opposed the application did recognise the importance of the port and its need to be able to grow. These submitters mostly sought to have appropriate conditions to minimise or mitigate adverse effects, along with requirements for ongoing monitoring, attached to any consents granted.

[590] Nevertheless, it was significant to us that the assessments (i.e., the predicted outcomes) concerning the main points at issue within our jurisdiction, namely, the effects of sedimentation on ecology, and the effects on waves passing over a deepened channel and spoil disposal sites, were almost entirely dependent on the hydrodynamic modelling undertaken by Port Otago Limited and submitted with the application. There was a good deal of suspicion about how much reliance can be placed on the modelling that had been undertaken. This was not

surprising given that such modelling is, effectively, only a mathematical representation of what might be expected to happen in practice and, moreover, its importance in predicting the most significant effects of the proposal.

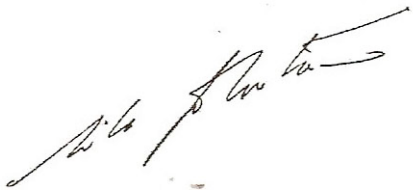
[591] In accepting the modelling evidence we have recognised that the model used is internationally accepted and that the work was twice peer-reviewed and considered fit for the task. However, the prime reason for our acceptance is that an extensive programme of sediment plume monitoring has been proposed as part of an adaptive environmental management plan to enable any adverse effects from sediment movement and/or deposition to be identified and appropriate action taken. In this way, we are satisfied that the effects of sedimentation can be avoided, remedied or mitigated. We have come to the same conclusion with respect to the effects of spoil disposal offshore at the A0 site and channel deepening on waves at Aramoana.

[592] In deciding to grant the consents sought we are also mindful that the port, along with channel dredging, has been has been in existence for close to 150 years and no serious evidence of adverse effects occurring in that time, as a result of port operations, were brought to our attention.



John Lumsden (Chair)

Hugh Leersnyder



Dr Michael Johnston

Dated this 17th day of June 2011.

10 APPENDICES

Appendix 1: Photographs, maps and plans

Figure 1: Otago Harbour showing main features [Source: Google Earth, July 2009][67]

[67] Evidence of R Bell (p58)

Figure 2: The coastal area off the entrance to Otago Harbour showing the main geographical features and the proposed disposal site at A0.

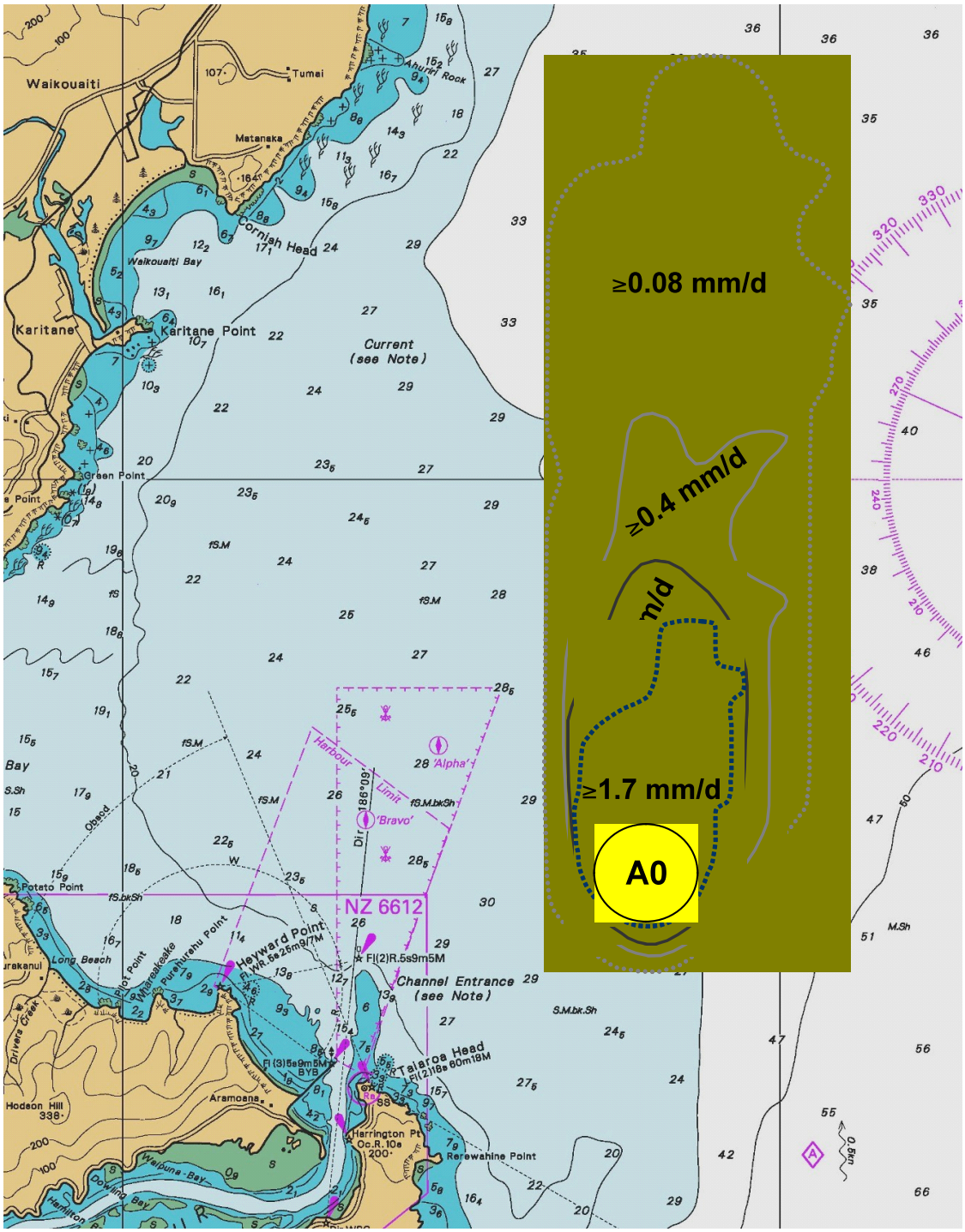


Figure 3: Zones within which various average deposition rates (mm per day) are exceeded for all sand/silt fractions from the disposal plume modelling over the entire dredging programme solely using a moderate-size TSHD[68].

[68] Source of background map: Chart NZ661, LINZ]. Source of Figure: Figure 11.22, from the 2009 NIWA Modelling report, Technical Report 10.

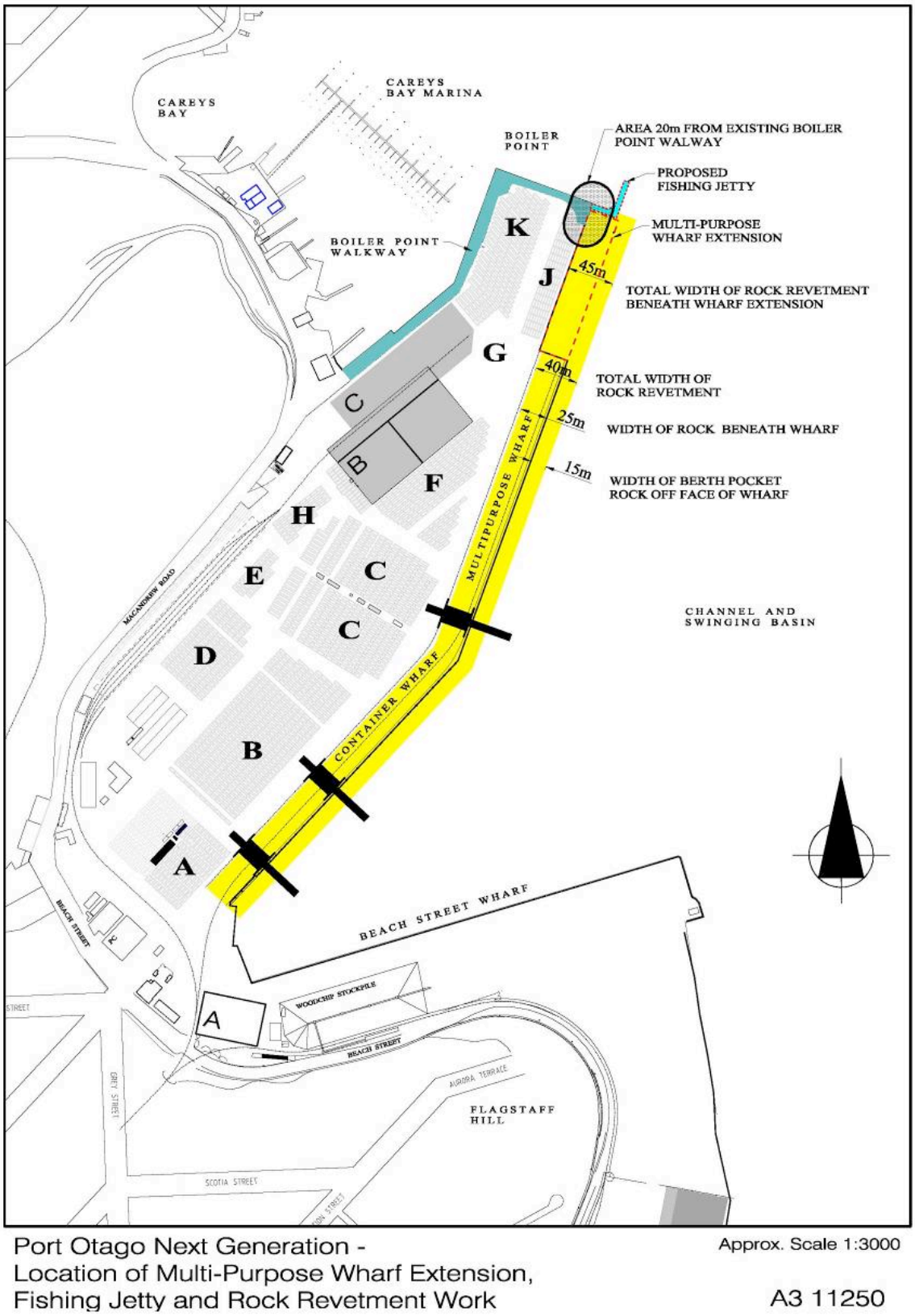


Figure 4: Plan of Port Chalmers as proposed

Appendix 2: List of submitters

Submitter No	Name	Support or Oppose	Main points raised in submission
1	Kati Huirapa Runaka ki Puketeraki	Opposed	Concerns with the dredging of material from the foreshore, seabed and disposal of dredge material as have effects on cultural, spiritual, historic and traditional relationship within Otago Harbour.
2	Port Chalmers Fishermens Co-operative Soc. Ltd	Opposed	Oppose the dumping of material as has not considered the dump site area to commercial trawling local fishing boats and fishing grounds.
3	Alliance Group Ltd	Support	Supports proposal as additional shipping capacity is required to carry an expected increase in the volume of exports. Bigger ships have better economies of scale, and it would make the export trade md uncompetitive if big ships couldn't load at Port Chalmers.
4	City Forests Limited	Support	Supports as Port Otago is only economically viable export port for majority of City Forests Limited products.
5	Te Runanga o Otakou Incorporated	Opposed	Concerns with the dredging of material from the foreshore and seabed and proposed disposal of dredge material at disposal sites. Has cultural, spiritual, historic and traditional relationship with the Otago Harbour.
6	D J Wooffindin	Opposed	Concerned with dumping of spoil at Hayward Point, Spit beach and south Spit beach dump sites as it would have a detrimental effect on surf quality at Aramoana beach and eventually destroy the surf in that area.
7	R Hesson	Opposed	Opposes all parts of application as risk of ecological damage and environmental impact on the natural resources.
8	W Bretton	Opposed	Concerns with Port Otago model for sediment dispersal and large volume of sediment and sand on coastline.
9	W M Faasega	Opposed	Concerned with the dumping of the dredgings at Taiaroa Heads/Aramoana. The dredgings have caused sand to be washed further up the coast. Wants sand dumped a further 50kms off shore.
10	K Farhi	Opposed	Concerned with negative impacts of the extension of the wharf (noise, light spill and views) on submitter's home environment and proposal will detrimentally affect the character of Careys Bay (decreased property values and loss of income for cafés and bars).
11	K Nicolau	Opposed	Concerned with noise of dredges, the dumping of spoil, DCC District Plan breaches, lighting, meeting Kyoto Pact, fishing jetty to become a berth or further reclamation, spawning locations, and devaluation of property.

12	J C Cecchi	Opposed	Concerned with negatives effects on residents enjoyment and the nature of the Carey's Bay community, the effect the container cranes will have on the view and outlook from Carey's and surrounds.
13	J Bretherton	Opposed	Concerned with the effect on the salt marsh adjacent to entrance of the harbour which is a bird habitat and needs specific protection.
14	J P Cecchi	Opposed	Concerned with negative effects on residents enjoyment and the nature of the Careys Bay community, the effect the container cranes will have on the view and outlook from Careys and surrounds.
15	R H Dunn	Support	Supports the project as it is an important development for Port Otago Limited, exporters and for economic growth, including more jobs in the region. Bigger ships should lower the carbon footprint overall.
16	R A C Wallace	Opposed	Concerned that not enough research has been done recording the outcome of dumping and the effects on the sea life of the local coast-lines north and south.
17	P H Young	Opposed	Concerned with the impact of sediment drift on fisheries in the area, including the threat to the ecosystem in general, and paua etc along the coastline. Wants dumping to be used to reclaim areas within the harbour.
18	P J S McGregor	Opposed	As a paua quota holder he is concerned that the dumping of material will be a threat to paua beds in the adjoining coastline.
19	A D Parker	Opposed	Concerned with dumping of dredgings and the sediment covering wild and re seeded paua in quota owned by submitter in Pau5d.
20	P M Reid	Support	Otago Harbour is already a heavily modified environment through port activity and has been for over 130 years. The harbour is in excellent condition and conclude that the dredging and port expansion over the last 30 years has not been detrimental to habitats on or around the harbour. Believes that the environment will quickly recover from the project and the effects and impact will be minimal.
21	D G Kilpatrick	Opposed	Concerned that surfing quality at Aramoana will be degraded and Murderers and Karitane could also be adversely affected if dumping additional dredging material at Aramoana and Heyward Point occurs. If a wave breaks on the spoil ground then there is less wave energy in the near shore surf zone which reduces surf frequency and quality. Also concerned about water turbidity and that dumping near shore
22	J M Fisher	Opposed	Concerned with having to pay additional ORC rates to fund proposals at Port Chalmers, and the effect of noise, light and air pollution and the visual impact the extended wharf will have, together with concerns about her property being devalued. Concerned that 24/7 dredging will have a detrimental effect on health and well being of family and visiting friends.
23	O Williams	Opposed	Concerned that proposal will affect the quality of waves along Dunedin's north coast.
24	J D Nicolau	Opposed	Same submission as Dylan Nicolau.

25	R J Nicolau	Opposed	Same submission as Dylan Nicolau.
26	D Nicolau	Opposed	Concerned that the cultural impact on Maori (Ngai Tahu) and their generations far outweigh the need for the project. Dumping of dredge spoil will cause death to all that live there, smothering benthic animals and causing loss of habitat. Concerned with adverse effects on marine animals, filter feeding organisms, and fauna by suspended sediment and turbidity
27	B Nicolau	Opposed	Concerned that shipping lanes disrupt breeding and fishing grounds. Vessels take on and discharge millions of litres of ballast water transporting pollution disease and invasive species around the world. Concerned that the cultural impact on Maori (Ngai Tahu) and their generations far outweigh the need for the project. Dumping of dredge spoil will cause death to all that live there, smothering benthic animals and causing loss of habitat.
28	T A Baines	Opposed	Concerned with noise from the container handling and the release of fine silt from dredging, decant water overflow and destructive blasting of hard bottom and reef areas. Believes sand build up at Warrington Beach is a secondary result of dumping by redirecting outfall from Blueskin Bay. Wants hearing panel to visit Careys Bay at various times day and night.
29	P M K Sales	Opposed	Opposes extension to Multi-purpose Wharf but supports construction of a fisherman's wharf. Concerned with incremental erosion of residential and recreational amenity at Careys Bay.
30	P T Herbert	Opposed	Concerned with possible destruction of paua and kina in surrounding area.
31	R F De Lautour	Support	Essential that the work covered by the applications be carried out in time for the introduction of the larger ships. If not it would be near disaster for Port Chalmers, damage the economy and well-being of Dunedin and Otago and result in high added costs to take cargo to Lyttelton.
32	L C Poulsen	Opposed	Opposes the dumping of dredge spoil out at sea and the impact on fish as would have adverse effect on commercial fishing business.
33	S M Stephenson	Opposed	Concerned with the dredging of the channel and dumping of sediment as have significant detrimental environmental and commercial costs. Also objects to the noise and lighting from extending wharf at Careys Bay.
34	S L Woods	Opposed	Concerned with the dumping of sediment off Taiaroa Head as will have ecological effects. Will reduce water clarity, destroys rock reef habitats, many kelp and kills key marine species.
35	T Harris	Opposed	Concerned with the disposal of material that may adversely affect the quality of the surf wave. In particular Heywards Point Aramoana and Shelley Beach.
36	N Shaw	Opposed	Opposes applications as a concerned surfer in Otago as it will destroy the surfing access to Aramoana and also affect local surfing business.

37	P R Mahoney	Opposed	Concerned with the deepening of Otago Harbour as will affect the surf quality. Also believes a conflict of interest as Otago Regional Council shareholder of Port Otago Limited.
38	J W Foerster	Opposed	Opposed due to increased noise, loss of amenity and loss of special character and also likely to reduce property values.
39	R Mahoney	Opposed	Opposes as depositing of material outside the harbour will have a negative impact on surfing
40	J Hume	Opposed	Concerned with the increase in noise levels and light at night resulting in the degradation of the values of homes and community.
41	K L Greager	Opposed	Concerned with the negative environmental, social and cultural impact.
42	N Wilson	Opposed	Concerned with increased noise and lighting levels, also concerned with the effect on cockle beds, sea bird feeding and the effect on Aramoana beaches.
43	S Jennings	Support	Port Otago's plans for the deepening of the harbour channel and extension of the wharf will improve draft restrictions for large vessels, increasing their efficiency and service and will future proof the wharf. This means improved productivity, supply chain efficiency and reduced carbon footprint.
44	N Bould	Opposed	Concerned with the effects of dumping the spoil on the surrounding beaches and the potential destruction of the sea floor habitat. Also concerned with increased noise levels.
45	H Mc Black	Opposed	Concerned with the proposed disturbance, removal and deposition of the dredge material and its effects, including a) the effects on swell size and strength of the breaks and the blocking of swell windows, and b) the loss of economic benefits of surf in the north coast peninsula.
46	M Gunson	Opposed	Concerned with the effect on surfing at Aramoana beach.
47	R Tan	Support	Deepening the channel and extending the multipurpose wharf will mean that larger container ships will be able to be worked on the outer multi-purpose wharf, leaving the inner wharf and Beach Street wharf free for cruise ships.
48	W G Lloyd	Support	Supports all aspects of application.
49	P J Conway	Support	No comments given.
50	A R Richardson	Support	Supports positive development for Dunedin.
51	T Leckie	Opposed	Concerned that it will affect the quality of surfing waves at Aramoana.
52	N D M Gardner	Opposed	Concerned with effects on the marine life within Otago Harbour. Also concerned with pollutants, noise as a major disruption to the community and dumping of rock will destroy all life that has inhabited current reclamation.
53	P J Sutherland	Support	Supports for economic growth and upgrade to wharf for fishing.

54	M C Parry	Support	No comments given
55	M A Jenks	Opposed	Concerns with depositing of dredge from deepening channel and surfing at Aramoana, Murdering Bay and Karitane.
56	G E Skinner	Opposed	Concerned with damage to health of paua population and food source of the paua and loss of fishing through increased turbidity from suspended sediment.
57	Aramoana League (Inc)	Neutral	Concerns with silting caused by dredging as could affect ecosystem in Aramoana saltmarsh, consideration given to Long Mack Wall as dredging to deepen and maintain channel will take place alongside this groyne, concerns with existing Spit Wharf and deposited dredge material over prolonged period. Also concerns with surfing as wave formation could change.
58	B Harrison	Opposed	Concerns with surfing on the coast of Aramoana to Karitane as surfing is world-class.
59	A Heineman	Opposed	Concerned with the effect on local fisheries.
60	G S Heineman	Opposed	Concerned as the dumping of dredging will damage trawl grounds, crayfish migratory route & damage to perilous settlement.
61	R Richards	Opposed	Oppose to deepen, widen and maintain lower harbour channel, the swinging area and Port Chalmers berths to allow larger ships in to Port Chalmers and dispose of dredge spoil to sea
62	R D Hemi	Neutral	Does not oppose the dredging but has concerns with the potential effects on the northern beaches.
63	T Brough	Opposed	Concerned with the dredging and disposal of sediment particularly at AO site and the possible effects.
64	R K James	Opposed	Oppose to AO dumping site and partially oppose the dredging of the harbour.
65	M F Barker	Opposed	Concerns with the release of large amounts of fine sediments into the harbour from dredging operations
66	J Hayhurst	Support With Conditions	Not completely opposed but wants to ensure works carried out are done in an environmentally responsible manner and will protect the harbour mouth and surrounding beaches from degradation.
67	M McFarlane	Neutral	Concerned the noise created on new Multi-purpose Wharf by port operations will affect the Careys Bay Community and insufficient wheel chair access on wharf.
68	B Mullane	Opposed	Concerned with the effect on local fisheries.
69	M J T Linzey	Opposed	Concerned with the effect on marine life and increased noise levels.
70	M Trewern	Opposed	Concerned with the destructive impact on the sea bed and threat the fisheries.
71	T Taiaroa	Opposed	Concerned with effect on commercial fishing
72	G N Morris	Opposed	Concerned with destructive impact on the sea bed, threat the fisheries and marine echo systems.

73	L A Rust	Opposed	Concerns with the potential environmental impacts and impact on the world class surfing and water recreation locations.
74	D Westcot	Opposed	Concerned with the impact on Careys Bay amentiies, noise, light and visual. Also concerned with the impact on world-class surf break resource in Blueskin Bay.
75	T Pairman	Opposed	Concerns with the odour from the dredging in the harbour and the timing of when these consents will be exercised.
76	G Robinson	Opposed	Concerned with the negative impact on the sea bed and the threat to fisheries.
77	W D Brown	Neutral	Concerns with the Fish and shellfish resources within Otago Harbour, disposal of dredged material at South spit Beach, disposal of offshore AO disposal site and reconstruction of long Mac Breakwater, Groynes and Pilot Wharf
78	B Smith	Opposed	Concerned with the severe impact on the wildlife, shape of the harbour and effect on tourism in the area.
79	J M Kidston	Opposed	Concerned as to the effect on the marine environment and local community.
80	B Stuart-Menteath	Opposed	Concerned with the effects on marine habitat and endangered wildlife.
81	P H Shanks	Opposed	Concered with the effects on suffers, shell fish and protected species habitat.
82	A Woolley	Opposed	Concerned with the effect on the quality of the world class waves on the north coast.
83	F Griffin	Opposed	Concerned that the proposed dump site will have irreversible effects on the immediate environment.
84	J Ross	Opposed	Concerned with disposal sites and suspended sediment and is not reassured by the studies regarding the environmental impacts of the dredging and disposal of dredge material.
85	N J Cullen	Opposed	Concerned with disposal sites and suspended sediment and wants research on what the expected impacts will be on the coastal environment in this region.
86	K Varian	Opposed	Concerned proposals will have negative effects on submitter's home at Careys Bay and will specify these effects at the Hearing.
87	E A Whitaker	Opposed	Concerned about effects on surfing in the area.
88	T F Wallis	Opposed	Concerned with the effect on surfing in the area.
89	D S Reid	Opposed	Concerned with the increased noise levels and the lighting from cargo operations.

90	D N Humphrey	Support	Supports for the economic value to businesses in Otago/Southland, larger ships are more cost effective, stability of labour force and ongoing jobs and minimal, if any, damage to the existing environment. Deepening the harbour and extending the wharf will position Port Chalmers as a viable alternative for larger ship calls and protects its role as the South Island export hub port. Benefits far outweigh any damage or harm to the environment.
91	D C Reid	Opposed	Concerns with the disturbance to the amenity of Otago Harbour and Deborah Bay as glare from Port operational lights and noise.
92	C J Pile	Opposed	Concerned with sediment and plume that is put in Southern current as effect fishing grounds and have a negative effect on native environment.
93	Prof A F Mark	Neutral	Accepts that the proposed deepening is a necessary part of Port Otago's forward planning but is deeply concerned with proposed monitoring i.e. statements of acceptable thresholds and actions if thresholds exceeded. The most appropriate dredging equipment and methods should be employed to minimise the release of suspended sediments. There should be restrictions on dredging in the vicinity of the Aramoana Saltmarsh Ecological Area between mid September and late April.
94	A M Parsons	Opposed	Concerned with damage to the environment.
95	I Farquhar	Support	The ability to receive larger ships is necessary for the continued efficiency and viability of export companies in southern New Zealand. It is absolutely vital containers not be aggregated for shipment any further north than Port Chalmers.
96	C A Landis	Support	Supports with conditions as further consideration given to re-distribution of sediment dumping and monitoring of the effects of sediment.
97	A J Middleditch	Support	Supports the application as ports are vital to society. Otherwise would result in job losses, increased costs to importers & exporters, increased costs to society of goods, population loss & waste off existing infrastructure.
98	S De Graaf	Opposed	Concerned with the effect on the many surf breaks in the area, especially Aramoana.
99	T Atkinson	Opposed	Concerned with the negative effect on wildlife habitats, economic rational of the project
100	F Butcher	Opposed	Concerned with extensive disruption to ecosystem and sand plume that will impact negatively on coastal dunes.
101	J L Neilson	Support	If Port Otago cannot provide deeper berths then ships will go elsewhere. A good shipping service is essential to avoid high shipping costs. Submission contains examples of screening to prevent sediment drift. Submitter has undertaken a thesis researching sediments in the upper 1 metre layer of Otago Harbour and his full submission details results. Sediment dumping in the Southland Current should quickly disperse and dilute and disperse.

102	Save The Otago Peninsula Inc Soc	Opposed	Opposes the dredging, deepening and widening of the existing channel and extending and deepening the swing area around Port Chalmers Wharves.
103	Otago Chamber of Commerce	Support	Supports the applications due to the importance Port Otago has on the economic well-being of Dunedin and the hinterland of Otago and Southland.
104	Otago Southland Employers Association	Support	Crucial for Port Otago to expand its facilities at Port Chalmers so it can remain an export 'hub" for the South Island. This has a significant positive impact on supply chain efficiency for exporters from South Canterbury to Southland. If larger ships cannot come to the port, exporters will send their cargo elsewhere, adding extra costs. Concerned with current congestion at current multi-purpose wharf. Any effects to Otago harbour will be short term and no more than minor.
105	Karitane Fishermen's Association Incorp	Opposed	Concerned activities will have a destructive effect on the environment, will be a threat to fisheries and have negative impacts on local fishery and tourism economies. The activities will have negative impacts on cultural health, and lack rigorous science and modelling and consultation in northern coastal communities. The activities give no attention to real alternatives and give no economic justification.
106	South Coast Board Riders Assoc Inc	Opposed	Opposed to the dumping of the spoils at the AO site and increased dumping of spoil material at Heyward Point and Spit Beach
107	Monarch Wildlife Cruises Limited	Support With Conditions	Considers the works vital for Port Otago, Dunedin and Otago to have a profitable and viable port facility. Dredging work will improve the amenity values of the harbour. Believes ORC has a legal responsibility to carry out such work. Wants a condition requiring POL to provide access to areas within the Harbour for a 2/3 metre draft vessel within 5 years.
108	River-Estuary Care (Waikouaiti-Karitane) Incorp	Opposed	Concerned that: dumping will threaten habitats and lifecycles of flora and fauna in the Waikouaiti River Estuary; there have been inadequate modelling of effects of dumping on northern aquatic communiities; there will be detrimental effects on ecosystems, fisheries and fish nursery habitats north of the marine dump site and there is the potential to cause build up of sediments in the Waikouaiti
109	Otago Peninsula Community Board	Support	Support application but has concerns with particulate dispersal and bywash disturbance in harbour that may cause harm to ecosystems and aquatic life.
110	L R Simon and P B Simon	Opposed	Concerned with the adverse effect activities will have on marine animals, plants, paua, koura and kelp. Also concerned with potential pollution from oil spills, and with the effect of underwater noise on fish, mammals and birds in the area.
111	Dr PE Walker and JE Aimers	Opposed	Concerned with the negative affect (sic) of dredging (including disposal of dredged material) and blasting, for the purpose of deepening the harbour channel, on the ecology of the harbour and local environs including bird habitats.

112	Jackson Bay Fishing Limited	Opposed	Concerned with the dumping of dredged material on or near fishing grounds, particularly where it could potentially be washed or drift onto rocks which threatens paua habitat.
113	Trustees of the Tide-Song Family Trust	Opposed	Concerned that the activities could affect paua beds.
114	G E Burns, Harington Point Community Society	Support	The Society believes the proposal has been thoroughly investigated and researched, and Port Otago Limited has addressed the Society's concerns through the Project Consultation Group organised by POL..
115	B H Knight and S Knight	Opposed	No comments.
116	Cruise New Zealand Incorporated	Support	Important for the cruise industry that Port Chalmers is able to accommodate the growth in cruise ship activity. Proposal will avoid clashes with berthing by cruise ships and container ships, and keep tourist and industry separate between the inner wharf and outer multi-purpose wharf. Deepening and widening the channel will assist navigation al safety and bring economic benefits to Dunedin and Otago.
117	Dr S Rust and Y Yanakopulos	Opposed	Concerned that the increased discharge of dredge spoil with adversely affect the harbour and offshore ecosystems. Construction and maintenance work will damage the local environment, disturb wildlife and disrupt residents with the loss of amenities, tourism disturbance and fall in land values.
118	Hardy Street Enterprises Limited	Opposed	Same submission as Paul H Young's.
119	Joan Fishing Co Limited	Neutral	Not opposed to widening of channel. Concerned specifically with disposal site A0 as it is the submitter's trawl grounds and is a known breeding area for English sole and a feeding ground for elephant fish. Concerned with loss of income due to sedimentation and displacement of target species. Wants continuous monitoring at site and compensation if grounds can't be fished. Also concerned that the channel to Otakou wharf may become inaccessible.
120	R D Blakeley and P C Adams	Support	Submission made on behalf of Maritime Union of NZ and Rail and Maritime Transport Union. If the position is to be maintained as a premier port and key link in NZ's international supply chain, the port must be able to handle larger ships. If not there would be implications for job numbers and an economic impact on the port. Any effects of deepening the channel will be minor and short lived. B
121	Tania Fishing Co Ltd and Karitane Charters Ltd	Opposed	Concerned activities will have a destructive effect on the environment, will be a threat to fisheries and have negative impacts on local fishery and tourism economies. The activities will have negative impacts on cultural health, and lack rigorous science and modelling and consultation in northern coastal communities. The activities give no attention to real alternatives and give no economic justification and has potential negative impacts on marine food webs.

122	J R Harrison and I J Harrison	Opposed	Concerned that dumping of dredging material off Taiaroa Heads will affect paua beds or the adjoining coastline by modifying paua habitat and affecting water clarity making diving difficult.
123	Hamburg Sud New Zealand Limited	Support	Consider Port Chalmers to be a vital part of their international network. Because of the value of cargo produced and future growth projections it is important the port can handle the larger ships. There is a corollary between a port being able to handle larger ships and increased economic activity in the region.
124	Ministry of Fisheries	Neutral	Consideration of the impacts on fisheries, fisheries habitat and fisheries values. Also consideration of the best length of time within which dredging should be completed, Discharging of decant water to depth and suitable monitoring of impacts.
125	P A Murphy S D Clarkson	Opposed	Concerned that want to moor container ships at Boiler Point as noise generated by activities as impinges on lives of those in Carey Bay.
126	Otago Rock Lobster Industry Assoc. Inc.	Support	Supports but requests that consents are conditioned to ensure the dumping of fine silts in AO doesn't occur during weather conditions that drive the spoil plume into inshore areas and no fine silts deposited in existing consented dump areas.
127	Bay Chandlery Limited	Opposed	Concerns that if dredging materials has adverse effects on commercial fishing, his supply shop will be directly affected.
128	I Stephenson C Adams	Opposed	Concerns with the adverse effects on health and wellbeing, dredging and disposal operations, noise and investigation into berthing arrangements for ships.
129	G V Kerr V M Kerr	Opposed	Object to application as the dredge material sourced from channel does not address effects of dumping dredge spoil to coastal environment. The AO Site has been adequately investigated or modelled and monitoring proposal incomplete.
130	L J Smith and E L Sherwood	Opposed	Concerns with the deepening, widening and maintaining the lower harbour channel, swinging area and Port Chalmers berths for larger Ships to Port Chalmers and the disposing of dredge spoil to sea.
131	Aurora Seafood Enterprises Limited	Opposed	Concerned with the dumping of material over an area of importance to commercial trawling by local fishing boats, especially the sole and elephant fishery; and the detrimental effects to marine habitats from suspended fine materials contained in dredged materials, e.g. water turbidity and blanket effect on kelp beds.. Economic assessment fails to assess the economic impacts of the proposal of com
132	Argo Fishing Company Limited	Opposed	Concerned with destructive impacts on the seabed, that it will be a threat to the fisheries and marine environment and have a negative impact on marine food webs; and the proposal lacks rigorous science and modelling, and gives no attention to alternatives.

133	Dr K Fisher and Dr C Davidson	Opposed	Concerned with disposal sites and suspended sediment and is not reassured by the studies regarding the environmental impacts of the dredging and disposal of dredge material. The proposal risks despoiling the pristine Blueskin bay coastline. Concerned with noise from dredging and from the Port.
134	St Martin Island Community Incorporated	Opposed	Concerned that the predicted settling of silt in the vicinity of Quarantine Island/Kamau Taurua will have detrimental effects on the marine ecology of the area, and impact on the community's activities (being navigable boot mooring and berthing, water clarity, eelgrass beds, shallowing and silting adjacent to rocky habitat, diminishing productivity of algal meadows and filter feeders being affected.
135	Southern Clams Limited	Opposed	Concerns with proposed channel dredging as environmental effects will have significant adverse impacts on local marine habitats and on Southern Clams Limited research project into sustainable harvesting of littleneck clams.
136	Silver Fern Farms Limited	Support	Bigger vessels will provide significant savings to exporters and to remain globally competitive. If SFFL had to shift cargo to another port it would shorten the shelf life, and value, of refrigerated cargo. The scientific research undertaken indicates environmental effects will be no more than minor and habitats for birds, fish and shell fish will be largely unaffected. The impact on Otago Harbour.
137	M M Cowell	Opposed	Concerned that technical assessment doesn't recognise cumulative effects, the assessment of disposal alternatives and the proposals for monitoring are inadequate.
138	J L Grainger	Support	Essential that the multipurpose wharf be extended to meet the requirements of the new generation of containers ships.
139	Otago Yacht Club Incorporated	Support	Supports the applications being granted as it is essential for the Port to cater for larger ships. It is in Otago's interest both environmentally and financially.
140	Careys Bay Association Inc	Opposed	Concerned with: noise, no alternative berthing arrangements have been considered, protection of the special character of Careys Bay, visual amenity, light spill/pollution, airborne pollution, increased road and rail traffic, effects on wildlife in Careys Bay, increased transport vehicle flows, loss of property values, the dredging and disposal operations haven't assessed the potential effects and the economic impact report overstates the potential benefits.
141	New Zealand Marine Sciences Society Inc	Opposed	Concerned that the AEE doesn't acknowledge the existence of the London Protocol re dredge spoil assessment; disposal grounds are dispersive; the hydrodynamic modelling is unable to adequately account for particles and re-suspension events; there is insufficient information about contaminants in harbour sediments; little consideration has been given to effects on higher trophic level species, insufficient information re effects on Blueskin Bay and impacts and sedimentation on flora and fauna in the harbour and impacts on teaching and research by University of Otago.

142	Surfing Taranaki Inc.	Support	Firm independent monitoring provisions needed to measure the effects of the increased dumping on surf breaks
143	R Egan	Neutral	Concerned with dumping of dredge soil at Aramoana and the effect on the quality and location of the wave at Aramoana and its power and formation, including the recreational value of surfing, cultural impacts and spiritual values.
144	C Ellis	Opposed	Concerned with impact on commercial fishing trawl grounds, contaminated dredge materials, and capital versus maintenance dredging and dumping. Spoil should be placed south of Taiaroa Heads.
145	Macandrew Bay Boating Club Inc.	Support with Conditions	Supports in principle but concerned with ongoing effects of dredging and sedimentation in Macandrew Bay. Suggests measures to prevent sedimentation.
146	J Upton	Opposed	Concerned that not enough rigorous research has been done re the dispersal of spoil from the disposal sites.
147	R Reeve	Opposed	There is no strong economic ground to argue for the necessity of Port Otago expanding. POL have failed to investigate all adverse effects of the proposal.
148	Dunedin City Council	Neutral	Proposal will contribute to economic wellbeing of Dunedin and surrounding region but concerned with cross boundary effects including noise, inundation of roads and reserves on the Peninsula and impact upon inter-tidal ecosystems
149	M A Marsich	Neutral	Observation of the effects of sand and sediment deposition will need to be closely monitored. The AEE gives no certainty that marine life, especially paua, will not be affected. No detailed monitoring plan. Wants alternative dumping site to AO
150	B F Smith	Opposed	Concerned with: the stability of Rocky Point after blasting, the range of negative impacts to the harbour and Careys Bay, decrease in land values, and the history of disregard for residents and the rules they operate under.
151	A Todd	Opposed	Concerned that evidence of detrimental impacts of channel deepening needs to be scoped. Modelling from ORC testing of underground water at Aramoana needs modelled against deeper channel and more pressure due to larger volumes of water entering and leaving Otago Harbour. Wants a significant bond on POL to compensate for any loss of amenity due to harbour reconstruction work.
152	Deborah Bay Residents Assoc Inc	Opposed	Concerned with: negative effects from noise, lighting and visual pollution that haven't been investigated with peer review, erosion of rock sea walls; the safety of yachts moored at Deborah Bay and the 24 hour dredging. Concerned also that there was no consultation with Association in regard to the Noise Assessment Report.
153	East Otago Taiapure Management Committee	Opposed	Concerned that sediment will be deposited within the East Coast Taipure due to the gyre that operates in Blueskin Bay. This sediment has the potential to significantly affect values provided by marine habitats within and surrounding the Taipure.

154	B Ferguson	Opposed	Concerned with air pollution, noise, enjoyment of existing outdoor amenity values, light spill, visual pollution and negative effects on the harbour and surrounding coastal marine area.
155	R Yates, J Yates and P Yates	Opposed	Concerned with the affect the sludge will have when dumped on AO site which is currently a cockle bed; and the movement of silt further north to Moeraki, that the information from POL may not be as peer reviewed as it should be re the behaviour of the gyro; and the fine suspended sediment will block the light to the sea floor and it will get into the shells of shell fish and ruin kelp forests.
156	L Blake	Opposed	Concerned for the adverse effects on the ecosystems around and within the dredging areas, the impacts on the salt marshes, and on marine life. Also concerned with effects on the surf breaks and wave quality and surrounding wild life, and the economic benefits surfing brings to Otago.
157	Surfbreak Protection Society Inc.	Neutral	Concerned with the potential effects of the growing, and movement, of the spoil mounds at Site AO, the quality of the surfable wave; sediment plumes and accumulation; and turbidity of the water environment, including the potential of contaminants affecting the health of recreational users.
158	Otago Conservation Board	Opposed	Concerned that there is not enough information to show how potential adverse effects on marine organisms, sea birds and the Aramoana salt marsh can be avoided, remedied or mitigated to an adequate extent. Suggest consent conditions if applications granted.
159	N Parker	Neutral	Concerned that sediment disposal could alter the marine environment of Warrington (and other coast lines).
160	R Fairhurst	Opposed	Concerned with the destruction of the sea floor within the harbour environment and also at dumping site AO; effects of reefs in the harbour and on local fish/bird/plant species. Also concerned with noise pollution.0.
161	R Rust and N Durrant	Opposed	Concerned with the disposal of dredge spoil and that it should be moved to other parts of the coastline that are short of sand rather than dumped. Wants the results of outstanding investigation work on the long term sustainability of the three existing disposal sites made public.
162	L Mitchell	Opposed	Is against the dredging to the extent it has been proposed and the dumping of silt as it will have a devastating effect on the life of the harbour and surrounding coastal areas.
163	F McLachlan	Opposed	Concerned with dredging and disposal of silt and rock and that it will harm local species and the potential effects to 'whanau ora'. The potential devastation of the environment and the potential social costs supersede and revenue or social benefits the community might gain from allowing bigger ships to berth.
164	E M Vanderburg	Opposed	Concerned with effects from dredging on local coastal environments and on the wave quality for surfing

165	G Wilson	Opposed	Concerned with increase in suspended sediments in the harbour and effect on the maintenance and operation of the submitters filtration system. The sediments are likely to negatively affect the harbour fauna. The monitoring programme lacks detail.
166	E Buky	Opposed	Concerned that probability of extensive and lasting environmental harm is high and damaging the habitat and disrupting the food supply is too big a risk to take.
167	S T Jackson	Opposed	Concerned with destruction of seafloor habitat, that insufficient modelling and no baseline monitoring has been done on effects of dumping, noise levels, and that POL has not had sufficient public meetings. Wants a dumping site further out to sea and stock counts on local fish species.
168	G S Tait	Opposed	Believes the dredging may lead to ecological problems for a number of sensitive habitats in the harbour, and concerned with impacts of sediment and wants more research done to prove there will not be significant damage to creatures in the Blueskin Bay area.
169	K Williams	Opposed	Concerned that the proposed increase in dumping of dredge material will have a negative impact on the quality of surf in the region.
170	Trustees of the Yellow-Eyed Penguin Trust	Opposed	Sediment deposition on the scale proposed is likely to adversely affect the ecological communities of both the harbour and Blueskin Bay/Warrington/Karitane areas. The proposal does not recognise the importance of nature based tourism and the potential adverse effect of the proposed dredging on the base resource of the Otago Peninsula visitor industry.
171	Pauamac 5 Incorporated	Opposed	Concerned that commercial paua fishing interests are not compromised by environmental degradation or pollution which might be caused by the dumping proposal. Possible effects being damage to paua due to smothering, loss of fishing opportunities through increased turbidity and the impact on productivity of the paua food source provided by Bladder kelp.
172	Dr G B Hall and M R Hall	Opposed	Concerned with noise-related aspects of the POL applications and the noise assessment report; the impacts on the marine, terrestrial and human environments of the applications, detrimental impacts of container stacking on the visual amenity of Careys Bay residents.
173	Royal Forest & Bird Protection Society	Opposed	Concerned with effects of sediment deposition on benthic communities, bird feeding (Including penguins) marine mammals; dredging noise and light effects on Taiaroa Head, disturbance of feeding birds on salt marsh and mud flat bird feeding areas, effects on the Aramoana Ecological Area and effects of dumping on marine mammals, bird feeding and on the ecology of the Blueskin Bay- Warrington Karitane areas.
174	Careys Bay Hotel (2008) Limited	Opposed	Concerned with noise increase as effects on business could be potentially damaging and have major effects on the well being and character of the Careys bay community

175	Stallard Law Limited	Opposed	Concerned that applicant fails to properly address the effects of the activity on: the offshore ecology of the area, including benthic communities; the spread of invasive and biofouling species and the effect on offshore and coastal birds. No consultation has been carried out in respect of impacts on fishing and fisheries resources and no research has been done on: the impact of the dredging, or commercial fisheries; the effects of tides; loss of fishing to fishers nor the social and cultural community wellbeing of the fishing community. The application fails to address mitigating adverse effects and is contrary to ss5, 6 and 7 of the RMA.
176	A Sutherland	Neutral	Concerned with the effects of dredge spoil at Aramoana and the effect on the surfing wave, and also the sediment plume for the AO dump site.
177	H Saxton	Support	On behalf of Dunedin Tourism, supports proposal as it is important for the cruise industry and tourism that Port Chalmers can handle the growing number of ships calling there, and for passenger safety to be separated from the cargo operations, and also the significant economic impact of cruise ships to Dunedin.
178	B Curnow	Opposed	Concerned with the compromising of the Aramoana Ecological Area with deepening and widening of the channel and the shaving off of three metres of the Aramoana mud flats. Concerned with erosion and subsidence, monitoring of noise with regards to bird life in the area.
179	R Reeve	Opposed	Friends of the Harbour (FROTH) concerned with: lack of investigation into adverse effects, sediment movement, resuspension of sediment fines, incremental increase of Warrington beach, no alternatives to dumping sites, loss of benthic communities at site AO, rituals of species in AO, no confidence in sediment/bathymetric monitoring, lack of monitoring by ORC under s35(1) of the RMA, harbour disturbance and effects on food chain, increased turbidity, blasting of Acheron and Rocky Point depleting inner harbour rocky habitat, and future impacts of shipping bow waves and associated erosion.
180	J R Rust	Opposed	Concerned with the effects on surfing wave conditions, including wave energy, refraction and direction. Wants spoil diverted to St Kilda beach where it would be an asset against the current erosion, or using the spoil rock and rip rap to create new surf spots. Also concerned with the adverse effects on the marine environment and character of the Otago Peninsula.
181	G H Miller	Opposed	Concerned with the potential negative effects of increased dredging and disposal on the harbour and surrounding coastal marine area have not been adequately investigated. Concerned also with noise, the enjoyment of existing outdoor amenity values and light spill and visual pollution.

182	B J Thomas	Opposed	Concerned with: the stability of land at Rocky Point; the blowing up of Rocky Point, Pulling point and Acheron Head is ecologically irresponsible and destroying kelp beds will have a trickle down effect on the harbour food chain. The potential negative effects of increased dredging and disposal on the harbour and surrounding coastal marine area have not been adequately investigated. Concerned also with noise, the enjoyment of existing outdoor amenity values and light spill and visual pollution.
183	Brendan Flack	Opposed	Concerned with sediment deposits within Kati Huirapa's takiwa and its ability to denigrate the mauri of Tangaroa by making reef systems uninhabitable by all forms of kaimoana. Also concerned with putting the spoil from dredging into an oceanic system that currently causes the accretion of the Warrington sand spit by up to 1.3 m a year. The additional spoil will have a devastating effect on the submitter's ability to manage the customary fishery in this area and on his rangatiritanga on the wahi tapu.
184	C J Hilder	Opposed	Concerned with adverse effects from noise.
185	A Hall	Opposed	Concerned that the gyre will deposit silt, fines, and other particles along Blueskin Bay and further up the coast from site AO. Breeding habitats of fish and crays and bottom feeders will be affected and food chains interrupted. Commercial fishing interests and breeding grounds will be disturbed by the dumping of contaminants and associated residue. Also concerned with the proposed 3 metres being taken from the edge of the salt marsh at Aramoana.
186	Director General, Department of Conservation	Opposed	Considers the information supplied with application is insufficient to enable Department of Conservation to assess all its effects. The application fails to promote sustainable management of natural and physical resources.
187	T N Neha	Opposed	Concerned with ability to gather seafood and the effects of the proposal on the coastal marine area. Concerned with restrictions of access for recreational use and gathering seafood.
188	W Bretton	Opposed	Concerned quality of information re deposition impacts and dispersal patterns is flawed and inadequate. Increased suspension of sediment could be damaging to health and survival of many coastal water species. Already damaged and fragile estuaries will potentially become even more severely degraded due to deposition of sand and especially silts.
189	M Guerra	Opposed	Concerned with consequences for the ecosystems and benthic communities in the Harbour and at the disposal sites.
190	ISS-McKay Limited	Support	Supports all applications as per Appendix A of Submission Form
191	K E Burke	Opposed	Concerned that dumping mud on the Otago coast will kill shellfish.

192	D Karena-Holmes	Opposed	Believes the consents should be declined because the natural world is being destroyed by this kind of development and the port should be downsized, not expanded.
193	G McGrath (WWF-NZ Hector's Dolphin Community Coordinator)	Opposed	Very little consideration has been given to potential impacts on marine mammals and seabirds. The hydrodynamic modelling does not account for silt/clay particles and re-suspension events. Information provided and investigations re contaminants in harbour sediments are highly inadequate. There is insufficient information re sediment spoil dispersion on coastal marine environments in wider Blueskin Bay area. Discusses importance of Otago Harbour and environs on Hector Dolphins and other marine mammals.
194	NZ Fed of Comm Fishermen (Inc) and Port Otago Fishermans Co-op	Opposed	Applications fail to address effects of activities on offshore ecology and offshore benthic communities, and the spread of invasive bio-fouling species, and effects on offshore and coastal birds and mammals. There has been no proper consultation on impacts on fishing, especially commercial fishermen, the fishing community at large, and the fish stocks, and on tidal movements and sand build up, nor the needs of future generations. The applications fail to deal with mitigating adverse effects and are contrary to Sections 5, 6 and 7 of the RMA.
195	J West	Opposed	Only opposes applications re dredging. The scale is unprecedented and potential effects haven't been given careful consideration. Concerned with: the speed and scale of the activities, and that the proposal is hasty and very large, and for the viability of the ecosystems including the cockle beds off Otakou, and with suspended sediment.
196	L Kellas	Support	Supports the application.
197	D R Gardner	Opposed	Concerned about disposal site and preferred the site to be moved further offshore.
198	Paua Industry Council Limited and Kina Industry Council	Opposed	Concerned that fine sediments from disposal site could reach the coast to the detriment of paua and kina. Proposal does not provide for social, cultural and economic well-being and is contrary to the Act.