

# Tiwai Peninsula

## preliminary environmental report

Photo credit: New Zealand's Aluminium Smelter (NZAS)



**Murihiku**  
**Regeneration**

January 2021

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# 1 Introduction

This report provides background information about the Tiwai Peninsula, located in Murihiku (Southland), with specific focus on potential environmental impacts resulting from the operation and potential process of closure of the Tiwai Aluminium Smelter. Archaeological sites and sites of cultural importance are not discussed in this report.

New Zealand Aluminium Smelters Limited (NZAS) owns and operates New Zealand's only aluminium smelter at Tiwai Point, near Bluff. It is a joint venture company owned by Rio Tinto Alcan (79.36 per cent) and Sumitomo Chemical Company Limited of Japan (20.64 per cent). The smelter, which commenced operations in 1971, produces around 360,000 tonnes of aluminium each year. Approximately 90 per cent of the aluminium produced is exported, the largest market being Japan<sup>1</sup>.

## 2 Background – the smelter

The Aluminium Smelter at Tiwai Point has been in operation since 1971. In the 1960s, Tiwai Point was chosen as the location for an aluminium smelter. Aluminium smelting requires a large and very reliable power source to continually supply electricity to reduction cells, and Tiwai Point's proximity to the then proposed Manapouri Power Station made it an attractive location. In addition, Tiwai Point was close to the deep sea port of Bluff and a large pool of potential employees based in Invercargill.<sup>2</sup>

The flat land and access to port facilities on the Tiwai Peninsula meant that it was deemed an ideal location for industrial development and it was anticipated that downstream industry would be also be developed (Watt, 2015). In addition, the location of a large aquifer within the peninsula meant there would be a readily available source of freshwater.

It was estimated that the smelter and downstream activities would become a major source of employment, and it was expected that Invercargill's population would subsequently increase to about 100,000 by the end of the twentieth century (Watt, 2015). Invercargill's population is currently about 56,000, arguably a long way off projections (at June 2019).

According to Watt (2015) there was little controversy around the siting of Tiwai Smelter at the time of construction from an environmental perspective. At that time the area was within the jurisdiction of the Southland County Council and the relevant planning legislation was the 1953 Town and Country Planning Act. It's important to note that the aluminium smelter had been in operation for 20 years before New Zealand's Resource Management Act (RMA) was passed in 1991.

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<sup>1</sup> <https://www.nzas.co.nz/files/2011042692804-1303766884-1.pdf>

<sup>2</sup> <https://www.nzas.co.nz>



### 3 Location and setting

The Tiwai Aluminium Smelter is located at Tiwai Point on the Tiwai Peninsula. Despite the location of a large industrial site, Tiwai Point lies adjacent to the internationally recognised Awarua wetland complex. In February 2008, New Zealand's Department of Conservation was notified by the Ramsar Secretariat of its decision to approve an application to extend the Waituna Ramsar site from around 3,500 ha to around 20,000ha and to rename it the Awarua Wetland.

The Awarua Wetland Ramsar site is now the largest protected wetland complex in New Zealand. The extension includes not only Waituna but also the Awarua Plains, the New River Estuary, Toetoes Harbour and Spit and the northern edge of Tiwai Peninsula (Figure 1).



Figure 1: Map showing Awarua Wetland Ramsar site boundaries, split over four separate areas. The northern edge of the Tiwai Peninsula is included as part of the Awarua Bay/Waituna Lagoon wetland complex.

The 2000 hectares of land surrounding NZAS is part of New Zealand's Conservation Estate managed by the Department of Conservation. NZAS leases Tiwai Peninsula from the Department of Conservation (see Figure 2 and Figure 3)<sup>3</sup>. Figure 2 shows that part of the land leased falls into the Awarua Wetland Ramsar site.

<sup>3</sup> <https://www.nzas.co.nz/pages/access-permit-to-tiwai-peninsula/>





*Figure 2: Map showing boundary of leased land - the bulk of the land leased by NZAS from the Department of Conservation covers most of the Tiwai Peninsula.*



*Figure 3: Map showing boundary of leased land - land providing access to the NZAS site is also leased from the Department of Conservation.*

Land owned by the NZAS is shown in Figure 4.



*Figure 4: Boundary showing land owned by NZAS on Tiwai Point.*

### 3.1 Ramsar Convention on Wetlands

The Ramsar Convention on Wetlands is an intergovernmental treaty for the conservation and wise use of wetlands. It is named after the city of Ramsar in Iran, where the convention was signed in 1971.

Ramsar sites are recognised as being of significant value not only for the country or the countries in which they are located, but for humanity as a whole.

The inclusion of a wetland in the List embodies the government's commitment to take the steps necessary to ensure that its ecological character is maintained. The Convention includes various measures to respond to threats to the ecological character of Sites<sup>4</sup>.

New Zealand committed to designating and protecting Ramsar wetland sites in 1976. There are currently seven Ramsar sites in New Zealand, covering approximately 67,000 hectares.

### 3.2 Ramsar and cultural values

Cultural and ecological values are often inter-twined. Wetlands are some of the most productive ecosystems on earth<sup>5</sup>, therefore it follows that they are places of significant importance to indigenous cultures. This has been acknowledged by the Ramsar Convention. The following has been taken from the Ramsar website<sup>6</sup>:

“People are at the heart of wetland conservation. The Convention on Wetlands supports governments to safeguard the cultural values of wetlands, the livelihoods they provide, and the rights of indigenous peoples and local communities to participate in their management.

Wetlands are often associated with long-standing cultural practices that enable human societies to thrive, to adapt to environmental change, and to use nature in a sustainable way. According to data from the Ramsar Sites Information Service (RSIS), nearly all Ramsar Sites provide cultural ecosystem services, and over half have spiritual and inspirational values. Integrating both nature and culture in the management of wetlands can therefore play a powerful role in their conservation and wise use.

When the Convention was adopted in Iran in 1971, in its preamble the signatories affirmed their conviction ‘...that wetlands constitute a resource of great economic, cultural, scientific and recreational value, the loss of which would be irreparable.’ In this sense, although the Convention is better known for its focus on wetland biodiversity, cultural aspects have been taken into account from the very start.”

Wetland managers and other wetland practitioners involved in integrating cultural values in wetland management can join the Ramsar Culture Network, which works in close cooperation with the UNESCO World Heritage Centre.

The international mandate of Ramsar in relation to the rights and cultural values of indigenous cultures is of particular significance to the iwi of Murihiku in relation to the remediation of Tiwai Point.

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<sup>4</sup> <https://www.ramsar.org/about/wetlands-of-international-importance-ramsar-sites>

<sup>5</sup> <https://www.ramsar.org/about/the-importance-of-wetlands>

<sup>6</sup> <https://www.ramsar.org/about/wetlands-of-international-importance-ramsar-sites>

### 3.3 Obligations of parties

The Convention on Wetlands is an intergovernmental treaty that provide the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Parties to the Convention undertake:

- to designate wetlands for inclusion on the List of Wetlands of International Importance;
- to promote the significance of these wetlands and monitor and advise of any changes to their ecological character;
- to promote the wise use of all wetlands, especially through formulating and implementing national policy on wetland conservation management;
- to promote conservation of wetlands and waterfowl by establishing nature reserves on wetlands generally, to compensate for any loss of wetland resources of listed sites, encourage research, increase waterfowl populations and promote training in wetlands research, management and wardening;
- to promote international co-operation in wetlands conservation, including the sharing of resources and expertise;
- to be represented at Conferences of the Contracting Parties, to govern implementation of the Convention.

The Ramsar Convention on Wetlands requires contracting parties to submit regular reports to the Ramsar Secretariat on work that has been undertaken to implement the Convention and on the management of sites that have been listed as Wetlands of International Importance. The Department of Conservation takes a coordinating role in the preparation of these national reports<sup>7</sup>.

The Department of Conservation is New Zealand's administrative authority for the Convention and also the manager of most of our current Ramsar wetlands of international importance.

### 3.4 Ecological importance of the Awarua Wetland

The Awarua Ramsar site covers a diverse range of natural habitats including: bog; swamp; forest; shrub land; saltmarsh; mudflats; estuaries; pools/tarns/lakes; rivers; lagoons; and sand dunes. It is home to many nationally threatened and uncommon plant and animal species; including unique sub-alpine plants and insects found at sea level, 81 different types of birds and a wide range of native fish that live in the sea, estuaries and rivers.

According to NZAS, species of significance located within the proximity of the aluminium smelter are<sup>8</sup>:

- NZ iris
- *Euphorbia glauca* (by Tiwai Wharf)
- Black fronted tern (Nationally Endangered)
- Southern NZ dotterel (Threatened - Nationally Critical) – although DoC<sup>9</sup> state that the only Southern population exists on Rakiura and this may be old information on the NZAS website.
- Australasian bittern/matuku (Nationally Critical - most severely threatened, facing an immediate high risk of extinction)
- *Asaphodes frivola* – Foveaux looper moth (Nationally Critical)

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<sup>7</sup> <https://www.doc.govt.nz/about-us/international-agreements/ramsar-convention-on-wetlands/about-the-convention-on-wetlands/>

<sup>8</sup> <https://www.nzas.co.nz/pages/environmental-performance/>

<sup>9</sup> <https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/nz-dotterel-tuturiwhatu/>



The Foveaux looper moth is at high risk of extinction and has been classified as Nationally Critical by the Department of Conservation. It's main population is located in an area of coastal vegetation on Tiwai Point that is less than 25 square metres<sup>10</sup>.

### 3.4.1 Important Bird Areas

As well as being a Ramsar site, the tip of Tiwai Point has also been identified internationally as an **Important Bird Area** by BirdLife International, due to the presence of a breeding colony of Foveaux shags.



Figure 5: Foveaux Shag. Photo: Wikipedia.

Foveaux shags are only found on Rakiura (Stewart Island) and Foveaux Strait. There are less than 2500 remaining<sup>11</sup>, which makes the breeding site at Tiwai of international importance.

### 3.4.2 East Asian-Australasian Flyway (EAAFP)

The routes that migratory waterbirds traverse on an annual basis are known as 'flyways'. There are nine major flyway around the world. The East Asian - Australasian Flyway (EAAF) stretches from the Russian Far East and Alaska, southwards through East Asia and South-east Asia, to Australia and New Zealand and encompasses 22 countries (Figure 6).

The EAAF is home to over 50 million migratory waterbirds from over 250 different populations, including 32 globally threatened species and 19 Near Threatened species.

During migration, waterbirds rely on a system of highly productive wetlands to rest and feed, building up sufficient energy to fuel the next phase of their journey. International cooperation across their migratory range is therefore essential to conserve and protect migratory waterbirds and the habitats on which they depend. New Zealand signed as an EAAFP partner in 2011<sup>12</sup>.

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<sup>10</sup> [https://en.wikipedia.org/wiki/Asaphodes\\_frivola](https://en.wikipedia.org/wiki/Asaphodes_frivola)

<sup>11</sup> [https://en.wikipedia.org/wiki/Foveaux\\_shag](https://en.wikipedia.org/wiki/Foveaux_shag)

<sup>12</sup> <https://www.eaaflyway.net/home-2-2-2-4/>

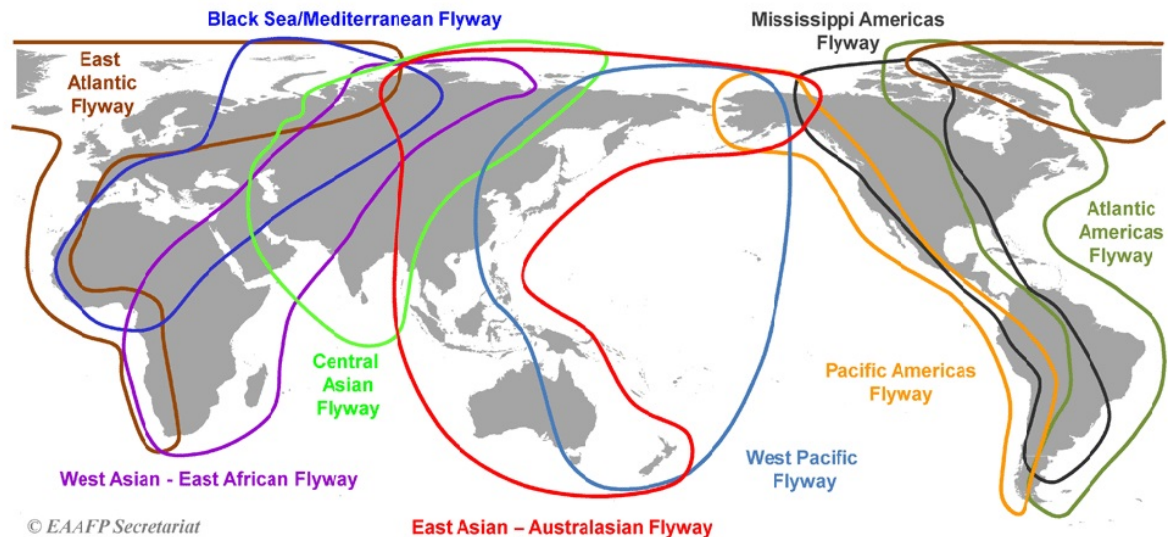


Figure 6: Map showing the nine major flyways used by migratory water birds.

Southland has three main areas where migratory birds spend the New Zealand summer (Figure 7):

- Awarua Bay
- New River Estuary
- Toetoes/Fortrose Estuary

These areas are included in the Awarua-Waituna Ramsar site, as discussed in section 3.

Awarua Bay is an arm of Bluff Harbour, 12 km in length, separated from the ocean by Tiwai Peninsula. More than 80 bird species have been sighted in the areas highlighted in Figure 7. 65 of these birds are dependent on the estuarine environment for part or all of their life.

Twenty-one species of trans-equatorial migrants have been recorded, including sanderling (*Calidris alba*; IUCN Least concern; NZTC Vagrant), common greenshank (*Tringa nebularia*; IUCN Least concern; NZTC Vagrant) and marsh sandpiper (*T. stagnatilis*; IUCN Least concern; NZTC Vagrant). 30% of grey-tailed tattler (*T. brevipes*; IUCN Near threatened; NZTC Vagrant) sightings in national summer censuses 1983-1993 were at Awarua Bay.

It is the only mainland site and has 30% of wintering Southern sub-species of New Zealand dotterel (*Charadrius obscurus obscurus*; IUCN Critically endangered; NZTC Nationally Critical). The Caspian tern (*Hydroprogne caspia*; IUCN Least concern; NZTC Nationally Vulnerable), white-fronted tern (*Sterna striata*; IUCN Least concern; NZTC At Risk), banded dotterel (*Charadrius bicinctus bicinctus*; IUCN Least concern; NZTC Nationally Vulnerable), South Island fernbird (*Bowdleria punctata punctata*; NZTC At Risk) and Australasian bittern (*Botaurus poiciloptilus*; IUCN Endangered; NZTC Nationally Critical) occur here. Game birds present include Black Swan (*Cygnus atratus*), Mallard (*Anas platyrhynchos*), Grey Duck (*A. superciliosa*), New Zealand Shoveler (*A. rhynchotis*) and Pukeko (*Porphyrio melanotus*).

Awarua Bay also hosts ruddy turnstone (*Arenaria interpres interpres*), Eastern bar-tailed godwit (*Limosa lapponica baueri*), red knot (*Calidris canutus rogersi* and *C. c. piersmai*), red-necked stint (*Calidris ruficollis*), Eastern curlew (*Numenius madagascariensis*), Pacific golden plover (*Pluvialis fulva*) and rarer visitors like Grey plover (*P. squatarola*), lesser sand plover (*Charadrius mongolus*), marsh sandpiper (*Tringa stagnatilis*) and Asiatic whimbrel (*N. phaeopus variegatus*). white heron (*Ardea modesta*) and Royal spoonbill (*Platalea regia*) regularly visit. Royal spoonbill have been recorded nesting here in 2013.

At least 18 species of fish are known from the estuaries, including five flatfish, introduced brown trout and giant kokopu (*Galaxias argenteus*), banded kokopu (*G. fasciatus*), inanga (*G. maculatus*), long finned Eel (*Anguilla dieffenbachii*), and Short finned el (*A. australis*).

Endemic moths of note include *Asaphodes frivola*, *Protithona potamias*, *Merophyas paraloxa*, undescribed *Notoreas* sp. *Stigmella ilsea*, undescribed *Harmologa* spp, undescribed *Gymnobathra* sp., *Aletia temperate*, *Graphania chryserythra*, *Thalassia helix obnubila*, and many more common species.



Figure 7: Map showing Southland EAA Flyway estuaries used by migrating water birds during the New Zealand summer.

Awarua Bay is internationally recognised as an important stop-over locations for birds migrating along the East Asian-Australasian Flyway. These birds rely on the estuary for its high quality environment and feeding grounds. This coastal area is of international importance, therefore it's vital that it's ecological health does not become compromised.

### 3.5 Role of Department of Conservation

DoC's main role with regard to the Tiwai Peninsula is pest control. An extensive network of traps targets predators of ground-nesting birds, including mustelids (stoats, ferrets and weasels), rodents, feral cats and hedgehogs.

Browsing animals such as rabbits are controlled in areas of sensitive plant ecosystems such as coastal turf fields.



## 4 Groundwater and geology

The Tiwai Aluminium Smelter obtains all the freshwater for its operations from an unconfined aquifer in the Tiwai Groundwater Management Zone (GMZ). The zone covers approximately 2,400 ha, encompassing the Tiwai Peninsula. The boundaries of this aquifer generally follow the shoreline around the margin of the peninsula.

Unconfined aquifers are highly connected to the ground surface. For example, during times of heavy rainfall, the water table (upper groundwater edge or boundary) can be at or above ground level. This is an important feature of wetlands.

The subsurface geology of the Tiwai GMZ is relatively well defined from the large number of drillholes which have been installed for the NZAS smelter (see Figure 8). From the available data the subsurface geology appears relatively consistent across much of the Tiwai Peninsula. Most bore logs show a layer of relatively clean, well sorted, quartz gravels (pea gravels) extending to a depth of approximately 5 metres below sea level. These gravels form a large shallow freshwater lens (Environment Southland<sup>13</sup>). A diagrammatic cross-section showing the geology of the Tiwai Peninsula is shown in Figure 9.



Figure 8: Map of the Tiwai Peninsula showing the location of bores drilled by NZAS. Source: Environment Southland.

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<sup>13</sup> <https://maps.es.govt.nz/apps/groundwater/zones/Tiwai.pdf>

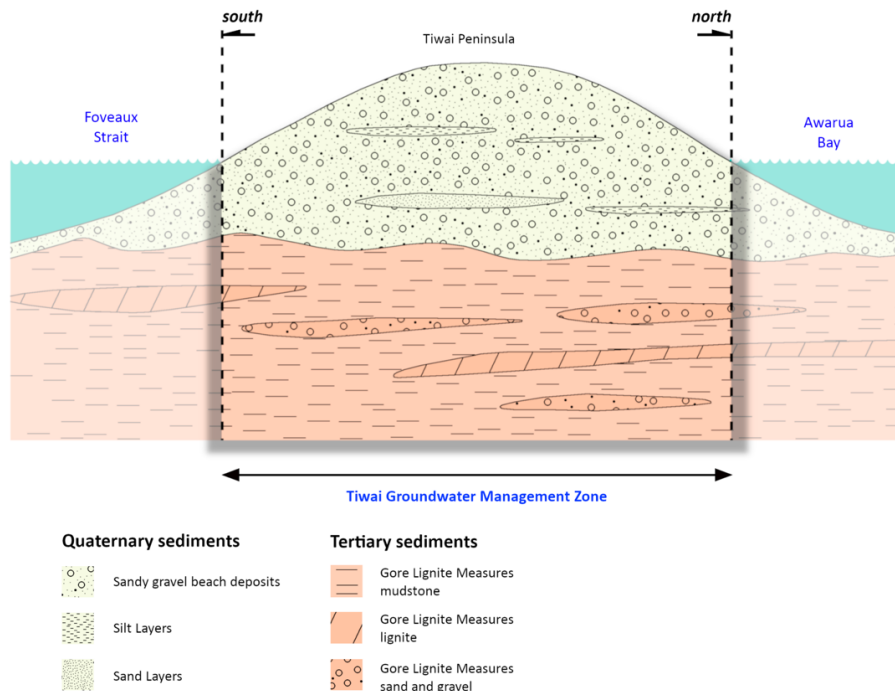


Figure 9: Cross-section of the Tiwai Peninsula showing geology. Sand and sand/gravel deposits extend to a depth of 20-25 metres. Source: Environment Southland.

Sand and sand/gravel deposits host a shallow unconfined aquifer system that effectively forms a freshwater lens underlying the peninsula (Figure 10). Depth to groundwater ranges from 2-5 metres, increasing with elevation towards the middle of the peninsula. Within the deeper mudstone, there are lenses of sand and gravel that host limited confined groundwater resources.

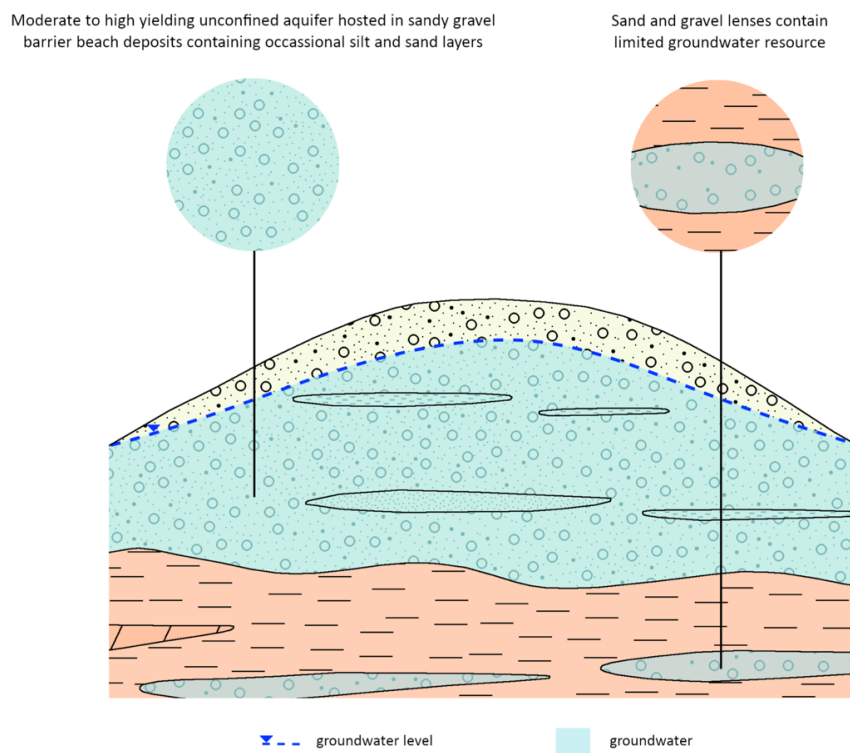


Figure 10: Cross-section of groundwater resources in the Tiwai Groundwater Management Zone. Source: Environment Southland.

## 4.1 Threats to groundwater

Groundwater found within the Tiwai Peninsula is replenished (recharged) solely from infiltrating rainfall. Therefore, times of limited rainfall or drought will result in little water coming into the system, to replace water being removed by NZAS. Groundwater naturally discharges to the surrounding coast.

If too much water is taken by NZAS there is a risk of surrounding saltwater flowing into the aquifer (called salt water intrusion). This would render the aquifer unsuitable as a source of freshwater.

The other main risk to groundwater in this zone is contamination from industrial land use. The high level of connection between the groundwater and surrounding coast also means that coastal environments could also be at risk of contamination from industrial waste.

## 4.2 Minimising risk of supply

Although the Tiwai aquifer is quite large, the fact that it is surrounded by sea water means that it is at high risk of saltwater intrusion as a result of high abstraction rates and/or the effects of sea level rise.

According to Watt (2015), NZAS has an agreement with the Invercargill City Council “to the effect that the Council will supply water to Tiwai if the integrity of the aquifer is threatened. The fiscal implications of this possibility for the Council would be significant. Water supply is therefore a very real consideration for any use of the site other than for an aluminium smelter under the current agreements” (page 6).

It may be worth investigating to see if this agreement is still in place.

# 5 Environmental risks

## 5.1 Landfill waste

Tiwai Peninsula is characterised by a combination of well-drained soils and underlying coarse gravels (see Figure 9). This means that any contamination of the land surface will travel relatively unimpeded to the underlying aquifer and coastal environments. Given the high connectivity between the groundwater and wetlands in this area, there is a potential risk of contaminated groundwater affecting wetland communities on the peninsula and surrounding coastal communities.

As discussed in section 3.4, Tiwai Peninsula and Awarua Bay are internationally recognised for their ecological importance. The New Zealand government has an obligation under the agreements it has signed with Ramsar and the EAA Flyway to protect these areas from environmental degradation. It can be argued that the long-term effects of the toxic landfill site on the peninsula could be potentially devastating to wildlife if appropriate remediation measures are not undertaken.

## 5.2 Risk of tsunami

The Tiwai Smelter sits at about 4 metres above the current high tide level. A study was commissioned from GNS to study the risk of tsunami reaching the peninsula. They found that tsunami generated off the coast of Fiordland would create waves of approximately 25 cm, not enough to be of concern. However, tsunami generated from the direction of the Puysegur Trench or Peru are of much greater concern, particularly if the waves generated arrive at high tide<sup>14</sup>.

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<sup>14</sup> <http://www.stuff.co.nz/southland-times/news/5174778/Smelter-devises-tsunami-response>



A tsunami of significant size and impact could not only compromise staff safety, but also cause contamination of the surrounding environment. Stores of industrial waste and waste deposited in landfill areas on the peninsular could be disturbed and be released into coastal and wetland areas.

### 5.3 Risk of sea level rise

Sea level rise is predicted to increase over the coming decades due to the effects of global warming. NIWA have published the following mean sea level rise scenarios for New Zealand to 2150 (Figure 11)<sup>15</sup>.

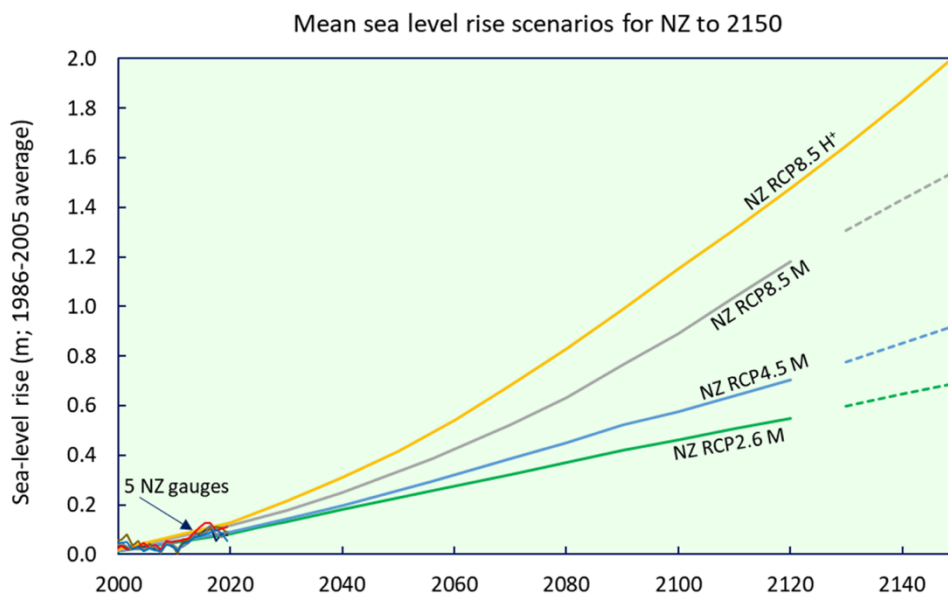


Figure: Four scenarios of New Zealand-wide sea-level rise projections recommended in the Ministry for the Environment's 2017 coastal guidance, based on the IPCC 5th Assessment Report, with the extensions to 2150 and the highest scenario, based on Kopp et al (2014). Measurements up to 2019 are from: Auckland, Moturiki, Wellington, Lyttelton, Dunedin. Sea level height is relative to the average mean sea level over the recent period 1986-2005, which IPCC use as a zero baseline for projections.

Figure 11: Mean sea level rise modelled for New Zealand to 2150 by NIWA.

The following maps (Figure 12 and Figure 13) illustrate what sea level rise could look like for Tiwai and surrounds in terms of a changing shoreline<sup>16</sup>. Note that the modelling used is a 'bathtub filling' scenario and does not take into account accelerated coastal erosion, which would likely result in further changes to future coastlines.

Road access to the Tiwai Peninsula would become increasingly challenging as sea level rises. This is particularly noticeable when sea level rises 1.0 metres above the current high tide level. At this point the Tiwai smelter is likely to be located on an island, as part of a network of newly created islands.

<sup>15</sup> <https://niwa.co.nz/natural-hazards/hazards/sea-levels-and-sea-level-rise>

<sup>16</sup> [https://coastal.climatecentral.org/map/15/168.3535/-46.4104/?theme=water\\_level&map\\_type=water\\_level\\_above\\_mhbw&basemap=hybrid&contiguous=true&elevation\\_model=best\\_available&refresh=true&water\\_level=1.0&water\\_unit=m](https://coastal.climatecentral.org/map/15/168.3535/-46.4104/?theme=water_level&map_type=water_level_above_mhbw&basemap=hybrid&contiguous=true&elevation_model=best_available&refresh=true&water_level=1.0&water_unit=m)

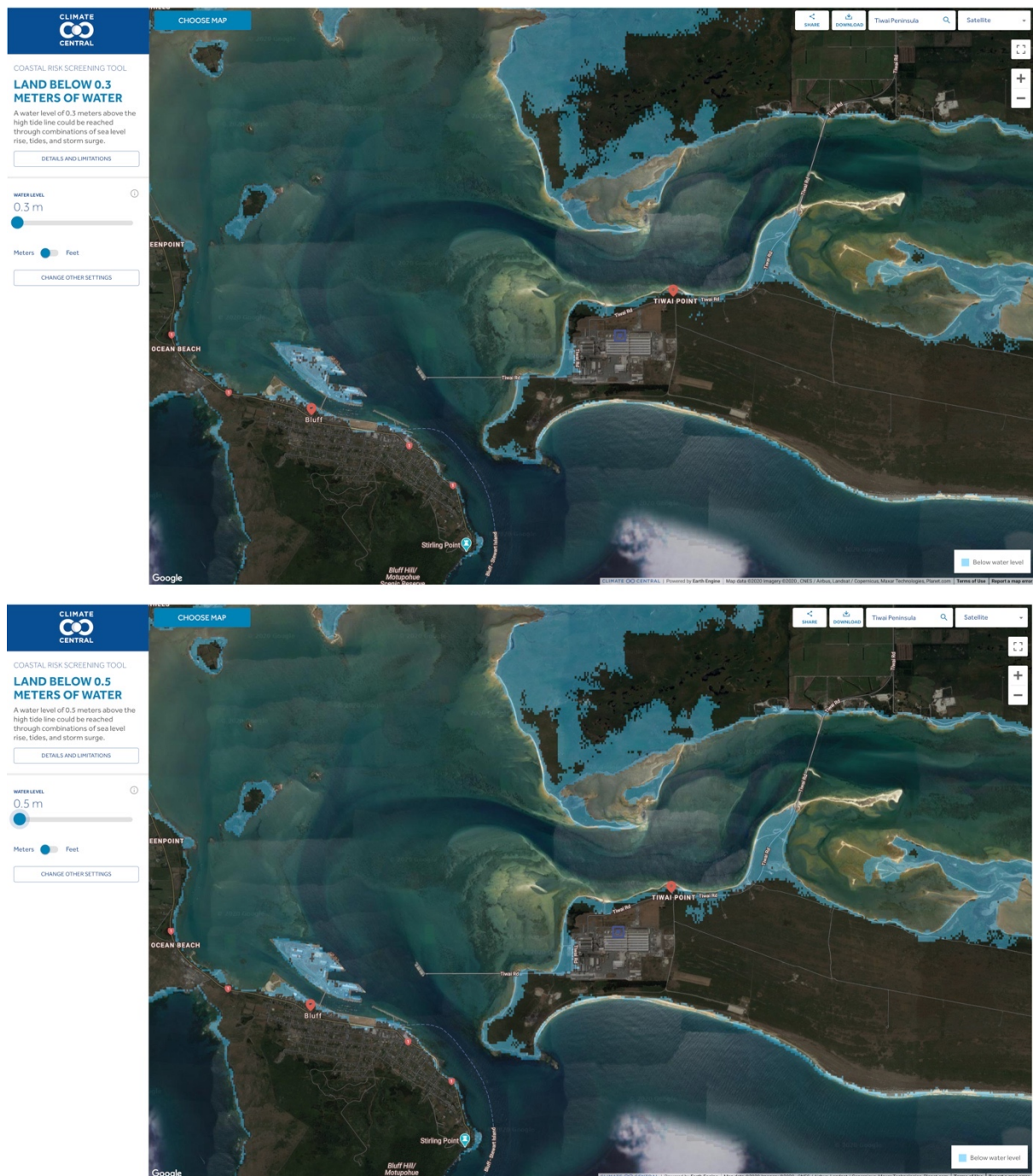


Figure 12: Changing coastline for Top: 0.3 metre sea level rise. Bottom: 0.5 metre sea level rise.







## 6 Planning for the future

It was announced on 14 January 2021 that the Tiwai Smelter will close in 2024<sup>17</sup>. This allows time to plan for comprehensive site remediation. The fact that this site is located within an internationally recognised wetland complex that hosts migratory birds, means that the implications of incomplete or inadequate remediation could be felt both locally and internationally.

The following section has been taken from the Invercargill District Plan 2019 (page 228):

### **SMELZ-P9 Re-use and Rehabilitation**

In the event that activities are discontinued within the zone, to promote adaptive re- use of buildings, and if that does not occur **encourage**\* the rehabilitation of the site, including the removal of buildings. (\* author's emphasis)

#### *Explanation:*

*The Smelter is located in the coastal environment, preservation of the natural character of which is a matter of national importance. If requirements change, adaptive re-use or replacement of existing buildings makes best use of the land resource and infrastructure. Derelict industrial properties and poorly maintained industrial land could significantly detract from the amenities of the neighbouring town.*

According to Watt, 2015 (page 15): "... the matter of eventual closure was, clearly, not considered at the time Comalco was granted planning approval to establish and operate the Smelter." Therefore, no provision was made at this time for the need for site remediation.

In 2013 Treasury published the New Zealand Aluminium Smelters (NZAS) Information Release Document<sup>18</sup>.

The aim of the report was to examine:

- the economics of the NZ Aluminium Smelter (NZAS) at Bluff, looking at both past estimated results and forecasts of future results
- the basis for Meridian's offer of a revised contract to NZAS, and
- NZAS' remediation liability for the smelter site if it decides to close the smelter.

In relation to remediation, the following was published (page 12):

42. The obligation to remediate the smelter site if it is closed is a condition of the consents granted by Environment Southland under the Resource Management Act. The most important consents relate to the landfill (expires 2023) and air discharges (expires 2031). These consents also impose ongoing monitoring obligations on the smelter. It is possible that in the event of a decision to close the smelter that NZAS could retain the consents and continue to comply with the ongoing obligations, therefore not requiring it to fully remediate the site until the landfill consent expires in 2023.

43. There is only limited public information about the scale of remediation required. A landfill management plan submitted at the time of consent renewal states that "The landfill is included in the Closure Plan for all NZAS operations. The NZAS Closure Plan is reviewed and updated at regular intervals. The current Closure Plan provisions for the landfill are to

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<sup>17</sup> <https://www.rnz.co.nz/news/national/434490/tiwai-point-aluminium-smelter-to-keep-operating-until-end-of-2024>

<sup>18</sup> <https://www.treasury.govt.nz/sites/default/files/2013-09/nzas-2522154.pdf>

cover, shape and revegetate the area". The Closure Plan referred to in this section is not a public document.

44. NZAS's financial statements include a provision for rehabilitation and closure of \$226.8 million as at 31 December 2011. This appears to be a discounted net present value of the costs of rehabilitation and closure at some point in the future (e.g. 2031).

45.

46. It is also important to note that the provision is for both rehabilitation and closure, so a significant proportion of it could relate to costs of preparing assets for sale and redundancy, as well as environmental remediation.

It is worth noting that the current resource consent relating to the onsite landfill (Figure 14) expires in 2023. Therefore there is not obligation for landfill remediation to occur until the resource consent expires.



Figure 14: Tiwai landfill site. Source: Google Earth.

It is proposed that further investigation be undertaken in terms of:

- NZAS plans for site and landfill remediation for the long-term protection of the Tiwai wetland and coastal area
- A detailed assessment of the contamination of the site and surrounds in relation to soils, geological substrates, groundwater, and coastal environment
- Modelling of risk scenarios in terms of tsunami and sea level rise

Long-term planning needs to take into account the protection of internationally recognised wetlands and coastal environments that surround the Tiwai Point Aluminium Smelter. As outlined by Ramsar, this is particularly important for the iwi of Murihiku who are the indigenous people of this area.

## Appendix A: A brief history of events ...

The story of Tiwai is complex. For nearly forty years the Tiwai smelter operated with little disruption, with the owners of the smelter seeming to 'hold all the cards' in making sure the smelter remained open and viable. However, in 2011 the future of the Tiwai Smelter was becoming increasingly uncertain, arising from increasing costs and changes to the aluminium market. Uncertainty around the future of the smelter has remained until this day.

The following was published in the Southland Express: 16 July 2020<sup>19</sup>.

**1960s:** Tiwai Point is chosen for an aluminium smelter due to its proximity to the then-proposed Manapouri Power Station, the deep sea port of Bluff and the infrastructure of Invercargill.

**1971:** The smelter commences operations.

**October 2011:** Majority owner Rio Tinto announces it is preparing to sell the Tiwai smelter in a divestment of 13 mainly aluminium-related businesses.

**October 2012:** \$70 million in capital and maintenance expenditure at the loss-making smelter is halted by Rio Tinto, further underpinning growing concerns Tiwai could face closure.

**June 2013:** Rio Tinto writes more than half a billion dollars off the value of the ageing plant, leaving it with a value on its books of just \$14.8 million, from \$606.9 million previously.

**August 2013:** The signing of an electricity deal with Meridian Energy and a one-off handout of \$30 million from the Government guarantee the future of Tiwai for at least two-and-a-half years, NZAS chairman Brian Cooper says. Pacific Aluminium, the Rio Tinto subsidiary which owns Tiwai, is withdrawn from sale.

**September 2013:** Treasury papers reveal it warned the Government not to give Rio Tinto financial help for Tiwai.

**August 2015:** Tiwai's immediate future is assured after NZAS clinches a revised electricity contract with Meridian Energy.

**May 2017:** Tiwai's underlying profit is slashed by more than 50% to \$25 million, in part due to escalating transmission costs.

**May 2018:** Underlying earnings increase by \$50 million to \$75 million for 2017, on the back of consistently higher aluminium prices, and the smelter announces it will reboot its mothballed fourth pot-line, after a six-year shutdown, having secured a more than four-year electricity deal with Meridian Energy.

**December 2018:** Prime Minister Jacinda Ardern officially opens the recommissioned fourth pot-line, meaning the plant could produce an extra 85 tonnes of metal a day.

**June 2019:** Tiwai posts underlying earnings of \$22 million for 2018, a drop of \$53 million on the previous year, saying the operating environment became significantly more challenging during the year.

**October 2019:** Rio Tinto announces a strategic review of its interest in NZAS, saying three options are being considered: achieving a more competitive power arrangement to allow the smelter to run at its current full capacity, operating as a smaller smelter through curtailment, or closure.

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<sup>19</sup> <https://www.southlandexpress.co.nz/business/tiwai-point-a-brief-history/>

**November 2019:** Regional leaders announce they will launch a “Fight for Fairness” campaign to avoid the closure of Tiwai. Invercargill Mayor Sir Tim Shadbolt, deputy mayor Toni Biddle and Southland Chamber of Commerce president Neil McAra meet to prepare a strategy to advocate for fair operating conditions.

**February 2020:** Tiwai reports a net loss of \$46 million, a \$68 million drop in earnings from the previous year. NZAS cites consistently lower and volatile aluminium prices, coupled with uncompetitive energy prices.

**July 2020:** Rio Tinto announces it will start planning for the wind-down of operations and the eventual closure of NZAS.



## References

Watt, W. J., 2015. Proposed Invercargill City District Plan Report no. 23: Smelter Zone. Invercargill City Council.