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1. CONTACT DETAILS

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Welcome to the Waitaki, formed under an ancient sea and built on the remains of prehistoric creatures from a vanished world. Shaped by volcanoes and glaciers, our district borders the mighty Waitaki River, an early super-highway for New Zealand's first people who left traces of their lives along its shores. In Victorian times a bustling town rose up, carved out of whitestone and trading with the world. Written in the stone and in the earth is the story of the Waitaki - a geological wonderland, steeped in history and waiting to be explored.

The Vanished World Centre and Geopark Trail in the rural Waitaki village of Duntroon has been in operation since 2001, introducing thousands of visitors to the unique geology, culture and history of our region. We aim to celebrate the work of this Centre and mature our geopark into a global geopark.

The Waitaki District Council, alongside Ngāi Tahu, Vanished World Incorporated, Tourism New Zealand, the University of Otago, the North Otago Museum, Tourism Waitaki, Environment Canterbury, the Waitaki Tourism Association, the Otago Museum, the Department of Conservation and the people of the Waitaki are pleased to submit our Expression of Interest to become New Zealand's first UNESCO Global Geopark.
DEDICATION

The proponents of the Waitaki Whitestone Geopark wish to acknowledge the enormous contribution that the volunteer members (present and past) of the Vanished World Society Incorporated have made to the knowledge and enjoyment of the current Vanished World geopark, and to the geoscience educational activities through which numerous school children and University students have derived benefit.

The Vanished World Trail has been enjoyed as a geopark for 17 years.

But for the efforts of these extraordinary volunteers, the dream of a UNESCO Global Geopark in the Waitaki, Te Waipounamu, Aotearoa, would not have been possible.
2.1 Straddling the 45th parallel South on the east coast of Te Waipounamu (the South Island) of Aotearoa (New Zealand), the geopark is bounded by mountains and sea, the remnants of fire and ice, and the powerful Waitaki River. The park covers just over 7,200 square kilometres. At the heart of it all are spectacular areas of karst*.

The karst landscape and its ‘whitestone’ are integral to the identity of the Waitaki region. The first people to the area found shelter in limestone caves, leaving now-treasured rock art. Waitaki’s largest town, Ōamaru, is renowned for fine limestone architecture.

Today, the Vanished World Centre celebrates the wonderous fossils that emerge from the region’s whitestone. This is why the geopark is proudly named the Waitaki Whitestone Geopark.

(See Appendix A for our logo story)

* Karst is landscape underlain by limestone which has been eroded by dissolution, producing ridges, towers, fissures, sinkholes and other characteristic landforms.
WAITAKI

Te Waipounamu (South Island)

WAITAKI WHITESTONE GEOPARK - UNESCO GLOBAL GEOPARK EXPRESSION OF INTEREST 2018

AOTEAROA
NEW ZEALAND

POPULATION
22,200

7,214KM²

16 TOWNS & VILLAGES

Oamaru

DUNEDIN

CHRISTCHURCH

45° South
2.2 The proposed Waitaki Whitestone UNESCO Global Geopark includes an abundance of unique geological and geomorphological features. Notable features include the Moeraki Boulders, karsted limestone at Elephant Rocks, as well as “badlands” and faults at Clay Cliffs.

Our important geological sites allow people to explore volcanic remnants and discover the past inhabitants of these places, from microscopic diatoms to prehistoric giant penguins and plesiosaurs.

The following descriptions highlight some of the significant features of our proposed global geopark and the attached maps provide more detail on all the special sites included. (See Appendix B)

See Supporting Material pp. 61-69 for extracts of peer reviewed published scientific research.
Moeraki Boulders and Matakaea Shag Point Boulders

Elephant Rocks

The Elephant Rocks locality has many distinctive large hummocky or elephant-shaped limestone outcrops. The “elephants” are formed from Otekaike Limestone, which originated as a fossil-rich marine sand 25 million years ago. The thick and flat-lying limestone has many joints (cracks) caused by uplift of the area. These joints, which cross each other, are readily eroded by water. Eventually, enough limestone is eroded away to leave the “elephants” exposed and isolated from each other.

Clay Cliffs

This stunning landscape of high, eroded, spectacular “badland” outcrops encourages people to wonder how this landscape was formed. The Clay Cliffs were first formed as gravels, sand and silt, in fresh waters. The sediments, which were deposited about 4 million years ago, were buried and compacted, then uplifted and eroded. The finer-grained lower strata represent lakes, while the upper section includes ancient river gravels. These river gravels probably eroded off the growing Southern Alps. The Clay Cliffs were uplifted and tilted by a recently active nearby fault.

Diatoms

Our district is world-renowned for its diatoms. Diatomite is a light powdery substance that appears unassuming to the naked eye but under the microscope is full of microfossils including diatoms. The proposed global geopark includes the famous Ōamaru diatomite sites. Ōamaru diatoms are studied all over the world and are important due to the diversity of species present.

Photo © Wayne Barrar

Moeraki Boulders and Matakaea Shag Point Boulders

The Moeraki Boulders are a popular scenic destination for a reason. These striking spherical rocks reach over 1 metre in diameter, and have formed a spectacular backdrop to photographs for over a century. Beyond the immediate visual appeal is an interesting geological story.

The boulders at Moeraki and Matakaea Shag Point formed on ancient seafloor between 55 and 70 million years ago. At the heart of each boulder is a pebble or fossil, which slowly accreted mud and lime over the millennia. Spherical boulders may have formed around something of a regular shape, like a shell, while more irregular boulders may have formed around something much more unique, like the complete 70 mybp plesiosaur skeleton found at Matakaea Shag Point!
Pillow lavas and associated volcanics

Around 34 million years ago the coast from Moeraki to Ōamaru included volcanoes erupting in shallow limestone seas. A significant trace of the region’s volcanic past are the world-class examples of pillow lavas located at Boatmans Harbour, Cape Wanbrow. Pillow lavas form when molten lava is chilled quickly in seawater. This volcanic activity also created the “gem gravels” found along the Kakanui coast, technically mineral breccias, which erupted from deep in the earth.

Whitestone

Ōamaru stone gives a unique character to many beautiful buildings but it is geologically interesting too—the stone was once alive! A combination of the passage of 20-30 million years and burial have transformed the remains of seashells into Ototara limestone. The local stone is very pure, being mainly made from microscopic sea creatures called bryozoans.

Whales, dolphins and penguins of Awamoko-Duntroon district

Our proposed global geopark has yielded ample evidence of the diverse species that once thrived here. Important bony fossils have been discovered in local marine limestones, including the giant extinct Kairuku penguins that stood 1.3 metres high; the “dawn” baleen whale Tokarahia; dolphins, such as Waipatia; as well as larger shark-toothed Squalodon dolphins.

Photo: © R Ewan Fordyce
Geosites in the Waitaki

See Appendix B for details
Geosite Importance

Legend
- Locally Important Sites
- Regionally Important Sites
- Nationally Important Sites
- Internationally Important Sites
- Internationally Important Fossil discoveries
- Geopark
- Road
- Town

33. Island Cliff
Molluscs, sea urchins, other invertebrates; rare whales and dolphins; type location for some species

The geosite map shows various locations and features, including:
- Waitangi Village
- Omarama
- Otematata
- Kurow
- Duntroon
- Waitaki River
- Waitaki Bridge
- Waitaki Bridge
- tortoise Island
- Oamaru
- Boatman's Harbour
- Kakanui North Head
- Moeraki Boulders and Scenic Reserve
- Matakea / Shag Point
- Fortification Hill
- 58 Ossier Fault zone 'The Knot'
- 63 Wai O Tura Reserve
- Waitangi molluscan fauna and holocene type
- 10 Cormack's Siding Diatomite
- 86 Jackson's Paddock
- 76 Bains Eocene diatomite
- 91 Fortification Hill
- Bayswell, karamatara, penguins
- 97 Matakea / Shag Point
- Fossil marine reptile: the *Placodus kahokochari*
Geological Timescale
Rock Types

Sedimentary Rocks

Metamorphic Rocks

Volcanic Rocks

Plutonic Rocks
Diatoms - Ōamaru’s geological claim to fame

The Waitaki is world famous for its diatoms, extracted from rich diatomite deposits that once covered ancient sea floors. Diatoms are microscopic, unicellular organisms. The little “jewels” found in diatomite are actually very small, clear silica shells, a natural glass, that each individual diatom created while alive.

Victorian era fascination with the collection, mounting and study of diatoms grew in a time of “parlour microscopy” as popular entertainment. Diatom enthusiasts’ output ranged from amazing works of scientific value, to purely artistic endeavours, with hundreds of diatoms arranged into complex geometric patterns. Ōamaru exhibition slides are highly sought after today by collectors.

One such enthusiast, Thomas Forrester (1838-1907) was the architect behind many of the ornate limestone buildings in Ōamaru and was the first curator of the North Otago Museum. He was a keen amateur scientist, with a passion for geology. In 1865 Thomas Forrester drew the first geological survey map of New Zealand.

The continuing cultural fascination with the interaction between art and science can be seen in the Forrester Gallery’s recent photographic exhibition, “Wayne Barrar; The Glass Archive”, featuring the North Otago Museum’s Victorian diatom slide collection.

Photo: © Wayne Barrar Arranged diatoms. Exhibition mount by J. D. Möller, c.1880.
2.3 The establishment of a Global Geopark will be an important opportunity to highlight, celebrate and preserve the rich and diverse history of the first settlers of our district and the continuing Māori engagement with this land and its stories.

Many years ago theWaitaki River and Valley was a seasonal hunting and fishing ground for Māori. The limestone caves and overhangs gave shelter on cold nights and made a canvas for charcoal and red ochre drawings, still preserved at the Takiroa and Maerewhenua sites near Duntroon. They provide an early record of the first travellers along the shores of the Waitaki River. The drawings depict animal, bird life and human figures and record observations of European settlers by the indigenous people.

1. Te Kaihīnaki

"Moeraki Boulders / Kaihīnaki"

Te Kaihīnaki is the Māori name for the Moeraki Boulders, situated on Koekohe Beach just north of Moeraki Peninsula. Te Kaihīnaki are the round food-baskets and water-carrying gourds of the Ārai-te-uru waka that capsized further down the coastline at Matakaea (Shag Point). The Ārai-te-uru brought kūmara from Hawaiki to Aotearoa. After visiting Te Ika-a-Māui (the North Island), the waka came down the east coast of Te Waipounamu (the South Island), where it encountered heavy seas. The baskets and gourds were lost overboard, forming the Moeraki boulders.

The Ārai-te-uru continued further down the coast before capsizing at Matakaea (Shag Point). Many of the passengers went ashore to explore the land but did not return to the waka before daylight, instead transforming into many of the well-known geographical features of Te Waipounamu.

References:


3. Waitaki
"Waitaki River"

The Waitaki is the large braided river that drains Te Manahuna (the Mackenzie Basin) and enters Te Moana-nui-a-Kiwa (the Pacific Ocean) on the east coast of Te Waipounamu. The name Waitaki, a Kāi Tahu variant of Waitangi, is a common place name throughout Polynesia. Although the specific tradition behind the name has been lost, it literally means “the waterway of tears” and is often referred to in whaikōrero (oratory) as representing the tears of Aoraki. The river was an important ara tawhito (traditional travel route), providing direct access to the rich inland mahinga kai resources of Te Manahuna and Central Otago. The use of mōkihi is strongly associated with the Waitaki, and is one of the few places where this traditional practice continues today. The river was an important source of mahinga kai, and numerous kāinga nohoanga (settlements) and kāinga mahinga kai (food-gathering places) were located on both sides of the river. The Waitaki is also well-known for the many rock art sites located in the numerous limestone outcrops and shelters spread throughout the valley.

References:


2.4 The Waitaki District is well known for its wildlife, including kororā (little blue penguins), hoiho (yellow-eyed penguins) and the Otago shag. Together the local plant, insect and animal species add to the distinct character of the proposed geopark.

Braided rivers are one of the distinctive features of Te Waipounamu (the South Island). These rivers are rare world-wide, being confined to places with high rates of tectonic uplift, fragile shattered geology and high rainfall. The wide ‘barren’ beds of shingle that flood and readily change course provide habitat for a range of unique species that have evolved to exploit this productive aquatic environment. The Waitaki lowland longjaw galaxid fish (*Galaxias cobitinis*) has adapted to the floods and dries of braided channels by wriggling down into the shingle. The current range of this threatened species is confined to the Kauru River and the Hakataramea River.

The Matakaea Shag Point Scenic Reserve features fossils of the ancestral southern conifer *Araucaria haasti* from the Cretaceous period. Present unusual biological features of the site include probably the lowest altitude and most coastal occurrence of snow tussock (*Chionochloa rigida*) grassland in Aotearoa New Zealand. The large alpine daisy (*Celmisia hookeri*) also grows at this site. The presence of these typically alpine species so close to the coast is a reflection of how the native flora can deal with fire and landslip disturbances.

The lowland limestone flora of the geopark area is notable to botanists for its diversity of endemics. For example there are several species of Gentians: one at Earthquakes (*Gentianella* with an affinity to *G. calcis*) and another at nearby Awahokomo (*Gentianella calcis* subsp. *calcis*) (there is a third at Taiko in South Canterbury, *Gentianella calcis* subsp. *taiko*). All are distinct from the widespread *Gentianella montana* of the surrounding hill country. What has happened here to cause such diversity? Botanists believe that Gentians arrived in New Zealand before the major mountain building. Did these plants evolve on the spot as the environment changed? Or did they disperse into new habitats? These small remnants of native vegetation provide tantalising clues to understanding past landforms, environments and evolution. In common with many New Zealand herbs, these Gentians have minute leaves, another puzzling characteristic of the New Zealand flora. Overseas their relatives have much larger leaves. Perhaps this is an
adaptation to avoid being eaten by the recently extinct moas?

The Lower Waitaki has its own species of native broom (*Carmichaelia hollowayi*). East of Kurow the Waitaki River moves out of the rapidly uplifting mountains onto lands where the marine limestones are not yet removed by erosion. These limestones, which moderate acidity and provide some minerals such as phosphate, combined with the relatively dry North Otago climate, produce one of the most productive soils in New Zealand. The limestone cliff crest sites where *Carmichaelia hollowayi* grows are very droughty, very hot, but free of the frosts of the flats immediately below. There is no longer enough native forest to understand how a distinct shrub could be here but perhaps the cliff crests were just too hard for large tree species. As with the Gentians, the native broom provides another piece of evidence to understand how our region has changed over time and what the pre-human flora and fauna might have been like.
The Waitaki River
geomorphology and ecology

The Waitaki River is fed by the alpine lakes of the Waitaki Basin. A braided river, shaped by a combination of glaciation and the erosion of the uplifting greywacke mountains of the southern Alps, it continues to be a massively influential force shaping the culture and geomorphology of the Waitaki District.

The Lower Waitaki River is home to New Zealand’s largest breeding colony of the nationally endangered tarapiroe or black fronted tern (Chlidonias albostriatus). These birds are colonial breeders that lay their camouflaged eggs among the river stones on islands within the braided rivers. Their evolution within this dynamic river environment has, to a limited extent, preadapted them to the threats they face from exotic pests, which struggle to access their stony islands separated by fast-flowing channels.

The Waitaki River and its tributaries are also important habitat for the nationally vulnerable ngutu pare or wrybill (Anarhynchus frontalis), the only bird in the world with a bill that is curved to the right. As with tarapiroe, ngutu pare breed exclusively on braided river beds, but as monogamous pairs rather than in colonies. The curved bill allows the ngutu pare to reach insect larvae under rounded riverbed stones. At all stages of their life the birds are highly cryptic and blend with the greywacke shingles of the riverbed by freezing when disturbed. Although difficult to spot, this behaviour makes these small birds much easier to approach than most New Zealand wading birds.
The Waitaki River flows through Lake Benmore, Lake Aviemore and Lake Waitaki, these lakes being contained by Meridian Energy’s hydroelectric dams - the Benmore Dam, Aviemore Dam and Waitaki Dam. Benmore power station is Aotearoa’s second-largest hydro station, while Lake Benmore is New Zealand’s largest man-made lake. New Zealand produced around 80% of its electricity from renewable resources in FY17, with Meridian Energy contributing just under half that amount. This is a significant achievement in sustainability compared to other electricity systems around the world, and in sharp contrast to Australia, which is still reliant on fossil fuels for about 90% of its electricity generation.
2.5 **Legal Protection**

UNESCO Global Geoparks must respect local and national laws relating to the protection of geological heritage and the defining geological heritage sites within it must be legally protected in advance of any application.

Does the site have any current legal or local designation and protection (e.g. within a World Heritage site, scientific reserve, national or regional park, urupa or rahui) that prevents or minimises damage or removal of parts of the geological heritage?

If yes, how is this enforced?

2.5 The Waitaki Whitestone Geopark (WWG) covers a geographical area of 7,214 km². The area is endowed with a rich diversity of landscapes, landforms, natural features and vegetation patterns, distinctive limestone formations, schist plateaus and hills, rugged coastal seascapes and headlands. The WWG has been shaped by geology, climate, patterns of land use and management practices carried out by generations of inhabitants.

Some of these areas are of national importance. Section 6 of the Resource Management Act 1991 (RMA) recognises and provides for areas of national importance through the preservation of the natural character of the coastal environment, wetlands, lakes and rivers, the protection of outstanding natural features, landscapes, indigenous vegetation and fauna. The RMA protects these areas from inappropriate subdivision, use and development. Section 6 also requires the maintenance and enhancement of public access to and along the coastal marine area, lakes and rivers, and recognises and provides for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.

Section 7 of the Resource Management Act 1991 requires that particular regard be given to kaitiakitanga, the maintenance and enhancement of amenity values, the quality of the environment and the intrinsic values of ecosystems. Section 7 also requires that any finite characteristics of natural and physical resources are given particular regard to in decisions relating to their management, use, development and protection. Section 7 matters generally relate to areas of district and regional importance.

Section 6 and Section 7 areas are identified and administered through National Policy Statements, Regional Policy Statements, Regional Plans and District Plans. The Canterbury and Otago Regional Policy Statements provide an overview of the resource management issues of the regions and provide a broad direction and framework for resource management within these regions. Regional Plans give effect to national and regional policy statements, and provide objectives and policies and rules governing the use of resources within the region. District Plans are prepared by territorial authorities and provide a framework for
authorities to carry out their functions in order to achieve the sustainable management purposes of the Resource Management Act 1991. District Plans are required to give effect to national and regional policy statements and must be consistent with regional plans.

The Waitaki Whitestone Geopark is protected by a range of legal mechanisms at a national, regional and district level. Appendix C provides a full schedule of the legal protection status of each of the sites being proposed for inclusion within the geopark. These areas are identified, protected and managed primarily under the provisions of the Resource Management Act 1991 by regional and district authorities. The WWG also includes sites that have been identified under the Reserves Act 1977. These areas are administered within the WWG by the Department of Conservation and the Waitaki District Council. A number of areas within the WWG are also legally protected and managed as conservation areas by the Department of Conservation. A number of sites are privately protected through covenants or agreements with the Queen Elizabeth II National Trust. Some sites also fall under protection administered by Heritage New Zealand under the Heritage New Zealand Pouhere Taonga Act 2014.

Protection of the Waitaki Whitestone Geopark sites are primarily administered by the Waitaki District Council through their functions under the Resource Management Act. The Waitaki District Plan is the primary instrument through which these functions are carried out, and provides a rule framework for the protection of individual sites and larger areas from inappropriate development and land use. Six basic categories of protection relevant to geological conservation have been established within the district;

- Outstanding Natural Landscapes (areas of national importance)
- Outstanding Natural Features (areas of national importance)
- Significant Coastal Landscapes (areas of national importance)
- Significant Natural Features (areas of regional importance)
- Geopreservation Sites (sites of district importance)
- Rural Scenic Zone (areas of district importance)

A number of sites within the geopark are identified as Heritage Items under the Waitaki District Plan. The majority of these sites are considered to be of national importance (under section 6 of the Resource Management Act 1991) and include archaeological sites and waahi tapu (sacred places of special significance to takata whenua). Heritage items are provided with protection against degradation or loss as a result of land use activities. Some of these sites are also provided with an additional layer of protection under the Heritage New Zealand Pouhere Taonga Act 2014.

The Waitaki District Plan is currently under review. This review process provides an opportunity to include objectives, policies and a rule framework focused on specific protection for identified sites within the Waitaki Whitestone Geopark, and also provides an opportunity to address any land use pressures (such as signage, car parking, visitor facilities etc) that may arise as a result of inclusion within the Waitaki Whitestone Geopark.

The WWG recognises that some sites within the geopark may be of particular importance and at present may not benefit from a sufficient level of protection through existing statutory mechanisms. In such cases, the WWG will work closely with landowners to discuss the possibility of purchasing the site, or protecting the site through the creation of a suitable covenant agreement, for example, with the Queen Elizabeth II National Trust, or through the creation of a Memorandum of Understanding between the landowner and the WWG.

Owners of identified sites within the Waitaki Whitestone Geopark are subject to relevant national legislation such as the Land Act 1948, Crown Pastoral Land Act 1998; Conservation Act 1987; Queen Elizabeth II National Trust Act 1977; Reserves Act 1977, Crown Minerals Act 1991; Walking Access Act 2008; and the Resource Management Act 1991. Sites are also protected through regional and territorial authority statutory frameworks. Alongside these statutory controls, there are other local by-laws which offer further protection for sites such as avoiding nuisance effects on reserves land, freedom camping, vegetation removal and the keeping of animals and stock.
2.6 For the past 17 years Vanished World Inc has been a strong promoter of the geological importance of our region, providing exhibitions and displays at the geopark’s Fossil and Geology Centre in Duntroon. Members have helped spread the word through talks in libraries and schools while cultivating close links with universities and research organisations.

Interpretation is primarily carried out by Professor Ewan Fordyce of the Department of Geology, University of Otago. Professor Fordyce has been Vanished World’s geology/palaeontology advisor, compiling information and images for printed materials, and interpretation labelling of exhibits within the Vanished World Centre, and trail signs. Interpretation display panels are distributed throughout the (currently) self-guided Vanished World Trail, and the wider Waitaki district. These signs explain the significance of sites and their relevance to the geology of the district. Other sites are marked with ‘Heritage Trail’ signage and ‘finger’ pointers which lead visitors along the trail. The Vanished World Trail Operational Group are responsible for sign maintenance and renewal. Each site is visited on an annual basis and a report prepared on track and signage conditions. The Track Operational Group then undertake maintenance, as required.

Printed brochures and trail maps for self-guided walks are distributed through the centre and at i-SITES around the Waitaki district. These contain detailed descriptions and information on geological features of the landscape. (See Appendix D)

Advertisements in newspapers and magazines, as well as newsletters and newspaper articles have been used to assist in communicating with supporters and the general public. The updated Waitaki Whitestone Geopark website, and social media, will be heavily utilised to further increase engagement.

The Waitaki Whitestone Geopark Trust has been established to lead a coordinated effort to identify, promote, maintain, and preserve the geologically significant sites of the district.
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<th>Site</th>
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<th>Interpretive Board/Sign</th>
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<tbody>
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<td>1</td>
<td>Waianakanua Limestone Bridge</td>
<td>Vanished World Trail Interpretive Board</td>
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<td>2</td>
<td>Bridge Point</td>
<td>Heritage Trail &amp; Vanished World Sign (Geology) ORC Tai Rua Moa Hunter Site Information Panel</td>
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<td>8</td>
<td>Hutchinsons Quarry</td>
<td>Heritage Trail &amp; Vanished World Sign (Geology)</td>
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<td>12</td>
<td>Flour Mill</td>
<td>Heritage Trail &amp; Vanished World Sign (Geology)</td>
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<td>Valley of the Whales</td>
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<td>Elephant Rocks</td>
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<td>Prydes Gully Road Quarry</td>
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<td>Takiroa shelter rock drawings</td>
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<td>Department of Conservation Interpretive Board</td>
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Information Panel locations

Waitaki Whitestone Geopark
COMMUNITY & INDIGENOUS ENGAGEMENT

UNESCO Global Geoparks should actively involve local communities and indigenous peoples as key stakeholders in the Geopark.

In partnership with local communities, a co-management plan needs to be drafted and implemented that provides for the social and economic needs of local populations, protects the landscape in which they live and conserves their cultural identity. It is recommended that all relevant local and regional actors and authorities be represented in the management of a UNESCO Global Geopark. Local and indigenous knowledge, practice and management systems should be included, alongside science, in the planning and management of the area.

Is your application being jointly developed with local whānau, hapu or iwi?

Provide details of the stakeholders/partners and their level of engagement

3.1 Our global geopark application is being jointly developed with local iwi, and should it be successful, we will embark on a wider consultation process with the aim of developing a co-management plan with key stakeholders.

Under the umbrella of the Whitestone Waitaki Geopark (WWG), several key agencies are working together. Their responsibilities and skills are co-ordinated through the WWG. One of the lead agencies for the Waitaki Whitestone Geopark is the Waitaki District Council. The Waitaki District Council and Te Rūnanga o Moeraki have worked steadily over recent years to improve their relationship. A Memorandum of Understanding was confirmed on 30 November 2016 by the Council and the Rūnanga to establish a clear understanding of this relationship, the principles it is based on and how it can guide and support decision-making of both organisations. A copy of this document can be found in Appendix E.

Mutual understanding and goodwill are essential elements of a positive working relationship between Mana Whenua and the Council. However, there are also a number of statutes which provide a framework for Mana Whenua and Council to work together.

Te Tiriti o Waitangi (The Treaty of Waitangi) is the founding document of Aotearoa / New Zealand. It provides for the exercise of kawanatanga (governance) by the Crown, while actively protecting tino rangatiratanga, the full authority, status and prestige of iwi in respect of their possessions and interests, including ngā taonga tuku iho (treasures handed down).
The Resource Management Act 1991 (RMA) contains specific obligations in relation to the Treaty of Waitangi and Māori interests. The RMA identifies, as a matter of national importance, the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga. The RMA also states that the principles of the Treaty of Waitangi must be taken into account when managing the use, development and protection of natural and physical resources.

The Waitaki District Council has recently commissioned Aukaha, a consultancy firm with a mandate to work on behalf of Manawhenua, to undertake a review of the Takata Whenua chapter of the District Plan and to identify sites of cultural significance throughout the district and the Waitaki Whitestone Geopark. These sites will be carried forward for protection as part of the District Plan review and where appropriate, may be included as part of the Waitaki Whitestone Global Geopark. Should the Whitestone Waitaki Geopark be successful with its Expression of Interest application, it is intended that a number of community meetings will be held across the geopark area. These meetings will be aimed at informing key stakeholders and the wider community of our plans and to initiate and invite feedback on practical ways that we can involve them in the planning and implementation of our proposed global geopark. It is anticipated that the Waitaki Whitestone UNESCO Global Geopark will also work with local communities, stakeholders and landowners through other mediums such as media releases, social media and Waitaki District Council consultation processes (Long Term Plan and District Plan reviews). The WWG will use existing structures to influence the geopark development, for example, through elected members, Waitaki District Council structures, iwi and community groups. A new proposal is to form a ‘supporters group’. With membership by subscription, such a group would be included in management processes. The management structures and consultation processes will continue to evolve as the Waitaki Whitestone Geopark develops.
3.2 Working Group

Do you have a working group that will assist in developing the application and in establishing your geopark proposal?

Our working Project Group is supported by an Advisory Board. The Geopark will be overseen by a Governance Body - the Waitaki Whitestone Geopark Trust.

Our team includes representatives from museums, galleries, government bodies and universities, with a strong skill set covering geological and biological sciences, conservation, economics, exhibition curation, archiving, tourism, marketing, information systems, design, district planning and mapping.

(See Appendix F for draft Trust Deed)

MARGARET MUNRO
General Manager
TOURISM WAITAKI
Also a member of the Advisory Body

MIKE GRAY
Chair
VANISHED WORLD INC.
Also a member of the Advisory Body

FERGUS POWER
Chief Executive
WAITAKI DISTRICT COUNCIL
Also a member of the Advisory Body

CHLOE SEARLE
Curator (collections and exhibitions)
NORTH OTAGO MUSEUM

KATRINA CLARK
Resource Management Planner
WAITAKI DISTRICT COUNCIL

SUZANNE BUTLER
GIS
WAITAKI DISTRICT COUNCIL

FAYE ORMANDY
Board Member
VANISHED WORLD INC.

SONIA MARTINEZ
Digital Multimedia Specialist
WAITAKI DISTRICT COUNCIL

SIEGLYN DUERO
Administrative Support
WAITAKI DISTRICT COUNCIL

NICOLAS LEBRUN
Project Management
WAITAKI DISTRICT COUNCIL

TOBIAS PETERS
Project Management
WAITAKI DISTRICT COUNCIL
GARY KIRCHER (Chair)  
Mayor  
WAITAKI DISTRICT

PROF EWAN FORDYCE  
Geology Department  
UNIVERSITY OF OTAGO

CHRIS ECCLESTON  
Zone Manager  
ENVIRONMENT CANTERBURY

PROF RICHARD WALTER  
Department of Archaeology and  
Director, South Pacific  
Archaeological Research  
UNIVERSITY OF OTAGO

SALLY JONES  
Regional Manager  
DEPARTMENT OF  
CONSERVATION

DAVID HIGGINS  
Te Rūnanga o Moeraki upoko  
NGĀI TAHU

DR KATHARINA RUCKSTUHL  
Associate Dean Māori -  
Division of Commerce  
UNIVERSITY OF OTAGO

JANE MACKNIGHT  
Director  
FORRESTER GALLERY,  
NORTH OTAGO MUSEUM  
& WAITAKI DISTRICT  
ARCHIVE

LAUREN VOSPER  
General Manager PR  
TOURISM NEW ZEALAND

JAMES GLUCKSMAN  
WAITAKI TOURISM ASSOC.

JUSTIN MCLAUCHLAN  
South Canterbury Manager  
ENVIRONMENT CANTERBURY

DR IAN GRIFFIN  
Director  
OTAGO MUSEUM

PROF EMERITUS RICHARD H SIBSON  
Department of Geology  
UNIVERSITY OF OTAGO

HELEN CLARK  
NEW ZEALAND  
PRIME MINISTER  
1999 - 2008

PATRONS  
VANISHED WORLD INC.
3.3 The Waitaki Whitestone Geopark (WWG) operates within a regulatory framework for land management.


Support for the Waitaki Whitestone Geopark has been received from many sectors of the community and from statutory agencies. The WWG will adopt a strategic joined-up approach with the community, key stakeholders and statutory agencies towards the management and protection of the geopark, and the enablement of public access to individual sites.

Under the umbrella organisation of the WWG, a collaborative approach will be undertaken to involve those with interests in the geopark. The WWG Advisory Group is, amongst others, made up of representatives from agencies with key statutory responsibilities (Waitaki District Council, Ngāi Tahu and the Department of Conservation). Other statutory agencies will also become involved as the geopark develops to ensure that the legislative status of individual sites are fully incorporated into the overall strategy for the WWG. Agency alignment will be a key objective in working towards a shared vision and unified approach. The challenge here will be reconciling the objectives of the WWG with the need for landowners and communities to maintain and develop their sources of livelihood and meeting the legislative requirements of statutory agencies. With this in mind, the WWG will work towards identifying opportunities for greater agency alignment to meet the needs and interests of the WWG, communities, stakeholders and Ngāi Tahu Rūnanga with interests in the geopark.

In meeting this purpose, the WWG will seek to:

1. Develop a clear statement about the vision for land use and management within the geopark area;
2. Undertake a stocktake of all the various legislative and regulatory functions held by Land Information New Zealand, the Department of Conservation, Environment Canterbury, Otago Regional Council, Waitaki District Council, New Zealand Walking Commission, QEII National Trust and Ngāi Tahu Rūnanga;
3. Identify opportunities for alignment of these legislative functions and how this might be achieved within existing statutory constraints;
4. Develop a shared understanding and commitment of what the Waitaki Whitestone Global Geopark is, and how each agency’s functions could contribute towards its development;
5. Develop a ‘joint management agreement’ as a primary tool for achieving the protection of individual sites within the Waitaki Whitestone Geopark. This agreement will provide a framework for discussion with landowners and statutory agencies and provide terms of agreement (such as public access, compensation, consent notices etc).
3.4 Between 2013 and 2018, elements of the proposed global geopark have received a number of awards and other types of formal recognition.

**Awards**

2017 Heritage and Environment Category winner: Vanished World Inc; Trustpower Community Awards (Waitaki).

2015 Supreme Award winner: The Duntroon and District Development Association; Trustpower Community Awards (Waitaki).

**Other formal recognition**

Ongoing – partnership between Vanished World and Department of Geology at the University of Otago. http://www.otago.ac.nz/geology/research/paleontology/vanished-world.html

Ongoing – 7 sites within our proposed geopark are recognised as being internationally significant on the New Zealand Geopreservation Inventory maintained by the Geological Society of New Zealand. (Over 50 sites from the Waitaki District are included on the inventory http://www.geomarine.org.nz/NZGI/)


2013 – Vanished World Inc. received a $15,000 grant to help refurbish the geological rock display from Meridian Energy’s Waitaki Community Fund.

2013- Department of Conservation purchase of land via the Nature Heritage Fund to create a scenic reserve at Gards Road created to conserve critically endangered plants and a rare limestone ecosystem. https://www.beehive.govt.nz/release/purchase-unique-north-otago-reserve-announced

2018 - Landmarks Whenua Tohunga is a partnership between Manatū Taonga - Ministry for Culture and Heritage, the Department of Conservation Te Papa Atawhai, and Heritage New Zealand Pouhere Taonga. Two sites in the Waitaki district were recognised as official Landmarks - sites of special significance to New Zealand that have been preserved. Totara Estate, the birthplace of New Zealand’s billion-dollar meat export industry, and Historic Ōamaru.

The Ōamaru Blue Penguin Colony has attained a Silver Qualmark Award. This Sustainable Tourism Business Award recognises a ‘Light Footprint’ - an environmentally friendly and holistically sustainable experience.
3.5 **EDUCATION**

How do you educate/plan to educate visitors to your proposed geopark? For instance, is there/will there be a museum/information centre, panel displays, interactive signage, guided walks or special programmes?

3.5 Since Vanished World Inc. was established in 2001, education has been a cornerstone of its philosophy and as it progresses along the path to UNESCO Global Geopark status, the education programmes will continue to be developed and expanded.

**Vanished World Centre, Duntroon**

The current Vanished World Geopark Centre in Duntroon houses an impressive collection of fossils detailing the geology of the district. The display has been put together under the guidance and assistance of Professor Ewan Fordyce of the Geology Department of the University of Otago with the aim of educating visitors (children and adults) about the unique geology of the district. It contains many significant and unique fossils found in the area and is a mix of original fossils and casts of fossils held at the University of Otago Geology Museum or on loan to Otago Museum. These are accompanied by interpretation panels and supporting videos showing the actual extraction of fossils from their surroundings.

A secondary display area at the Centre promotes other local stories and topics of interest to educate people about the Waitaki District. These include, Māori rock art, the moa, special geological features, gold mining etc.

The Centre in Duntroon is open daily with experienced local volunteer guides telling the story of the District’s whitestone (limestone) and its early geological history as a marine wonderland. Vanished World’s guides are in many instances intimately familiar with the sites, because they actually own the land (farms) some of the sites are on.

School visits are a regular occurrence at the Centre and teachers are given the option of a guided tour of the trail and/or time in the Centre at Duntroon. There are many opportunities for children to learn about rocks, fossils, NZ geology, crystals, rattling rocks, view diatoms through a microscope, learn about the more recent moa history, put jigsaw puzzles together, do quizzes and much more. They can even dig their own fossil and receive a Junior Palaeontologist certificate!

Vanished World is working with North Otago schools to develop a school camp programme which will also attract schools from neighbouring districts to plan their annual school camps around activities within the geopark.

Special interest groups regularly visit Vanished World. Vanished World is also able to send speakers to organisations. PowerPoint presentations and photographs bring the geological history of the Waitaki district to life. Bus tours with an experienced driver and guide are available for special interest groups.
Since its inception, Vanished World has had a ‘Friends of Vanished World’ attached to it. This is a group of people who are interested in the district’s rich geological history and who can attend lectures, go on bus trips, volunteer in the Centre and are keen on increasing their knowledge about Waitaki’s diverse geography.

Vanished World has links to the Otago Museum where many of original fossils from the Waitaki Valley are displayed as well as a close working relationship with the North Otago Museum in Ōamaru and of course the Geology Department at the University of Otago. With the possibility of a global geopark, these relationships are being strengthened further.

Refreshing the displays in the Duntroon Centre is on-going and there are plans for the University’s geology students to work in the Centre preparing fossils for display.

Geology students are regular visitors to the area to take part in field trips and excavations.

A key focus of the Vanished World Centre in Duntroon is the sale of a variety of geology books, GNS Science geological maps and posters, children’s books with a geology theme and other items which fit within the parameters of a fossil centre.

**Trail sites:**

The Vanished World Trail is supported by a very comprehensive Trail Guide and map which explains with text and photographs each of the 20 sites listed in it. The guide is available at the district i-SITES or the Vanished World Centre in Duntroon with plans to expand its availability throughout the proposed Geopark. Interpretation panels installed along the trail provide in-depth detail of the sites’ geological significance.

It is envisaged that the i-SITES within the global geopark will each have displays relating to the specific geological interest of their area, and in the future, directing visitors to a purpose built education/museum facility within the geopark.

**Printed/digital material:**

Vanished World is fortunate to have the expertise of Professor Ewan Fordyce to ensure that the information provided by Vanished World is of a high quality. His professional help to produce brochures, signage and online material ensures correct information and quality photography.

A new website has been developed and this will incorporate many features to encourage people to seek out and learn more about the sites of international and national significance within the geopark. This website is integrated with our new Waitaki Whitestone Geopark Mapping website. The mapping website promotes each individual site by making information easily accessible to the public with supporting content to encourage learning and discovery of the geological and geomorphological features in the Geopark.

Find links and instructions on how to use the mapping website in Appendix H.
Forrester Gallery, North Otago Museum and Waitaki District Archive, Ōamaru

These cultural facilities hold collections of national and international significance relating to the geology of the Waitaki district. In 2015 through 2017 and ongoing, collection significance assessment reports were completed by and in collaboration with recognised subject matter experts. These assessments were carried out in accordance with Significance 2.0 published in 2009 by the Collections Council of Australia Ltd, supported by the Australian Government and an agreed standard for Museum Practice across Australasia.

The North Otago Museum holds geology and fossil collections and related equipment and instruments and the Waitaki District Archive records and photographs which record geological and scientific research in the local community and across the geopark. Taken together these collections are and continue to be a rich resource for local and visiting historians and scientists. Most recently the NZ artist Wayne Barrar completed Wayne Barrar: The Glass Archive, an extensive research project into Ōamaru diatoms culminating in an exhibition at the Gallery, publication and public floor talk.

The Forrester Gallery collection and collecting plan recognises the important role of art in exploring place and identity and consequently contains many examples of artworks recording or responding to sites within the geopark. Most notably the North Otago Series works by internationally renowned modernist artist Colin McCahon, which specifically respond to the geology of our place.

These collections are available to support interpretive, educative and knowledge development related to the geopark. There is currently an ongoing temporary exhibition programme presented at the Gallery which draws upon these resources and an extensive and growing education programme. Recent education deliveries include Te Kaihinaki, a collaborative programme with Te Rūnaka O Moeraki which taught the cultural and scientific stories of the Moeraki Boulders.
The Waitaki Whitestone Geopark website is in English, with Te Reo Māori translations of some place names and key information. Ngāi Tahu have installed signs in English and Te Reo Māori at culturally significant sites.

Our future intention is to offer Chinese, Spanish and French translations of the website. The Tourism Waitaki website, which offers visitor information about our district and attractions, is currently being translated into French and Spanish. We have information brochures in our i-SITE visitor centres available in multiple languages.
### Visitor Monitoring

How do you currently monitor visitors to your proposed geopark?

e.g. do you currently count visitors and find out where they come from/evaluate their satisfaction levels?

#### 3.7 Visitor data has been collected from the Vanished World Centre since it opened, giving an insight to the growth and popularity of the Centre. Numbers have been climbing steadily year on year.

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The Centre’s volunteer staff manually record the number of visitors on a daily basis. As they interact with visitors they discuss feedback and act on any suggestions to improve the experience. This has resulted in Elephant Rocks being rated #1 and Vanished World Centre #2 of four things to do in Duntroon on TripAdvisor. The following are a typical sample of responses:

- **very informative**  
  After visiting the Māori rock paintings further along the Waitaki Valley at Takiroa we decided to stop in at the Duntroon Vanished World Centre. There is a small fee to enter but it is worth it. Fossils and fossil castings of prehistoric marine mammals excavated from local sandstone are on display and give an insight as to the area’s history 25 million years ago. There is even a small room where you can scrape through sandstone blocks to uncover your own fossils.

“Fascinating fossils etc
A great informative visit. Hard to believe this area was once under water and these amazing fossils have been uncovered over millenia. A real ooh aah kinda of place. Brilliant for the kids with the opportunity to ‘hunt’ for fossils themselves. And make sure you don’t miss Elephant Rocks also in the area.”

According to TripAdvisor data, the country of origin of visitors to the Vanished World Centre breaks down as follows:

- **New Zealand 46%**
- **UK 14%**
- **Australia 4.5%**
- **USA 9%**
- **China 4.5%**
- **Other 22%**

TripAdvisor also counts the Moeraki Boulders as #6 of 36 things to do in Ōamaru with 1,504 reviews listed, and the Clay Cliffs rank as #2 of nine things to do in Ōmārama with 204 reviews. Both these sites currently have no formal monitoring systems in place, but for the purposes of this expression of interest we have carried out a sample survey at Clay Cliffs, Moeraki Boulders and Elephant Rocks. (See survey data Appendix I).

The other source of data provided has been via the prominent websites of Tourism Waitaki and Backpacker New Zealand. By analysing the ‘click-throughs’ from these sites to the geosites provides us with the insight into the number of active and interest driven visitors to the attractions. These click-throughs may not immediately result in visitor attendance but rather it can be an indicator of a future planned visit to the sites.
FORWARD PLANNING

Provide details on how the visitor monitoring you undertake influences your forward planning.

3.8 We recognise the importance of reliable and consistent visitor monitoring and visitor feedback, and plan to use these continuously to help us achieve sustainable growth and effective management systems for the geopark.

The information gathered from the sites to date has provided us with a level of ‘base’ information which can now be built upon. We will actively increase the recording of visitor data from the significant sites in the geopark, which, along with digital tracking, will help show trends and interest levels across the district. As the geopark website becomes increasingly comprehensive and active this will add another, more direct, opportunity for us to track traffic seeking information on our geopark.

Methods for visitor monitoring will be in the form of remote site counters, tablets, regular customer surveys, site visits and manual recording (as is currently carried out at Vanished World).

We will regularly analyse the data, producing statistical reports to be submitted to the Advisory Board and Governance Body. These data will allow for informed decisions around management plans and other matters including ticketing opportunities, infrastructure concerns and other considerations. This will be a broad approach considering traffic and visitor volumes and impacts on our rural roads, State Highways and environmentally sensitive areas.

Click through data from Tourism Waitaki, the official Regional Tourism Website to:

Vanished World website – 552
Clay Cliffs – 2,598
Elephant Rocks – 1,497
Moeraki Boulders – 318

Data sourced from March 2017 to date.

www.BackpackerGuide.NZ is New Zealand’s largest travel guide, attracting over 400,000 unique readers per month. The web page titled ‘7 Bizarre Sights in the Waitaki Valley’ has been posted for 24 months and has received almost 13,000 reads (people that spent over 30 seconds on the page). So far, 44% of these visitors were from overseas and 56% were visitors from New Zealand (the latter includes international travellers currently in New Zealand). This page is currently receiving over 500 reads per month.
Regional, Cultural and Business Connections

How does/will your proposed geopark promote regional food, beverages, cultural and craft products, and maintain a strong connection with local businesses and iwi through joint projects? (provide at least one example for each where applicable)

3.9 As our proposed Geopark encompasses the whole of the Waitaki District, which has both established and emerging tourism businesses, we are already active in welcoming visitors from New Zealand and around the world and are familiar with the variety and range of what our region has to offer.

Tourism Waitaki, supported by several i-SITES within the district, provides information, through a range of media, about the opportunities visitors and local people have to taste our regional foods and beverages, purchase art and unique products made by traditional craftspersons and how to take part in the many festivals held in the district.

The limestone that underpins our district—and that forms the core of our geopark—has long had a strong impact on the “taste of the Waitaki”. Throughout the Waitaki district, restaurants have emerged that embrace the “paddock to plate” philosophy, preparing meals using produce grown on-site, from our waterways, and raised on our farms, offering a true Waitaki taste experience. New Zealand Christmas would not be complete without Ōamaru’s famed Jersey Benne potatoes, nurtured in the volcanic soils that render our produce among the tastiest in the country. Restaurants like Fleurs Place at Moeraki, Riverstone Kitchen on the Waitaki Plains and Ōamaru’s Pen-y-bryn have staked their reputations on the high quality of our local produce, and have earned national and international acclaim.

The wineries of the Waitaki Valley have developed their reputation on the basis of our limestone-rich soils, which have bestowed on their wines a character considered unique in New Zealand. This has led to the region being promoted as “the Burgundy of the South”. Several of these wineries have already established popular tasting rooms on or near their vineyards, and the geopark would surely spur them both to expand their hours and enhance their offerings, and also lead other wineries to follow suit.

When the first European settlers arrived in the Waitaki district, there were literally no trees to build shelter and houses from. Instead they turned to a material that was available in abundance - limestone. One hundred and fifty years on, these buildings still stand and nowhere is that more evident than in Ōamaru’s Victorian Precinct of Harbour and Tyne Streets.
Twenty five years ago the Ōamaru Whitestone Civic Trust began the long process of restoring these grain stores and offices built in the 1800s and they have been repurposed into workshops and retail spaces, while retaining some large spaces for wool storage, a whisky bond store, a large event space as well as ‘Whitestone City’, where activities, displays, and costumed guides provide a glimpse of what the town would have been like in Victorian times. Today the Victorian Precinct is a thriving community of artisans and craftspeople making and selling quality arts and crafts, and on Sunday mornings there is the added attraction of the Ōamaru Farmers’ Market, where produce raised in the rich soils of the Waitaki district attract a steady clientele of locals and visitors.

Talented and skilled people can be found throughout the Waitaki District. Cottage industries thrive with craftspeople, artists and writers living and working in and around all the small towns of the district. It is our intention to work closely with local iwi on joint projects related to the geopark as appropriate. Connections among the geopark, businesses and iwi will be further enhanced by linking businesses in the Waitaki district with an Official Geopark Partner Programme. It will be a mutually beneficial relationship whereby we help and promote each other; partners’ activities will be complementary to the geopark and vice versa. The geopark will connect with businesses offering a high-quality product to drive the economic benefits throughout the district with the flow-on advantages of increasing employment and other opportunities in the district’s smaller townships.

The Alps 2 Ocean (A2O) cycle trail’s Official Partner Programme is an example of this collaboration which is working very successfully in the Waitaki district. The A2O Cycle Trail starts at Aoraki/ Mount Cook, follows the Waitaki lakes of Benmore, Aviemore and Waitaki and travels on through the district’s limestone landscape to Ōamaru. This existing official partner model for the A2O cycle trail, which travels through the proposed global geopark, could be further expanded and developed to include other local businesses in the proposed Waitaki Whitestone UNESCO Global Geopark.

On the following pages are some examples of the local businesses, organisations and community groups, large and small, which our geopark will work with and promote.
WHITESTONE CHEESE
Artisan Food Producer

Whitestone Cheese was founded in 1987. Whitestone Cheese’s are named after places in North Otago, to reflect the regional nature of their products; including Moeraki Bay Blue and Lindis Pass Brie (named after the mountain pass that marks the starting point of the Waitaki River catchment). The milk used in making Whitestone cheese is sourced locally from cows, sheep and goats that graze on Waitaki grasslands.

www.whitestonecheese.com

FLEURS PLACE
Restaurant

Fleurs Place is a world-renowned restaurant on the waterfront at the old jetty in Moeraki Village. Its international fame rests on their serving fresh fish straight from the local fishing boats, and other delicacies from the southern waters, such as Titi (Muttonbird). Established on an early whaling station site, it is built from gathered collectables and demolition materials from all over New Zealand. Most of the vegetables served come from small organic and heritage growers around the district.

www.fleursplace.com

ALPS 2 OCEAN CYCLE TRAIL
Tourism

The Alps 2 Ocean Cycle Trail is a world-famous cycle trail that travels through some of the main landscapes of the proposed global geopark. The trail travels from New Zealand’s highest mountain, Aoraki, past great lakes and rivers, and down to the Pacific Ocean. Part of the trail includes the unique rock formations of Elephant Rocks. A short distance from here is the Anatini Fossil site, with whale bones exposed in the local limestone formation.

www.alps2ocean.com
RIVERSTONE KITCHEN
Restaurant
A world-famous restaurant in rural Ōamaru with an extensive, rambling kitchen garden and orchards, and a commitment to sourcing as much local produce as possible. Changing regularly, the Riverstone menu, created by internationally renowned chef Bevan Smith, reflects the seasons of the Waitaki and utilises the finest ingredients at their peak.
www.riverstonekitchen.co.nz

WHITESTONE CITY
Heritage Experience
Set in an original grain store that was built in 1882, and located within New Zealand’s most complete streetscape of Victorian era commercial buildings, Whitestone City is a central heritage hub. Fitted out in the style of a colonial town, where activities, displays, merchants, and an array of people in costume provide a glimpse of what the street would have been like in the town’s early days. Live displays, video imaging and interaction immerse visitors in a living, breathing past.
www.whitestonecity.com

ŌAMARU STONE SYMPOSIUM
Event
The Ōamaru Stone Symposium is a bi-annual event providing a forum for sculptors to discuss issues and share carving experiences while also demonstrating the incredible versatility and beauty of the whitestone that forms the soul of the Waitaki district. It has been run in conjunction with the Waitaki Arts Festival or the Victorian Heritage Festival since 1995, bringing sculptors, from beginner groups to master craftspeople to Ōamaru to ‘camp out’ for five days to carve Ōamaru whitestone into a wide variety of sculptures, holding public demonstrations and stonecarving workshops for children and adults.
VERTICAL VENTURES
Adventure Tourism
Vertical Ventures offers great experiences for rock climbing enthusiasts. There are atmospheric cliffs and white sands at coastal climbing venues a short journey away. Bouldering is offered at Elephant Rocks - an amazing setting with the backdrop of the Mt Domett in the St Marys Mountain Range. Vertical Ventures caters for beginners, providing professional instructors, and can also assist in sorting transportation and equipment hire for experienced rock climbers.
www.verticalventures.co.nz

PALMERSTON ASPARAGUS
Grower
Palmerston Asparagus grows beautiful fresh asparagus in silt loam soils on the banks of the Shag River in coastal Otago. The quartz present in the soil helps hold the heat that allows the spears to thrive in what is the southernmost commercial asparagus farm in the country. Rod and Nicola Philip sell their produce straight from the farm gate along State Highway One, from stalls at the Ōamaru and Otago Farmers Markets and also supply restaurants around the Waitaki and beyond.
www.facebook.com/palmerstonasparagus/

IAN ANDERSEN
Limestone Sculptor
Ian Andersen is an internationally recognised limestone sculptor who carves blocks of Ōamaru whitestone into intricate artworks.
Many of his sculptures have ended up in homes all over the world. He works from his gallery and open workshop in Harbour and Tyne streets in the Historic Victorian Precinct of Ōamaru.
All the work in the gallery is designed and hand crafted using traditional tools and methods.
www.ianandersensculptor.co.nz
FORRESTER GALLERY, NORTH OTAGO MUSEUM & WAITAKI DISTRICT ARCHIVE

These cultural facilities are housed in spectacular limestone heritage buildings listed with Heritage NZ. The Museum collections reflect the history of the district from the earliest times through fossil and geology collections, vertebrate collections, artefacts from the first settlers to Aotearoa and later waves of settlement. The Archive holds settlement records, extensive oral histories, records of scientific research, and historical photographic collections. The Gallery holds a collection relating to place and identity that records and explores connections to natural sites within the geopark.

www.culturewaitaki.org.nz

WAITAKI VALLEY WINEGROWERS ASSOCIATION

Winemaking & Winery Tours

The unique terroir of the Waitaki Valley combines the coastal breezes of the South Pacific with the dry rain shadow cast by the Southern Alps. Typically the region enjoys hot, dry summers, cold winters and long dry autumns. These climatic characteristics overlay the complex geology of the Waitakian Limestones to produce distinctive wines highly reflective of their origin.

www.waitakiwine.co.nz

ŌAMARU FARMERS’ MARKET

Community Market

Ōamaru Farmers’ Market is open every Sunday in the historic Victorian Precinct. Here visitors can meet the growers, farmers and producers of the best seasonal produce our region has to offer. The market supports small-scale and organic farming. Stalls include Raw Earth Jersey Benne potatoes from Totara, tomatoes grown in the volcanic soil of the Kakanui, Palmerston asparagus from Shag River, and famous Ōamaru Brussels Sprouts. The market is run by a Trust and offers space for local community groups and charities to fundraise.

www.oamarufarmersmarket.co.nz
ŌAMARU’S VICTORIAN PRECINCT
Heritage Precinct
A grand Victorian streetscape carved in distinctive local stone and built on the bounty of wool and grain. Under the management of the Whitestone Civic Trust, the heritage limestone buildings of the 1800s have been restored by local stonemasons and master craftspeople. The buildings are now filled with small businesses including the NZ Whisky Company, the Victorian Wardrobe (preserving clothing styles from the 1800s), glass artists, textile makers, painters and potters.
www.victorianoamaru.co.nz

ŌAMARU BLUE PENGUIN COLONY
Tourist Attraction and Wildlife Reserve
The Ōamaru Blue Penguin Colony belongs to the people of Ōamaru. The facility is owned by the Local Government Authority, the Waitaki District Council, and managed by Tourism Waitaki. The colony began when a small number of blue penguins began nesting in a former rock quarry area at the edge of Ōamaru Harbour in the early 1990s. Today, it is Ōamaru’s largest tourist attraction, with over 75,000 visitors per year, coming from all over the world. At peak season, there are over 130 breeding pairs in the colony and an additional 130 breeding pairs in a special wildlife reserve nearby.
www.penguins.co.nz

NICOL’S BLACKSMITH SHOP
Traditional Craft
Nicol’s Blacksmith Shop can be found in the small inland rural town of Duntroon, which is located in the centre of “Whitestone Country”, along the Waitaki River. Basic ironworking courses for beginners are offered throughout the year.

The skills of early blacksmiths were widely used in farming and transport in the development of this district. This historic building is classified Category I by Heritage New Zealand and is managed by a Charitable Trust and staffed by volunteers, including over 10 volunteer blacksmiths.
McLEAN & CO.

Traditional Craft

Rod and Sue McLean create ethically produced hand woven and stitched textile products using heritage looms. McLean & Co. specialise in weaving short runs of up to 200 metres of traditionally inspired, limited edition tartan and tweed fabric using locally sourced NZ wool and alpaca fibre. They have lovingly restored a c1918 Hattersley Domestic Weaving System and are committed to contribute artistically, socially and economically to their local and regional community.

www.mcleanandco.nz

NETWORK WAITAKI VICTORIAN FETE

Event

This yearly event takes place at the culmination of Victorian Heritage Celebrations - a week-long annual festival celebrating the European heritage of Ōamaru. Visitors and locals can take a step back in time and experience the look and feel of the Victorian era in the heart of Ōamaru’s Historic Precinct. Attractions include limestone sawing competitions, penny farthing races and over 100 stalls, including artisan foods and traditional crafts.

www.victorianoamaru.co.nz/fete

PEN-Y-BRYN LODGE

Accommodation

Pen-y-bryn Lodge was built as a private residence in 1889 by the famed architectural firm of Forrester & Lemon for local businessman John Bulleid and his wife. Pen-y-bryn is Welsh for “Top of the Hill” and indeed the house sits atop South Hill in Ōamaru. Reputed to be the largest single-storey timber dwelling in Australasia, the house has kept true to its Victorian heritage and today offers guests the perfect combination of old world elegance and modern amenities.

www.penybryn.co.nz
3.10 As potentially the first Global Geopark in New Zealand we are excited at the prospect of actively participating in the UNESCO Global Geoparks Network.

We have factored in membership and conference attendance fares and fees into our forward planning and budgets. We look forward to extending a warm welcome to visiting UNESCO delegates and introducing them to all that our amazing geopark has to offer.

Coordinates, boundaries or a map showing your proposed geopark’s location pp.8 -10
Supporting Materials: p.60

Three examples of national and international peer reviewed and published scientific research about your proposed geopark
Supporting Materials: p.61

Three transcripts of oral statements about the mātauranga (indigenous knowledge) that is available to recognise the special qualities of your site. pp.22 - 23
Supporting Materials: p.70
OUR STORY BEGINS...

...with Gondwana, a southern supercontinent that broke apart into new lands near the end of the age of dinosaurs. One of these fragments was Zealandia - ‘the 8th continent’ and the foundation of modern Aotearoa New Zealand.

ON A VANISHED WORLD

Zealandia drifted from Gondwana into the Pacific, carrying with it some ancient lineages of flora and fauna that have survived to the present. Plesiosaurs patrolled the shores. Dinosaurs - originally here - have gone, but kauri and beech forests, and wrens and tuataras, are amongst the survivors on modern Aotearoa.

As Zealandia drifted, it was stretched and thinned by geological forces, so that it cooled and submerged. Wide shallow seas surrounded low islands. Volcanoes erupted at weaknesses in the earth’s crust, with activity ongoing today. Rich marine faunas were fossilised in limestone.

IN THE VALLEY OF THE WHALES

Let’s look at the time of islands and shallow seas, some 25-30 million years ago. The Waitaki Valley was under a sea, full of life. Shark-toothed Dolphins swam in large shallow bays supplied by nutrient-rich waters. Marine life included plants and animals, large and small, soft or with skeletons. Their remains broke down after death to form white limey sand on the seafloor. As the sand was buried over time, it hardened, gradually forming limestone - the “Whitestone” of our region.
Diverse birds thrived on the mountains and plains, and in the grasslands and forests of Zealandia, just before humans arrived. Flightless birds include the kiwi, moa and adzebill. Flying birds ranged from tiny wrens to the mountain dwelling parrot, the kea, and the Haast’s Eagle. Our pre-human shores were a penguin paradise, home to the Kairuku penguin, as tall as a man.

By 5 million years ago, an active plate boundary developed, late in the history of Zealandia. The stunning Southern Alps rose, growing as fast as fingernails. In the last 2 million years, southern glaciers carved the majestic wilderness of Fiordland.

More recently, this limestone with its history of fossils, was rapidly forced to the surface by the movement of the Pacific and Australian tectonic plates. Uplift and erosion have formed outcrops of rock in which we can see the fossil evidence of the past.

The arrival of humans to our region over 500 years ago was to change the landscape forever. Our earliest settlers arrived on a landscape where enormous Haast’s eagles preyed upon moa, towering flightless birds. The Waitaki river mouth was the location of one of the largest ancient Māori settlements in New Zealand with evidence of extensive moa hunting and moa ovens.
Diatomite is one of Waitaki’s prehistoric jewels. Formed 35 million years ago when the area was under the sea, these deposits contain microscopic fossilised organisms. In the late 1800s, Victorian era scientists and enthusiasts would extract the world famous Ōamaru diatoms and arrange them into exquisite displays on glass slides - minature artworks that could only be seen under a microscope.

The mighty Waitaki River provided a natural route for local Māori as they travelled back and forth between the East and West coasts of the Te Waipounamu (South Island) leaving a Rock Art legacy on the limestone.

The next wave of settlers from across the globe found fertile alluvial flatlands and pockets of rich volcanic soil, a land naturally suited to agriculture because vast areas were treeless and little clearing was required. Wheat initially brought prosperity to the region and the world’s first frozen meat industry followed.
A CITY OF WHITESTONE

To get products to overseas markets required a town and a port. So grew Ōamaru – a unique Victorian town full of grand neo-classical limestone buildings. This was truly a Whitestone City in its heyday. Why does this tiny town have so many grand limestone buildings? The choice was simple. There were few trees and the abundant limestone was easy to cut and shape and proved to be a durable building material.

A GEOLOGICAL WONDERLAND

The Waitaki region has diverse geology - It is not all limestone! Ōamaru town is built on a long-extinct volcano. The Moeraki Boulders are massive rock spheres eroding from a coastal outcrop. At Ōmārama, there are the eroding bad-lands of “Clay Cliffs” while near Duntroon are the huge limestone hummocks of “Elephant Rocks”. Many interesting and varying geological features form a “trail” for you to see and explore.

FOSSILISED FINDS

There are fossils in the limestone and other rocks. The challenge is to find them! Fossils have been extracted and examined by scientists to help understand the origins of modern species. Other important fossils now bear names from the local area. "In situ" fossils – whales in the rock - can be seen at Anatini and Earthquakes. These are stunning unique geological sites that take the viewer’s imagination back through deep time.

A STORY WITHOUT AN END...

...the opportunities are there, and like the fossils, they are waiting to be discovered.
4. SUPPORTING MATERIALS

[2.1] LOCATION ..........................................................
Coordinates, boundaries or a map showing proposed geopark's location. ........ 60

[2.2] SCIENTIFIC RESEARCH ....................................
Three examples of national and international peer reviewed and published scientific research about the proposed geopark. .............. 61

[2.3] MĀTAURANGA ............................................
Three transcripts of oral statements about the mātauranga (indigenous knowledge) that is available to recognise the special qualities of your site. .............. 70
[2.1] LOCATION

UNESCO area: Oceania

Country: New Zealand, South Island

Region: Otago District: Waitaki

Area total: 7,214 km²

Coordinates of largest Town (Ōamaru):
Latitude: 45° 5’ 51.04” South,
Longitude: 170° 58’ 13.49” East
A new genus and species of eomysticetid (Cetacea: Mysticeti) and a reinterpretation of ‘Mauicetus’ lophocephalus Marples, 1956: Transitional baleen whales from the upper Oligocene of New Zealand

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The early evolution of toothless baleen whales (Chaomysticeti) remains elusive, despite a robust record of Eocene–Oligocene archaeocetes and toothed mysticetes. Eomysticetids, a group of archaic longirostrine and putatively toothless baleen whales, fill in a crucial morphological gap between well-known toothed mysticetes and more crownward Neogene Mysticeti. A historically important but perplexing cetacean is ‘Mauicetus’ lophocephalus (upper Oligocene South Island, New Zealand). The discovery of new skulls and skeletons of eomysticetids from the Oligocene Kokoamu Greensand and Otekaike Limestone permit a redescription and modern reinterpretation of ‘Mauicetus’ lophocephalus, and indicating that this species may have retained adult teeth. *Tokarahia* kaeraon gen. et sp. nov. is erected on the basis of a well-preserved subadult to adult skull with mandibles, tympanoperiotics, and cervical and thoracic vertebrae, ribs, sternum, and forelimbs from the Otekaike Limestone (>25.2 Mya). ‘Mauicetus’ lophocephalus is relatively similar and recombined as *Tokarahia* lophocephalus. Phylogenetic analysis supports the inclusion of *Tokarahia* within the Eomysticetidae, alongside *Eomysticetus*, *Micromysticetus*, *Yamatocetus*, and *Tohoraata*, and strongly supports the monophyly of Eomysticetidae. *Tokarahia* lacked extreme rostral kinesis of extant Mysticeti, and primitively retained a delicate archaeocete-like posterior mandible and synovial temporomandibular joint, suggesting that *Tokarahia* was capable of, at most, limited lunge feeding in contrast to extant Balaenopteridae, and used an alternative as-yet unspecified feeding strategy.

doi: 10.1111/zoj.12297

A monogenetic, Surtla-type, Surtseyan volcano from the Eocene-Oligocene Waiareka-Deborah volcanics, Otago, New Zealand: a model

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Abstract. The relics of a small, monogenetic, continental-shelf, Surtseyan volcano are preserved on the North Otago coast, South Island, New Zealand, in the late Eocene-early Oligocene Waiareka-Deborah volcanics. The succession consists of two parts, i.e. a lower interval of bedded lapilli tuffs and lapilli-stones, representing the eruptive, aggradational-cone-building phase, and an upper epiplectic sequence, representing the post-eruptive degradational phase. All of the preserved succession appears to have been deposited below storm wave base. The lapilli tuffs and lapilli-stones are subaqueous, sheet deposits, modified contemporaneously by downslope grain flow and turbidity current redeposition, and perhaps by local reworking caused by turbulent thermal eddies. The absence of major discordances in the lapilli tuffs suggests that the active eruptive period was very short-lived, perhaps lasting only a few days. The epiplectic succession consists of redeposited volcanic, skeletal, lime mud and gauconitic detritus, transported by debris flows and other mass flows. The initial lapilli unit, a debris flow, appears to represent the sector collapse of a significant part of the cone. The appearance of fossils and rounded clasts low in the lapilli sequence coincides with stabilisation of the top of the submarine volcanic edifice, development of a wave-planed top, and its colonisation by a diverse fauna. Periodic storm activity swept material off the platform, redepositing it as marginal talus ramps. Surtse, a wholly submarine satellite volcanic centre of the 1963–1967 eruptive activity of Surtsey, is an excellent modern analogue for both the eruptive and post-eruptive phases of the Bridge Point-Aorere Point volcanic centre. By analogy with Surtse, the 120 metres of lapilli tuffs and lapilli-stones exposed on Bridge Point and Aorere Point accumulated in only several days. The 25 metres of reworked, gauconitic and fossiliferous volcanoclastics, represent thousands of years based on the time required for gauconite to form.

Introduction

The 1963–1967 development and eruption of the basaltic, island volcano Surtsey and its satellite vents in the Westman Islands south of Iceland (Thorarinsson et al. 1964; Thorarinsson 1967) provided a unique opportunity to understand shallow-marine, basaltic, phreatomagmatic eruptions and deposits, which have become formally known as Surtseyan-type (Walker 1973). Many aspects of the geology of Surtsey have been studied, and as a result we know much about its eruption style (Thorarinsson et al. 1964; Thorarinsson 1967; Kokelaar 1983, 1986; Moore 1967), the nature of the products (Jakobsson 1978; Jakobsson and Moore 1980, 1982; Lorenz 1974; Walker and Crossdale 1972), the degradational history (Norman 1970; Kokelaar and Durant 1983) and the post-depositional lithological changes (Jakobsson 1972, 1978; Jakobsson and Moore 1980, 1982). However, apart from the one drill hole into the edifice of Surtsey (Jakobsson and Moore 1980, 1982) and a cursory account of several Surtseyan cones on Marion and Prince Edward Islands in the southwest Indian Ocean (Verwoerd and Chevallier 1987), little is known about the internal stratigraphy and submarine history of Surtseyan volcanic centres.

Excellent coastal exposures of dissected, Tertiary, marine basaltic volcanic rocks occur on the
A NEW MARINE REPTILE (SAUROPTERYGIA) FROM NEW ZEALAND: FURTHER EVIDENCE FOR A LATE CRETACEOUS AUSTRAL RADIATION OF CRYPTOCLIDID PLESIOSAURS

by ARTHUR R. I. CRUICKSHANK and R. EWAN FORDYCE

ABSTRACT. Kāiwheka katiki gen. et sp. nov. represents the first described cryptoclidid plesiosaurian from New Zealand. It is one of the largest cryptoclidids known, at a length of over 6.5 m, and represents the third reported genus of austral Late Cretaceous cryptoclidids. Kāiwheka katiki is from siltstones of the Katiki Formation, upper Hauterivian Stage (Cenomanian–Maastrichtian; c. 69–70 Ma) of coastal Otago, South Island, New Zealand. In the Late Cretaceous, the locality lay close to the polar circle. The holotype and only known specimen is an articulated skeleton with skull, preserved mostly as natural molds, but which lacks the forelimbs and pectoral girdle. The skull is relatively large and possesses several distinct characters, including a substantial, deep, jugal. There are about 43 upper and 42 lower teeth in each jaw quadrant; all are homodont, slim, and slightly recurved, lacking prominent ornament. Kāiwheka probably took single soft-bodied prey. Based on cranial structure, it clearly belongs with the Cryptoclididae, but is not certainly close to the southern Late Cretaceous cryptoclidid Mortunera (Seymour Island, Antarctica) and Aristonectes (Chile, Argentina).

KEY WORDS: biogeography, systematics, stratigraphy, anatomy, plesiosaur, Sauropterygia, Cretaceous, New Zealand.

THE Plesiosauria is a group of extinct neodiapsid reptiles of uncertain, but probable, lepidosaurian affinity (Benton 1993), which were highly adapted for active life in a marine habitat. They range in age from the mid Triassic to the Late Cretaceous, and are of world-wide distribution. Plesiosaurs are conspicuous elements in Late Cretaceous assemblages from New Zealand, where elasmosaurs are known from two reliably named species and an indeterminate species, while pliosaurs encompass one or two indeterminate species. Most of the described specimens comprise isolated skulls, or postcrania without associated skulls (Hector 1874; Welles and Gregg 1971; Wiffen and Moisley 1986). This article establishes a new genus and species of plesiosauroid plesiosaurian (sensu Brown 1981, 1994) for a substantially complete specimen from Shag Point, coastal Otago, South Island, New Zealand (Text-figs 1–3).

The fossil is significant because it is the first nearly complete, articulated plesiosaurian to be described from New Zealand. It provides the first record of a cryptoclidid for New Zealand, and is one of only a few cryptoclidids from the Upper Cretaceous. It is also one of the latest to occur in the Cretaceous (Text-fig. 1A–C), close to the Cretaceous/Tertiary boundary. Finally, palaeogeographic reconstructions indicate that this is one of the most southern localities at which Cretaceous plesiosaurs have been recovered (Cabrera 1941; Casimiquela 1969; Brown 1981; Chatterjee and Zinsmeister 1982; Chatterjee et al. 1985; Chatterjee and Small 1989).

The Shag Point plesiosaur has been reported on, albeit briefly, several times (Fordyce 1983a, b, 1986, 1987, 1991; Thornton 1985), including identification as a presumed elasmosaur. This is the first formal description of the fossil.

Most of the primary research on New Zealand plesiosaurs was carried out from the 1860s to 1890s, a time of intense early surveying of local palaeontology and stratigraphy. Richard Owen (1861, 1862, 1870) was first to name a New Zealand species (Plesiosaurus australis Owen, 1861), but New Zealand-based geologists trained in Europe made other contributions. Activity centred on Cretaceous sequences in eastern

ECLOGITIC AND OTHER INCLUSIONS IN THE MINERAL BRECCIA MEMBER OF THE DEBORAH VOLCANIC FORMATION AT KAKANUI, NEW ZEALAND

JOHN S. Dickey, Jr., Department of Geology, University of Otago, Dunedin, New Zealand.

ABSTRACT

Lapilli tuff of the Deborah Volcanic Formation formed from two early Oligocene eruptions of basalt or atlantic magma followed by an eruption of melanephelinite magma containing xenoliths of lherzolite, eclogite, hornblendeite, pyroxenite and granulite, xenocrysts of hornblende, anorthoclase, ilmenite and coarse grained aggregates of pyrope and augite. Multiphase fluid inclusions, probably dominated by liquid CO$_2$, occur in almost all phases of the xenoliths and xenocrysts. Most of the xenoliths, except those of hornblendeite, have undergone solid-state deformation. Possible partial fusion zones occur along garnet-amphibole and garnet-pyroxene grain boundaries. Compound xenoliths show lherzolite in contact with hornblendeite and eclogite. Lherzolite and the melanephelinite show reaction relationships.

The lherzolite, eclogite, granulite, pyroxenite and, possibly, hornblendeite are believed to have come from an association of basic and ultrabasic rocks at depth. The melanephelinite magma was probably created from basaltic magma, chiefly by the extraction of anorthoclase, pyrope and clinopyroxene.

Six chemical analyses, optical and X-ray data are presented.

INTRODUCTION

Near Kakanui, east coast, South Island, New Zealand (S. Lat. 45º, E. Long. 171º) basaltic lapilli tuffs of the Lower Oligocene Deborah Volcanic Formation lie between the Upper Eocene Tutara Limestone (marine tufaceous biomicrite) and the Middle Oligocene McDonald Limestone (marine biostromalite). Details of the regional geology will be found in Gage (1957), and Coombs and Dickey (1965).

The Deborah Volcanic Formation at Kakanui consists of three units separated by angular unconformities, in downward order:

(3) Mineral Breccia Member
(2) Tuff II
(1) Tuff I

The maximum thicknesses of the three members, as exposed north of the mouth of the Kakanui River, are: (1) 55 feet, (2) 150-200 feet, (3) 150 feet.

Tuffs I and II are composed of glassy and crystalline lapilli of alkaline olivine basalt or olivine. The Mineral Breccia represents a final eruption of melanephelinite magma. It contains numerous xenolithic frag-
6.

Waipatia maerewhenua, New Genus and New Species (Waipatiidae, New Family), an Archaic Late Oligocene Dolphin (Cetacea: Odontoceti: Platanistoidea) from New Zealand

R. Ewan Fordyce

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ABSTRACT—Waipatia maerewhenua, from the Otekaike Limestone (late Oligocene), Waitaki Valley, New Zealand, is a new genus and species in a new family Waipatiidae (Odontoceti: Platanistoidea) near the base of the radiation of platanistoids. Its features include skull about 600 mm long, rostrum long and narrow; incisors long, procumbent, and gracile, cheek teeth heterodont and polydont; maxillae telescoped back over foramina toward supracraniun; parietal narrowly exposed on vertex; pterygoid sinus fossa restricted to basisphenoid; and palatine broad and not invaded by pterygoid sinus fossa. Features of the tympano-periotic, periotic fossa, and foramen spinosum indicate platanistoid relationships.

Waipatia maerewhenua is more closely related to the Squalodophini and Platanistini than to the Squallodontini. Of the similar small dolphins previously identified as Squallodonta, Macrocebus umbilicus (late Oligocene, Germany) and Sachalinocetus choimessi (early or middle Miocene, Sakhalin) are possible waipatids. Micromus hectori (earliest Miocene, New Zealand) is a probable squalodontid. Protosqualodon marshi (early Miocene, New Zealand) is transferred to Notocetus (Squalodophini) as Notocetus marshi (new combination). Squalocetus daestinatus (late Oligocene, Caucausus) is probably a waipatid close to W. maerewhenua. These taxa reveal an early radiation of the Platanistoidea by the late Oligocene.

INTRODUCTION

This article describes a new family, new genus, and new species of late Oligocene marine platanistoid dolphin from New Zealand. Heterodont dolphins from Oligocene and Miocene rocks worldwide have played a key role in interpretations of cetacean evolution because they are transitional in grade between archaic Cetacea (Archaeoceti) and extant odontocetes. Waipatia maerewhenua meets traditional concepts of the Squalodontidae, a family often used for heterodont odontocetes, but is more closely related to the Squalodophi and Platanistoidea than to the Squallodontidae. It is an early member of the platanistoid radiation that led to diverse Miocene taxa and ultimately to the two extant species of “river dolphins” of the genus Platanista; the latter represent the last of the Platanistoidea and, probably, the superfamily Platanistoidea. Waipatia maerewhenua thus has implications for odontocete history and for defining and delimiting the Squalodophi, Squallodontidae, and Platanistoidea.

The article has three main sections: (1) a description reviewing morphology and commenting on other taxa as needed to help interpret holotype, (2) a comparison covering broader aspects of morphology, homology, and function, and (3) cladistic relationships. A new combination, Notocetus marshi (Dickson, 1964) (Platanistoidea: Squalodophi), is used throughout for the so-called Protosqualodon marshi of New Zealand.

MATERIAL AND METHODS

Descriptions are based on the right or left side, whichever is more informative, with differences between right and left mentioned only if asymmetry is evident. Unreferenced statements about morphology are based on personal observations. The specimen was prepared with pneumatic chisels and scrapers. Fine details were prepared under a microscope with an ultrasonic dental scaler and an air-abrasive unit; some sutures could not be traced fully because the cancellous bone is friable and not permineralized. Photographs were taken with a 35-mm Asahi Pentax camera with a 50-mm macro lens. Illustrations derived from photographs are not corrected for parallax.

Acronyms used here are MNMZ Ma, marine mammal catalog in the National Museum of New Zealand, Wellington, New Zealand; OM C and OM A, catalogs in Otago Museum, Dunedin, New Zealand; OU fossil catalog in Geology Museum, University of Otago, Dunedin, New Zealand; USNM, Department of Paleobiology, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

SYSTEMATICS

Order Cetacea Brison, 1762
Suborder Odontoceti Flower, 1867
Superfamily Platanistoidea Simpson, 1945
Family Waipatiidae, new

Type genus—Waipatia, new genus.

Included genera—Waipatia, new genus, only.

Diagnosis—As for the only included species, Waipatia maerewhenua, in the only included genus, Waipatia, below.

Comment.—The family probably includes Squalocetus daestinatus Mchelidze, 1976 (late Oligocene, Caucausus), and may include species of Microcetus and Sachalinocetus; these are discussed below.

Genus Waipatia, new

Type species—Waipatia maerewhenua, new species.

Included species—Waipatia maerewhenua, new species, only.

Diagnosis—As for the only included species, Waipatia maerewhenua, below.

Etymology.—From the Maori name Waipati, a place near the type locality. Probable derivation: wai, water; pāti, shallow. Regarded as indeclinable. Pronunciation: wa-pa-ti, with a pronounced as in English "far," and as in "the."

Waipatia maerewhenua, new species

Figs. 2–8, 9b, 10a–k, 11, 12, 13a–g


Type locality.—North-facing cliff near Waipati Creek, 5 km west-southwest of Duntroon and 1.2 km north of "The Earthquakes," North Otago (Fig. 1). Grid reference: NZMS [New...
NEW FOSSIL PENGUINS (AVES, SPHENISCIFORMES) FROM THE OLIGOCENE OF NEW ZEALAND REVEAL THE SKELETAL PLAN OF STEM PENGUINS

INTRODUCTION

Fossil penguins have long been of interest to palaeontologists and the general public for their unique morphology, Austral distribution, and the ‘giant’ size attained by many species (Simpson, 1976; Fordyce and Jones, 1990; Jadhavitchuk, 2009; Ksepka and Ando, 2011). Despite the discovery of thousands of individual fossils of these flightless marine birds, there has long been little direct evidence of the overall body plan of Palaeogene penguins due to a scarcity of complete remains. This situation has improved with recent descriptions of associated skulls and postcranial material (Slack et al., 2006; Clarke et al., 2007, 2010; Ksepka and Ando, 2011). Still, no Palaeogene specimen preserving the trunk, hind limb, and forelimb of a single individual has previously been reported, and some parts of the skeleton have remained completely unknown. Thus standing height, proportions, and wingspan in stem Sphenisciformes have remained poorly constrained, hampering understanding of functional complexes and lifestyles. Here, we describe three associated skeletons from two new species that offer the first data on many key areas of skeletal anatomy.

New Zealand has the highest diversity of living penguins, and the continually expanding fossil record indicates a high level of penguin diversity throughout most, if not all, of the Cenozoic, with 19 formally named species (including those described here) and at least two distinct undescribed species reported to date (Fordyce and Thomas, 2011; Ksepka and Ando, 2011). Of note are the first-named fossil penguin, Palaeoodyptes antarcticus Huxley, 1859, and the oldest named penguin, Waimanu manneringi Jones, Ando, and Fordyce, in Slack et al., 2006. New Zealand fossil penguin records now span all Cenozoic epochs, and substantial subfossil material is also known (e.g., Worthy, 1997). Huxley (1859:675) first reported a fossil penguin more than 150 years ago, based on an incomplete tarsometatarsus (Fig. 7Q–R) from North Otago, New Zealand, that was “found by a native in the limestone of Kakanui [sic], and was brought to Mr. Mantell imbedded to some extent in a matrix which was readily recognizable as that particular limestone.” The single bone became the holotype for Huxley’s species Palaeoodyptes antarcticus. This early report had profound and perhaps unintended consequences on the later study of fossil penguins. Largely due to historical priority, and often with little justification, many fossils were later referred to Palaeoodyptes antarcticus. Furthermore, because a tarsometatarsus was the first penguin fossil to be described, this element was ascribed privileged status both in terms of functional complexes and lifestyles. Here, we describe three associated skeletons from two new species that offer the first data on many key areas of skeletal anatomy.

ABSTRACT—Three skeletons collected from the late Oligocene Kokoamu Greensand of New Zealand are among the most complete Palaeogene penguins known. These specimens, described here as Kairuku waitaki, gen. et sp. nov., and Kairuku grebneffi, sp. nov., reveal new details of key elements of the stem penguin skeleton associated with underwater flight, including the sternum, flipper, and pygostyle. Relative proportions of the trunk, flippers, and hind limbs can now be determined from a single individual for the first time, offering insight into the body plan of stem penguins and improved constraints on size estimates for ‘giant’ taxa. Kairuku is characterized by an elongate, narrow sternum, a short and flared coracoid, an elongate narrow flipper, and a robust hind limb. The pygostyle of Kairuku lacks the derived triangular cross-section seen in extant penguins, suggesting that the rectrices attached in a more typical avian pattern and the tail may have lacked the propping function utilized by living penguins. New materials described here, along with re-study of previously described specimens, resolve several long-standing phylogenetic, biogeographic, and taxonomic issues stemming from the inadequate comparative material of several of the first-named fossil penguin species. An array of partial associated skeletons from the Eocene–Oligocene of New Zealand historically referred to Palaeoodyptes antarcticus or Palaeoodyptes sp. are recognized as at least five distinct species: Palaeoodyptes antarcticus, Palaeoodyptes marplesi, Kairuku waitaki, Kairuku grebneffi, and an unnamed Burnside Formation species.

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Cucullaea inflexa, Römer, but the umbones are not so prominent, and the posterior angle is more acute.

Locality. Kelloway rock, near Trowbridge.

EXPLANATION OF PLATE XXX.

Fig. 1. Necula Philippini.
Fig. 2. Asteracta carinata.
Fig. 3. Asteracta.
Fig. 4. Corbula Macelliiii.
Fig. 5. Arca sublorangosa.
Fig. 6. Ammonites Regnaldi.


The remoteness of New Zealand, and the long period required for the transmission of specimens to England, together with the very limited information we at present possess of the geology and palaeontology of that interesting antipodean colony, impart a certain degree of importance to any accession of knowledge, however slight, relating to the physical structure, and the ancient fauna and flora of those distant islands.

These considerations induce me to submit to the Society the following remarks on a large collection of the bones of several species of Dinornis and other birds, of rock-specimens, and of fossil shells, corals, and infusoria, received a short time since from my eldest son, Mr. Walter Mantell, of Wellington; and although the information afforded by this collection respecting the geological structure of the country is but scanty, I would fain hope that this brief communication will not be deemed an uninteresting supplement to the memoir on the Fossil Birds of New Zealand, which I had the honour to lay before the Geological Society in 1848.

The specimens were accompanied by numerous sketches of the country, and a copy of the official report on the colonial capabilities of the eastern coast of the Middle Island, from Kaiapoi to Akaroa in Banks' Peninsula, and thence to the Scotch settlement at Otago, a distance of about 260 miles, made during my son's exploration of that tract in 1848, as Government Commissioner for the final settlement of native claims.

Such parts of this report as throw light on the geology of the Middle Island of New Zealand, together with remarks on any particular locality, are embodied in the following extracts. As an apology for the brevity of his notes, my son dwells on the arduous character of a pedestrian journey through a country but very thinly inhabited; the engrossing nature of his official duties, and the limited time.
1. Introduction

Continental monogenetic volcanic fields are commonly characterized by low magma supply rates over relatively long periods of time (Connor et al., 2000; Németh, 2010). We accept the traditional view that a monogenetic volcano is one formed by a single eruption (e.g. Wood, 1979). According to Walker (1993), composite polygenetic volcanoes develop where magma is supplied sufficiently frequently to maintain a single thermal pathway to the surface; whereas in monogenetic volcanic fields batches of magma ascend at such long time intervals that plumbing systems freeze before a new ascent of magma begins. The loss of this thermally favourable pathway means that the new magma batch has to create a new pathway to the surface (Walker, 1983; Németh, 2010). Other studies have revealed magma-supply complexities within monogenetic volcanoes, including multiple sources that feed eruption pulses rather than one source and a continuous eruption (Keating et al., 2008; Díez et al., 2009; Brenna et al., 2010; Valentine and Hirano, 2010; Brenna et al., 2011). In other fields it has been demonstrated that an apparently single edifice holds products of more than one volcano, for example the Heimaey volcanic centre, Iceland (e.g. Jakobsson, 1968), small ‘satellite’ vents on the east rim of the volcano (e.g. White and Schmincke, 1999; Klügel et al., 2000) and Lookout Bluff, northeast Otago, New Zealand (Maicher, 2003). This could be explained as simple random overlapping in a crowded field, the result of long-lived crustal features that repeatedly deliver magma preferentially to certain sites, or the product of exceptionally “meltable” zones, or crustal storage, that repeatedly feed

Cape Wanbrow: A stack of Surtseyan-style volcanoes built over millions of years in the Waiareka–Deborah volcanic field, New Zealand

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A R T I C L E   I N F O
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Surtseyan volcanism
Monogenetic volcanism
Northwest Otago
Cape Wanbrow

A B S T R A C T
Volcanic fields typically include many small, monogenetic, volcanoes formed by single eruptions fed by short-lived magma plumbing systems that solidify after eruption. The Cape Wanbrow coastline of the northeast Otago region in the South Island of New Zealand exposes an Eocene–Oligocene intraplate basaltic field that erupted in Surtseyan style onto a submerged continental shelf, and the stratigraphy of Cape Wanbrow suggests that eruptions produced multiple volcanoes whose edifices overlapped within a small area, but separated by millions of years. The small Cape Wanbrow highland is shown to include the remains of 6 volcanoes that are distinguished by discordant to locally concordant inter-volcano contacts marked by biogenic accumulations or other slow-formed features. The 6 volcanoes contain several lithofacies associations: (a) the dominantly pyroclastic E1 comprising well-bedded tuff and lapilli-tuff, emplaced by traction-dominated unsteady, turbulent high-density currents; (b) E2, massive to diffusely laminated block-rich tuff deposited by grain-dominant cohesionless debris flows; (c) E3, broadly cross-stratified tuff with local lenses of low- to high-angle cross-stratification which was deposited by either subaerial pyroclastic currents or subaquously by unstable antidune- and chute-and-pool-forming supercritical flows; (d) E4, very-fine- to medium-grained tuff deposited by turbidity currents; (e) E5, bedded bioclastic-rich tuff with increasing glaucony content upward, emplaced by debris flows; (f) E6, pillow lava and inter-pillow bioclastic sediment; and (g) E7, hyaloclastite breccia. These lithofacies associations aid interpretation of the eruptive evolution of each separate volcano, which in turn grew and degraded during build-up of the overall volcanic pile. Sedimentary processes played a prominent role in the evolution of the volcanic pile with both syn- and post-eruptive re-mobilization of debris from the growing pile of primary pyroclastic deposits of multiple volcanoes separated by time. An increase in bioclastic detritus upsequence suggests that the stack of deposits from overlapping volcanoes built up into shallow enough waters for colonization to occur. This material was periodically shed from the top of the edifice to form bioclastic-rich debris flow deposits of volcanoes 4, 5 and 6. Since the eruption of Surtsey (1963–1965) many studies have been made of the resulting island, but the pre-emergent base remains submarine, unincised and little studied. Eruption-fed density currents that formed deposits of the volcanoes of Cape Wanbrow are inferred to be typical products of submarine processes such as those that built Surtsey to the sea surface.

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0377-0273/© 2015 Elsevier B.V. All rights reserved.
[2.3] MATAURANGA

1. Te Kaihīnaki  "Moeraki Boulders / Kaihīnaki"

Te Kaihīnaki is the Māori name for the Moeraki Boulders, situated on Koekohe Beach just north of Moeraki Peninsula. Te Kaihīnaki are the round food-baskets and water-carrying gourds of the Ārai-te-uru waka that capsized further down the coastline at Matakaea (Shag Point). The Ārai-te-uru brought kūmara from Hawaiki to Aotearoa. After visiting Te Ika-a-Māui (the North Island), the waka came down the east coast of Te Waipounamu (the South Island), where it encountered heavy seas. The baskets and gourds were lost overboard, forming the Moeraki boulders. The Ārai-te-uru continued further down the coast before capsizing at Matakaea (Shag Point). Many of the passengers went ashore to explore the land but did not return to the waka before daylight, instead transforming into many of the well-known geographical features of Te Waipounamu.

References:

2. Puketapu  "Puketapu"

Puketapu is a small hill overlooking Palmerston in North Otago. Puketapu was a passenger on the Ārai-te-uru waka that capsized off the coastline near Matakaea (Shag Point). After capsizing, many of the passengers went ashore to explore the land, however they needed to be back at the waka before daylight. Most did not make it, including Puketapu, and transformed into many of the well-known landmarks of Te Waipounamu. During the 1879 Smith-Nairn Royal Commission of Inquiry into the Ngāi Tahu land claims, local kaumātua Merekihereka Hape recorded Puketapu as a kāinga nohoanga (settlement) and kāinga mahinga kai (food-gathering place) where tuna (eels) and inaka (whitebait) were gathered.

References:

3. Waitaki  "Waitaki River"

The Waitaki is the large braided river that drains Te Manahuna (the Mackenzie Basin) and enters Te Moana-nui-a-Kiwa (the Pacific Ocean) on the east coast of Te Waipounamu. The name Waitaki, a Kāi Tahu variant of Waitangi, is a common place name throughout Polynesia. Although the specific tradition behind the name has been lost, it literally means “the waterway of tears” and is often referred to in whaikōrero (oratory) as representing the tears of Aoraki. The river was an important ara tawhito (traditional travel route), providing direct access to the rich inland mahinga kai resources of Te Manahuna and Central Otago. The use of mōkihi is strongly associated with the Waitaki, and is one of the few places where this traditional practice continues today. The river was an important source of mahinga kai, and numerous kāinga nohoanga (settlements) and kāinga mahinga kai (food-gathering places) were located on both sides of the river. The Waitaki is also well-known for the many rock art sites located in the numerous limestone outcrops and shelters spread throughout the valley.

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24th April 2018

Fergus Power
Chief Executive
Waitaki District Council
20 Thames Street
Private Bag 50058

Dear Fergus,

LETTER OF SUPPORT WAITAKI UNESCO GEOPARK STATUS

On behalf of Tourism New Zealand I would like to congratulate you on your work to date around your submission for Waitaki to become recognised as a UNESCO Geopark. In Tourism New Zealand’s role to market New Zealand internationally as a visitor destination, we support the development and enhancement of operations and attractions which are likely to enhance the experience and satisfaction of international visitors to New Zealand.

UNESCO is an internationally renowned governing body and UNESCO status is a globally recognised brand. If you are successful in your application, Waitaki will be the first UNESCO Geopark in Australasia and this will provide a compelling promotional destination message that we could use in offshore marketing and media materials.

Among our target audience of ‘Active Considerers’ [offshore people actively considering a trip to New Zealand] a key draw card is our landscapes and people & place storytelling. Waitaki’s UNESCO recognition would be a great addition to this.

There is also a significant audience in China who are actively interested in Geoparks. China is a priority target market for Tourism New Zealand and the addition of a Geopark to the New Zealand destination story would present an opportunity to tap into market.

With these reasons in mind I am pleased to provide this letter of support. We wish you the very best of luck with your submission and are hopeful of the opportunity to help you share your destination story on the world stage.

Kind regards,

Lauren Vosper
GM PR & Major Events
26 April 2018

New Zealand National Commission for UNESCO
c/- New Zealand Ministry of Education
PO Box 1666
Wellington

Dear Commissioners,

Letter of Support

The University of Otago is delighted to endorse the application of the Waitaki Whitestone Geopark to become a member of the UNESCO Global Geoparks Network.

Founded in 1869, the University of Otago was New Zealand’s first university. We are looking forward to celebrating our 150th birthday in 2019, and to the involvement of wide sectors of our local and regional communities in our celebrations. The University opened in July 1871 with a staff of just three Professors, one to teach Classics and English Language and Literature, another having responsibility for Mathematics and Natural Philosophy, and the third to cover Mental and Moral Philosophy and Political Economy. The following year a Professor of Natural Science joined the staff, James Gow Black, who travelled widely across the Otago region, giving popular talks on his specialist areas of geology and chemistry to schools, miners and other members of the public. Lectures in Mining were given at the University from 1872, and in 1878 a School of Mines was established.

We have a nationally distinct approach to the provision of teaching, research and service that draws on our history, our vision as a research-led university with an international reputation for excellence, and a mission which is anchored in a number of core institutional values. As a national university operating in an international context, we attract a diverse range of students from throughout New Zealand and from over 100 nations around the world.

The vast majority of our more than 20,000 students commence their studies as undergraduates on our main Dunedin campus. However, we also operate significant health sciences campuses in Wellington and Christchurch, specialist facilities in Auckland and Invercargill, and satellite facilities elsewhere in New Zealand. We also deliver a number of programmes (mainly in postgraduate health sciences) via distance learning, both nationally and offshore.

Built on our heritage in mining and earth sciences, Otago University now hosts the National School of Surveying and has one of New Zealand’s strongest and most highly regarded Departments of Geology. This Department is recognised internationally for the quality and
breadth of its research and its graduates, and for its strong links to the mining industry and to the special geology of the Otago-Southland region. The Department's research is linked strongly to the dynamic geology of New Zealand, with particular emphasis on process-related research tied to the "active" geology of the South Island, and to the evolution of our unique New Zealand biota.

The Geology Department has had a lengthy association with ‘Vanished World’, a geopark within the Waitaki district that has been operating for 17 years. As a result of this strong research and educational association with the current geopark, we are confident that the proposed Waitaki Whitestone UNESCO Global Geopark will be a success and also add significant opportunities for enhanced international collaboration in geoscience research and education.

The establishment of the Waitaki as a UNESCO Global Geopark will lead to a marked increase in numbers visiting the global geopark, and an increased opportunity for visitors to appreciate the unique geology of this area, and to engage in understanding of the geosciences, the complex landforms involved, and their interaction with biodiversity and sustainability.

We strongly recommend the Expert Advisory Panel and the New Zealand National Commission for UNESCO to approve the application of the proposed Waitaki Whitestone UNESCO Global Geopark to join the UNESCO Global Geoparks Network.

Yours sincerely,

Richard Blaikie
Deputy Vice-Chancellor (Research and Enterprise)
University of Otago
Dear Commissioners,

Letter of Support

Riverstone Kitchen is happy to endorse the application of the Waitaki Whitestone Geopark to become a member of the UNESCO Global Geoparks Network.

As a chef, I strongly believe in cooking with only the freshest, seasonal ingredients and I am passionate about local and ethically produced food. The fertile soils of the Waitaki are renowned for producing nationally-acknowledged produce, Jersey Benne potatoes, Brussel Sprouts, sunflower seeds and Kakanui soil-grown tomatoes. My own food ethos is reflected in the all-encompassing gardens that surround and define Riverstone Kitchen. Here we grow much of the produce we use, with the balance sourced directly from local suppliers, including Venison, Lamb, Pork, Beef and Salmon. To have such outstanding suppliers on our doorstep, means that all people should and can eat well.

The establishment of Waitaki as a UNESCO Global Geopark will lead to a marked increase in numbers visiting the global geopark, and local restaurants such as ours here at Riverstone Kitchen will play an important role. The high quality, local produce used to create dishes that visitors to our restaurant and the Waitaki Whitestone UNESCO Global Geopark will enjoy, will give them a unique experience of New Zealand, like no other.

We urge the Expert Advisory Panel and the New Zealand National Commission for UNESCO to approve the application of the proposed Waitaki Whitestone UNESCO Global Geopark to join the UNESCO Global Geoparks Network.

Yours sincerely

Bevan Smith
Owner
Riverstone Kitchen
Dear Commissioners

Letter of Support

The members of the Waitaki Valley Winegrowers Association are delighted to endorse the application of the Waitaki Whitestone Geopark to become a member of the UNESCO Global Geoparks Network.

Our wines are highly distinctive of their terroir. Located on the 45th Parallel South, the Waitaki Valley vineyards stretch along a 75 kilometre strip from the limestone escarpments above the village of Duntroon, up the south bank of the Waitaki River inland to the township of Omarama. This unique terroir combines the coastal breezes of the South Pacific with the dry, rain shadow cast by the Southern Alps. Typically the region enjoys hot, dry summers, cold winters and long dry autumns. These climatic characteristics overlay the complex geology of the Waitakian Limestones to produce distinctive wines highly reflective of their origin.

We pride ourselves on our wines taking their special character in part from the unique Waitaki limestone soils (as shown in our web site):

[eid:03208BD9-2D96-4E06-9347-65588C8F65FB@waitakidec.govt.nz]

There is little doubt that the establishment of the Waitaki as a UNESCO Global Geopark will lead to a marked increase in numbers visiting the global geopark, and a heightening of awareness of the interaction between the geology of this area and the products that we produce.

We urge the Expert Advisory Panel and the New Zealand National Commission for UNESCO to approve the application of the proposed Waitaki Whitestone UNESCO Global Geopark to join the UNESCO Global Geoparks Network.

Yours sincerely

Andrew Ballantyne
Chairman
Waitaki Valley Winegrowers Association
New Zealand National Commission for UNESCO
c/- New Zealand Ministry of Education
PO Box 1666
Wellington

Dear Commissioners,

Re: Letter of Support

As Chairperson of the Waitaki Tourism Association, I am delighted to endorse the application of the Waitaki Whitestone Geopark to become a member of the UNESCO Global Geoparks Network.

Located in the centre of New Zealand's beautiful South Island, and stretching from the Pacific Coast deep into the Southern Alps, the Waitaki District is one of New Zealand's fastest-growing travel destinations for both international and domestic visitors. Offering a wealth of unique experiences, from the historic and quirky town of Oamaru (considered by Lonely Planet to be "New Zealand's coolest town") to the wine-growing area of Kurow, and the world-famous coastal village of Moeraki with its iconic boulders and the historic town of Palmerston, the Waitaki District is a region that rewards a multiple-night visit.

The Waitaki Tourism Association is an independent organisation that unites all the myriad attractions and traveller-related services in the Waitaki District, and offers a one-stop resource for visitors to learn about the range of accommodations, restaurants, activities and other worthwhile destinations that our district has to offer. Our Association is excited at the prospect of the establishment of the Waitaki as a UNESCO Global Geopark. UNESCO endorsement will provide confidence to those considering visiting the Waitaki Whitestone UNESCO Global Geopark that their visit will be an excellent experience. The proposed global geopark has the potential to be the 'one waka' within which each tourism operator has a 'place' and the opportunity to tell their story, all paddling in unison towards a common goal - the delivery of a world-class Global Geopark and tourism/educational experience for our visitors, both domestic and international.

We urge the Expert Advisory Panel and the New Zealand National Commission for UNESCO to approve the application of the proposed Waitaki Whitestone UNESCO Global Geopark to join the UNESCO Global Geoparks Network.

Yours sincerely

[Signature]

James Glucksman
Chairperson
Waitaki Tourism Association
24 April 2018

Dear Commissioners.

LETTER OF SUPPORT

Whitestone Cheese is delighted to endorse the application of the Waitaki Whitestone Geopark to become a member of the UNESCO Global Geoparks Network.

Whitestone Cheese was founded in 1987 by my Father, Bob Berry, as a diversification during the 1980’s rural downturn and a series of crippling droughts. His experience in livestock trading was quickly applied to cheese trading. The original factory was set up in Oamaru in a converted garage with milk sourced from local farms and one variety, Whitestone Farmhouse was launched. The business slowly grew as an extension of the farming operation until today’s purpose-built factory was commissioned in 1998. In 2003, I joined the business and the farm was sold to concentrate on growing the exciting family enterprise. The factory now employs over 70 staff and includes a cheese shop and café and factory tours. I now oversee the business management, cheese making team and production.

We pride ourselves on our cheeses taking their special character in part from the unique Waitaki limestone soils (as shown in our website www.whitestonecheese.co.nz):
We believe that the Waitaki Whitestone Geopark is ideally suited to be Aotearoa’s first UNESCO Global Geopark. It exhibits multiple internationally unique geological and associated features, and is a highly attractive destination for travellers, with excellent transport links to the North (Christchurch International Airport), the South (Dunedin International Airport), and to the West (Queenstown International Airport). A rich diversity of existing tourism opportunities and infrastructure both within the proposed Waitaki Whitestone UNESCO Global Geopark and in surrounding districts mean that visitors to the proposed Waitaki Whitestone UNESCO Global Geopark will not only enjoy the depth and breadth of the geology, biodiversity, scientific education and human stories and interaction with that geology, but the tourism offerings available en route to, and from, the Geopark, including (of course), our magnificent cheeses.

I urge the Expert Advisory Panel and the New Zealand National Commission for UNESCO to approve the application of the proposed Waitaki Whitestone UNESCO Global Geopark to join the UNESCO Global Geoparks Network.

Yours sincerely

Simon Berry
CEO & Director
New Zealand National Commission for UNESCO  
c/o New Zealand Ministry of Education  
PO Box 1666  
Wellington  

Dear Commissioners  

Letter of Support  

Heliventures New Zealand Ltd is delighted to endorse the application of the Waitaki Whitestone Geopark to become a member of the UNESCO Global Geoparks Network.  

Heliventures NZ Ltd was established in 2009 and has provided a professional commercial and agricultural aerial service since 2011. Craig McMillan the owner/operator manages the Oamaru Base which services North Otago, South Canterbury and the McKenzie Country. We also operate a remote base in Invercargill which services Southland and Stewart Island.  

Heliventures offer a full range of agricultural and commercial services, from lifting to commercial transport. At Heliventures we pride ourselves in being one of the first operators in NZ to become AirCare accredited. This accreditation highlights Heliventures commitment to high safety standards, professionalism and efficiency in all aspects of our helicopter operation. Heliventures operate one Airbus AS350 B2 Squirrel and two MD-520N Notar helicopter from their base at the Oamaru Airport and three MD-520N Notar helicopters from Invercargill. Our helicopters are all finished with a leather interior and the Notar helicopters seat four passengers, while the B2 Squirrel seats six passengers.  

The establishment of the Waitaki as a UNESCO Global Geopark will lead to a marked increase in numbers visiting the global geopark, and local restaurants such as Riverstone Kitchen will play an important role is exposing these visitors to the extraordinarily high quality of the produce used to create the dishes that visitors to the Waitaki Whitestone UNESCO Global Geopark will enjoy.  

We have been introduced to the intention of the Waitaki Whitestone Geopark to seek nomination as an Aspiring UNESCO Global Geopark, and we consider that the geology, geomorphology and existing tourist attractions of the Waitaki and the proposed geopark area provide a strong (and unique) platform for the establishment of a successful Global Geopark.  

It is our intention to market helicopter tours of the Global Geopark as part of our tourism expansion plan.  

We urge the Expert Advisory Panel and the New Zealand National Commission for UNESCO to approve the application of the proposed Waitaki Whitestone UNESCO Global Geopark to join the UNESCO Global Geoparks Network.  

Yours sincerely  

Craig and Nicki McMillan  
Owner/Operators  
Heliventures New Zealand Ltd
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Mind map
Moeraki / Katiki boulders

Waitaki braided river/ sedimentary layers

Diatoms

Waitaki Whitestone Geopark - UNESCO Expression of Interest Application 2018

Moeraki boulders

Alps to ocean

Fossils of whales/ plesiosaurs embedded in limestone - taniwha? influences from Takiroa Maori rock art

Colours of Waitaki

Link between Victorian times - slide arranging & modern photography, science/geology meets culture & human artistic endeavour

Our Logo Story

Waitaki Whitestone Geopark

Aotearoa New Zealand

APPENDIX A
# APPENDIX B

Geosites & Geological Features [2.2]

## GEOSITES - LOCATION & DESCRIPTION

<table>
<thead>
<tr>
<th>SITE</th>
<th>NAME</th>
<th>DESCRIPTION</th>
<th>MAP LINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Waianakarua Limestone Bridge</td>
<td>The Waianakarua Bridges are built of Ototara limestone from near Oamaru (Oligocene, 32 Mybp) and they rest on Cretaceous marine sands with rare fossils (65-70 Mybp). These heritage listed structures were designed by John Turnbull Thomson in 1874 (North Branch) and 1869 (South Branch). Thomson was the Chief Surveyor of Otago Province and carried out the first survey of the province, publishing an Otago map in 1860.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>03</td>
<td>All Day Bay</td>
<td>The rock pools and geology of All Day Bay make it a favourite attraction for school trips and holiday makers. It shows deep-water mudstone of the Mount Harris Formation (Early Miocene, 20 Mybp) with fossil molluscs.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>04</td>
<td>Campbells Bay</td>
<td>At this gorgeous beach you can see ancient shrimp burrows in Ototara Limestone. These were enlarged by erosion about 30 Mybp. Younger Otekaike limestone was deposited over the eroded surface about 25 Mybp, and was overlain in turn by Gee Greensand and Mt Harris Formation.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>05</td>
<td>Kakanui North Head</td>
<td>Near the Kakanui River Mouth, dark mineral breccia contain crystals erupted from deep in the Earth’s crust 34+ Mybp. Layers - beds - formed as successive eruptions flowed away from the vent. This mineral breccia includes iherzolite, pyroxenite, garnet pyroxenite and granulite as well as megacrysts of garnet, clinopyroxene, kaersutite, and feldspar.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>07</td>
<td>Boatmans Harbour</td>
<td>Located on the east side of Cape Wanbrow, Boatman’s Harbour is accessible at low tide via Graves Track from Cape Wanbrow. Spectacular pillow lavas occur here, formed 34-36 Mybp when masses of molten extruded lava solidified on the sea floor. White limestone between the pillows represents original limey sediment. The pillows are overlain by volcanic debris; the sequence includes mud and sand reworked by currents, yellow-brown limestone with occasional fossils, and a thick red-brown sequence which includes large boulders. The eruptive vent was probably close to what is now Cape Wanbrow.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<td>Number</td>
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<td>Description</td>
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<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>08</td>
<td>Hutchinsons Quarry</td>
<td>The disused Hutchinsons Quarry is one of New Zealand's first geological reserves. Tufts and Ototara limestone at the base are overlain by a fossil cobble-beach and an important fossil brachiopod location in the Gee Greensand.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>09</td>
<td>Whiterocks Road Pillow Lava</td>
<td>Pillow lava has been exposed in the road cutting on the southwest intersection of SH1 and Whiterocks Road. This site illustrates a sequence of Waiareka Volcanics and Ototara Limestone</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>10</td>
<td>Cormacks Siding Diatomite</td>
<td>In the Taylors Quarry area, near Weston this is the type locality of many diatom species described by Grove and Sturt (1888) and subsequent workers. The classic Oamaru Diatomite locality. Obliterated by landscaping before 2000.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>11</td>
<td>Enfield dikes</td>
<td>This is one of the best inland exposures of igneous dikes in the Oamaru region. The sequence of several near-vertical sheets of basalt formed by multiple injections of lava.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>12</td>
<td>Flour Mill</td>
<td>Standing proudly in Ngapara, the old mill is made of local limestone. The coal that was used as an energy source was mined, 250m to the north east, from a seam in the Taratu Formation. Coal and associated quartz gravels, visible in a quarry 600m to the southeast, formed in swampy conditions about the Paleocene-Eocene before the land was submerged under sea</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<tr>
<td>13</td>
<td>Valley of the Whales</td>
<td>The Valley of Whales earned its name from the exciting discovery of whale and dolphin fossils in the surrounding Otekaike Limestone and in the underlying Kokoamu Greensand. The meandering Awamoko Stream has eroded the limestone in this area to create a spectacular landscape. Moa bones have been found in swampy settings in the valley.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>14</td>
<td>Anatini</td>
<td>Easily accessible and one of few natural limestone arches in New Zealand, Anatini has baleen whale bones on display nearby as part of Vanished World trail.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>15</td>
<td>Elephant Rocks</td>
<td>Many distinctive large hummocky rocks (elephant shaped outcrops) have been formed out of Otekaike Limestone which originated as a fossil rich marine sand 25 million years ago. The thick and flat-lying limestone has many joints caused by the uplift of the area. These joints, which cross each other, are readily eroded away by water eventually leaving isolated 'elephants'.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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</tr>
<tr>
<td>16</td>
<td>Earthquakes</td>
<td>Latitude: -44:52:27.575</td>
<td>Earthquakes have baleen whale bones on display, still partly embedded in rock, as part of Vanished World trail.</td>
</tr>
<tr>
<td>17</td>
<td>Prydes Gully Road Quarry</td>
<td>Latitude: -44:55:58.854</td>
<td>Adze marks remain in an old quarry which produced &quot;Waitaki Stone&quot; (Otekaike Limestone) for building. This is a different stone than the more widely known &quot;Oamaru Stone&quot;</td>
</tr>
<tr>
<td>18</td>
<td>Tokarahi Sill</td>
<td>Latitude: -44:56:25.663</td>
<td>This road cutting cliff exposes a section through a columnar-jointed basaltic sill or flow - formed when molten rock ran across the seafloor, about 40 mybp. In places, pillow lavas occur near the sill.</td>
</tr>
<tr>
<td>19</td>
<td>Huttons Bridge, Otago Schist</td>
<td>Latitude: -44:56:41.918</td>
<td>The Otago Schist that can be seen at Huttons Bridge is the oldest local rock, or basement, formed 150-180 Mybp. Then sandstone and siltstone were buried deeply and deformed by temperature and pressure to create light coloured quartz-rich and darker mica-rich layers. Gold bearing quartz veins developed later. In turn eroded quartz veins released gold to be reworked into younger sediments (eg Taratu Formation)</td>
</tr>
<tr>
<td>20</td>
<td>Vanished World</td>
<td>Latitude: -44:51:17.923</td>
<td>The community-inspired Vanished World Society was formed in the early 2000’s to help raise public awareness about the geology of the Waitaki district. The Society is active in promoting the science, conservation and appropriate use of fossils, outcrops, and landforms, through a process of education, science-communication and &quot;hands on experience&quot;.</td>
</tr>
<tr>
<td>21</td>
<td>Clay Cliffs</td>
<td>Latitude: -44:29:20.087</td>
<td>This stunning landscape of high, eroded, spectacular &quot;badland&quot; outcrops encourages people to wonder how this landscape was formed. The Clay Cliffs were first formed as gravels, sand and silt, in fresh-waters. The sediments, which were deposited about 4 million years ago, were buried and compacted, then uplifted and eroded. The finer-grained lower strata probably represent lakes, while the upper section includes ancient river gravels. These river gravels probably eroded off the growing Southern Alps. The Clay Cliffs were uplifted and tilted by a recently active nearby Ostler Fault.</td>
</tr>
<tr>
<td>22</td>
<td>Moeraki Boulders and Scenic Reserve</td>
<td>Latitude: -45:20:50.824</td>
<td>These striking spherical rocks can reach over 1 metre in diameter, and have formed a spectacular backdrop to photographs for over a century. Beyond the immediate visual appeal is an interesting geological story. The boulders at Moeraki (Paleocene) and Shag Point (Cretaceous) formed on ancient seafloor between 55 and 70 million Mybp. At the heart of each boulder is a pebble or fossil, which mud and lime slowly became cemented around. Spherical boulders may have formed around a shell while more irregular shapes may have formed around something much more unique.</td>
</tr>
<tr>
<td>23</td>
<td>Takiroa shelter rock drawings</td>
<td>Latitude: -44:50:34.321</td>
<td>These limestone overhangs offered early travellers shelter along a seasonal route up the Waitaki Valley. The rock art captured here includes images from abstract forms to bird and animal life and people and is an archaeological treasure.</td>
</tr>
</tbody>
</table>
### Brewery Hole

This is an excellent example of a karst topography. Dissolution of the limestone has created an underground drainage system with sinkholes and caves. The Maerewhenua river disappears into sinkholes and travels 4.5km underground to briefly emerge at this sunken limestone cave known as Brewery Hole. It was known in pre-European times and the water hole was seen as a source of pure, clean water. "Waikoakoa" translates as 'happy waters'.

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### Mount Charles

Mount Charles overlooks the Otepopo area. It was formed by a sill or horizontal intrusion of basalt (Waiareka Volcanics 35 Mybp)

[https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642](https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642)

### Waitaki River

Waitaki literally means the waterway of tears, symbolising the tears of Aoraki Mt Cook, the tallest mountain of New Zealand, as they flow along the Tasman River and spill into Lake Pukaki. The river is characterised by gravel beds, numerous channels and variable flows, this all culminates in them being geologically unusual. The upper part of the Waitaki Basin was formed thousands of years ago when glaciers retreated leaving behind beds of gravel and boulders. The processes of geological uplift, erosion and alluvial transport continue to maintain Waitakis braided river and the associated wetlands. Only Alaska, Canada and the Himalayas have the same extensive braided river systems that NZ has.

[https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642](https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642)

### Mount Royal

One of the prominent peaks in the Waihemo Area, Mount Royal was part of the Waipiata Volcanic Field. The lower part of Mount Royal is formed by marine sedimentary rocks, typical of Eastern Otago.

[https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642](https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642)

### Puketapu

Puketapu overlooks the Waihemo area and stands prominently to the east of the town of Palmerston. It was formed as a vent in the Waipiata Volcanic Field. A monument to Sir John McKenzie, a former Waihemo MP, stands at the top

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### Goodwood Wetland

Estuarine habitat with Salicornia saltmarsh, mudflats and sandspit. Valuable for waders and waterfowl, including Godwit, South Island and variable oystercatchers, pied stilt, banded dotterel, white faced heron, gull and shag species, and grey duck and grey teal. White fronted terns have been reported breeding on the sandspit, and fur seals have been recorded. The area is important for estuarine terrestrial invertebrates.

[https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642](https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642)

### Pukehiwitahi

This prominent peak of Cretaceous rocks is said to represent the one-armed captain of the Arai te uru canoe calling out for the return of the twin children of Hekura, which are now the Sister Hills west of Palmerston.

[https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642](https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642)

### Devils Bridge Wetland

This wetland is an important habitat for many species and is recognised as an area of Natural Significance in this Karst landscape. There are also caves surrounding the wetland containing solution holes and a shell bed layer.

[https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642](https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642)
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<th>Feature</th>
<th>Description</th>
<th>URL</th>
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</thead>
<tbody>
<tr>
<td>32</td>
<td>Kauru Hill</td>
<td>Kauru Hill is recognised as a significant natural feature in the Waitaki District Plan. Its distinctive peak is formed by a cap of basalt which protects the underlying sedimentary rock sequence from being eroded, resulting in a volcano-like shape.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<tr>
<td>33</td>
<td>Island Cliff</td>
<td>This limestone escarpment is one of the most important fossil vertebrate locations in the wider Waitaki Valley - particularly for fossil toothed and toothless whales, bony fish, and sharks. It is a significant natural feature in the Waitaki District Plan.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<tr>
<td>34</td>
<td>Fortification Hill</td>
<td>This significant natural feature is a stunning example of a limestone escarpment and also contains the geosites 15, Elephant Rocks and 14, Anatini</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>35</td>
<td>Table Hill</td>
<td>Great amounts of the Ahuriri are protected under the Waitaki District Plan for their outstanding natural beauty, including Table Hill. The edge of Table Hill follows the Ostler Fault.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>36</td>
<td>Cloud Hill</td>
<td>Cloud Hill is encompassed in the large amount of the Ahuriri area covered by the Waitaki District Plan area of outstanding natural beauty.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<tr>
<td>37</td>
<td>Ohau Moraines</td>
<td>This significant wetland complex is one of the largest wetland areas to be protected in recent years. Several rare and threatened plants can be found here such as the small summer green lily and coral broom.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
</tr>
<tr>
<td>38</td>
<td>Mount Trotter</td>
<td>Formed as part of the Waipiata Volcanic field the peak of Mt Trotter punctuates the Waihemo skyline at height of 587m.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<tr>
<td>39</td>
<td>Mount Pakihiwitahi / Mackenzie</td>
<td>Mount Mackenzie / Pakihiwitahi is one of the many significant peaks created by volcanic activity of the Waipiata Volcanic field in the Miocene period.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<td>40</td>
<td>Middle Mount</td>
<td>The middle mountain in a collection of conical peaks that dot the Waihemo skyline Middle Mount was created from lava flows that occurred during a period of activity in the Miocene as part of the Waipiata Volcanic field.</td>
<td><a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642</a></td>
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<td>41</td>
<td>Taieri Peak</td>
<td>Located immediately to the west of Palmerston, Taieri Peak was created from the activity of the Waipiata Volcanic field in the Miocene.</td>
<td>Latitude: -45:28:48.400 Longitude: 170:37:15.100</td>
</tr>
<tr>
<td>42</td>
<td>Mount Pleasant</td>
<td>Mount Pleasant is part of the group of volcanic peaks that punctuate the Waihemo area from activity throughout the Waipiata Volcanic field in the Miocene.</td>
<td>Latitude: -45:30:54.900 Longitude: 170:38:34.400</td>
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<tr>
<td>43</td>
<td>Round Hill</td>
<td>Round Hill is recognised as a significant natural feature in the Waitaki District Plan.</td>
<td>Latitude: -45:06:07.600 Longitude: 170:51:03.300</td>
</tr>
<tr>
<td>44</td>
<td>Sebastopol Hill</td>
<td>One of the many distinctive peaks that punctuate the North Otago landscape Sebastopol Hill is also culturally significant, overlooking heritage listed Totara Estate it carries the Brydone monument, the father of the New Zealand frozen meat industry.</td>
<td>Latitude: -45:07:36.505 Longitude: 170:53:16.817</td>
</tr>
<tr>
<td>45</td>
<td>Ahuriri</td>
<td>This geosite refers to the broader Ahuriri area and its special landscape value recognised with wide coverage as an area of outstanding natural beauty in the Waitaki District Plan and also as an outstanding land of regional significance by Environment Canterbury.</td>
<td>Latitude: -44:20:22.263 Longitude: 169:43:17.024</td>
</tr>
<tr>
<td>46</td>
<td>Earthquakes Escarpment North</td>
<td>This escarpment sits to the north of Earthquakes Road and is an important locality for fossil penguins, whales and dolphins and has been sited in a number of international publications.</td>
<td>Latitude: -44:51:36.415 Longitude: 170:38:35.758</td>
</tr>
<tr>
<td>47</td>
<td>Earthquakes Escarpment South</td>
<td>This escarpment is a significant natural feature in the landscape and contains geosite 16 where huge blocks of limestone tumbled when the land slumped thousands of years ago.</td>
<td>Latitude: -44:52:36.524 Longitude: 170:37:18.514</td>
</tr>
<tr>
<td>48</td>
<td>Duntroon Escarpment East</td>
<td>This escarpment contains multiple rock shelter sites and rock drawings and is an outstanding natural feature.</td>
<td>Latitude: -44:51:33.255 Longitude: 170:41:25.254</td>
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<tbody>
<tr>
<td>49</td>
<td>Beach Road Erosion</td>
<td>Today the Waitaki coastline is susceptible to erosion. Layers of High class volcanic topsoil, Loess and gravels with minimal vegetative cover erode easily and there is a lack of sedimentation to replenish the beach front. The dramatic affect of accretion can be seen on this closed section of road. Strata under the active beach sands and gravels - mainly rocks of the Mount Harris formation - are sometimes visible.</td>
</tr>
<tr>
<td>50</td>
<td>Brockmans Hill</td>
<td>Brockmans Hill is a significant natural feature in the North Otago landscape.</td>
</tr>
<tr>
<td>51</td>
<td>Teaneraki Cliff</td>
<td>Teaneraki Cliff is an escarpment recognised as a significant natural feature in the Waitaki District Plan</td>
</tr>
<tr>
<td>52</td>
<td>Teaneraki Escarpment</td>
<td>A prominent limestone escarpment</td>
</tr>
<tr>
<td>53</td>
<td>Waiareka Valley Escarpment</td>
<td>Ototara Limestone marks the right northern skyline with volcanic rocks in the slopes below</td>
</tr>
<tr>
<td>54</td>
<td>Canyon Creek Glacial stairway</td>
<td>Located on the southeast of Thurneysen Glacier, this is the best example in New Zealand of a glacial stairway exhibiting a range of glacial features.</td>
</tr>
<tr>
<td>55</td>
<td>Lindis Pass fault scarp</td>
<td>A recent fault scarp with &gt;1 m (W side up?) displacement and associated sag pond.</td>
</tr>
<tr>
<td>56</td>
<td>Ostler Fault zone, ‘The Knot’</td>
<td>Situated in the Ahuriri River plain ‘The Knot’ is a major 90 degree bend in an example of reverse fault movement. Terraces have maximum scarp heights of 15 m on surfaces c.20000 years old. This site is monitored for precise strain measurements</td>
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<tr>
<td>57</td>
<td>Corbies Creek macrofossils</td>
<td>This is an area of rich, Late Triassic, marine fossils in rocks of the Torlesse Supergroup/Rakaia Terrane situated in the headwaters of Long Gully.</td>
</tr>
<tr>
<td>58</td>
<td>Hawkdun Cirque</td>
<td>Formed by glacial activity this is a nationally important example of a well defined lake filled cirque.</td>
</tr>
<tr>
<td>59</td>
<td>Wharekuri Fault</td>
<td>A late Quaternary oblique slip fault characterised by horizontally offset stream gullies and spurs, and fault depression near range front to S. Secondary faulting (1 m dip slip-E side up on 70 degree reverse fault) and folding normal to fault trend.</td>
</tr>
<tr>
<td>60</td>
<td>Campbell Park molluscan fauna</td>
<td>In the stream east and hillside west of Campbell Park are sites with diverse late Oligocene (Waitakian) molluscan faunas</td>
</tr>
<tr>
<td>61</td>
<td>Kohurau patterned ground</td>
<td>A nationally significant, spectacular array of stony polygons and stone stripes located 1 km east of Kohurau peak, St Marys Range.</td>
</tr>
<tr>
<td>62</td>
<td>Lake Waitaki fossils</td>
<td>Shoreline outcrops produce well-preserved and diverse late Oligocene (Duntroonian) molluscs.</td>
</tr>
<tr>
<td>63</td>
<td>Wai O Toura Reserve</td>
<td>Wai O Toura Reserve is home to critically endangered plants such as the native cress Lepidium sisymbrioides and critically endangered Carmichaelia hollowayii among other threatened species. These are located in a rare limestone ecosystem containing diverse Waitakian molluscan fauna, and a geological holostratotype. The outcrop has produced significant fossils of bony fish, penguins, and cetaceans. It is an important archaeological site.</td>
</tr>
<tr>
<td>64</td>
<td>Livingstone Tapui Formation</td>
<td>These shallow marine sedimentary structures are an excellent exposure of Tapui formation</td>
</tr>
<tr>
<td>Number</td>
<td>Location</td>
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<tr>
<td>65</td>
<td>Robertson Creek</td>
<td>The transposition structures here show a stage in the development of schist not often observed</td>
</tr>
<tr>
<td>66</td>
<td>Rattling Rocks</td>
<td>Iron-brown to chocolate in colour these rocks can be found in the Maerwhenua River tributaries. They rattle due to the solvent action of groundwater on the iron content of the rock</td>
</tr>
<tr>
<td>67</td>
<td>Green Gully</td>
<td>On spur between Graysons Water Race and Green Gully is a good example of metamorphosed small pillow lava in a matrix of red haematitic marble.</td>
</tr>
<tr>
<td>68</td>
<td>Golden Point Battery</td>
<td>Wonderfully preserved stamper battery and the only authentic working example in Otago it will leave you in awe of the determination of early miners</td>
</tr>
<tr>
<td>69</td>
<td>Pigroot Creek reverse fault exposure</td>
<td>Located on the true right bank of Pigroot Creek is the best outcrop of the East Otago reverse fault system</td>
</tr>
<tr>
<td>70</td>
<td>Mt Dasher (Otepopo) slate</td>
<td>A disused slate quarry this is a good example of slate formation (and is the only site in NZ where roofing slate has been produced) near Mackerras Creek, tributary of Kauru River, east foothills of Kakanui Range.</td>
</tr>
<tr>
<td>71</td>
<td>Waianakarua North Branch</td>
<td>Excellent examples of metamorphosed pillow lava with prominent feldspar pseudomorphs (up to 2 cm) and sandstone dikes.</td>
</tr>
<tr>
<td>72</td>
<td>Nenthorn Goldfield</td>
<td>You can see barely any trace of what was once a gold boom town. The roadside features an example of a well exposed gold-bearing quartz veins that created this boom.</td>
</tr>
<tr>
<td>ID</td>
<td>Location</td>
<td>Description</td>
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</tr>
<tr>
<td>73</td>
<td>Kokoamu Bluff</td>
<td>Within 100m west of the road, this scarp has a mid Oligocene unconformity below brachiopod-rich Kokoamu Greensand and Otekaike Limestone. These strata have produced important fossil vertebrates, some of them reference or type specimens. <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>74</td>
<td>Ardgowan fossils</td>
<td>Diverse early Miocene (Altonian stage) macrofossil fauna occur at this site <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>75</td>
<td>Awamaoa Creek fossils</td>
<td>An archaeological site of middens/ovens recognised in the Waitaki District Plan. This site is also important for diverse early Miocene (Altonian Stage) macrofauna occasionally exposed on the beach <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>76</td>
<td>Bains Eocene diatomite</td>
<td>On a hillside west of Fortification Road Hill. Three small hillside escarpments. The lowest 10m thick escarpment is the richest. Of international significance this site is a classic Oamaru Diatomite locality, exposing stratigraphy of lower portion of deposits. Richest Oamaru Diatomite microflora known. <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>77</td>
<td>Bortons Eocene fossils</td>
<td>This is a nationally significant holostratotype of middle Eocene Bortonan Stage, represented by the Tapui Formation located near an old coal mine in the Taratu Formation. <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>78</td>
<td>Landon Creek bank</td>
<td>Two small exposures in banks on either side of North Branch of Landon (Boundary) Creek, 50 m upstream of the rifle range at the end of Landon Road. Featuring common Duntroonian brachiopods. Hypostratotype of Duntroonian Stage. <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>79</td>
<td>Lorne molluscan fossils</td>
<td>On the hillside below William’s Bluff, 30 m above an abandoned railway line this site has very diverse late Eocene (Kaiatan stage) molluscan fauna and unusual hard-bottom fauna. Holostratotype of disused Waiarekan Stage. <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>80</td>
<td>Pukeuri Miocene fossils</td>
<td>300 metres north of Pukeuri, on Pukeuri-Kurow highway this site has diverse Miocene (Altonian stage) macrofauna <a href="https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html#248c88b2-155e-4665-999d-a7b693642">Link</a></td>
</tr>
<tr>
<td>Site Name</td>
<td>Description</td>
<td>Location</td>
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<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Target Gully</td>
<td>One of most diverse Cenozoic macrofossil localities in New Zealand,</td>
<td>-45:05:12.958, 170:57:55.427</td>
</tr>
<tr>
<td>Shell Pit</td>
<td>historically important.</td>
<td></td>
</tr>
<tr>
<td>Cape Wanbrow</td>
<td>On the cliff section at gulch, 400 m east of Old Rifle Butts, south side of</td>
<td>-45:07:32.627, 170:58:03.827</td>
</tr>
<tr>
<td>Cliff</td>
<td>Cape Wanbrow, where Shirley Creek flows into the sea are rich fossil bird</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bone deposits of Last Interglacial age. Many are now extinct. Oldest known</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fossil tuatara bones.</td>
<td></td>
</tr>
<tr>
<td>Old Rifle Butts</td>
<td>To the south of Cape Wanbrow, 100-300m north of the golf course is a</td>
<td>-45:07:32.004, 170:57:51.513</td>
</tr>
<tr>
<td></td>
<td>section through Eocene pyroclastic volcano, superb and rare rhodolith</td>
<td></td>
</tr>
<tr>
<td></td>
<td>deposits of the MacDonald limestone. Also Pleistocene penguin and sea</td>
<td></td>
</tr>
<tr>
<td></td>
<td>eagle (?) remains and excellent raised Pleistocene beach. Richly fossiliferous, well exposed sedimentary sequence.</td>
<td></td>
</tr>
<tr>
<td>Weston wind</td>
<td>At the junction of Tokorahi Road and Kia Ora Road, Weston (northwest of</td>
<td>-45:04:44.193, 170:54:19.986</td>
</tr>
<tr>
<td>gap</td>
<td>Oamaru) this large wind gap cuts through high bluffs of Ototara limestone.</td>
<td></td>
</tr>
<tr>
<td>Jackson's</td>
<td>Known as Jackson’s Paddock, this site is an internationally important site</td>
<td>-45:05:14.340, 170:53:17.212</td>
</tr>
<tr>
<td>Paddock</td>
<td>of Eocene diatomite and Eocene-Oligocene boundary. Classic Oamaru Diatomite</td>
<td></td>
</tr>
<tr>
<td></td>
<td>locality (upper part of stratigraphic sequence) and overlying Totara</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limestone containing Eocene-Oligocene boundary.</td>
<td></td>
</tr>
<tr>
<td>Oamaru Court</td>
<td>A heritage listed building, this is one of the best examples of the work of</td>
<td>-45:05:55.735, 170:58:11.261</td>
</tr>
<tr>
<td>House</td>
<td>designers Forrester and Lemon and the best use of Oamaru Stone in New</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Zealand.</td>
<td></td>
</tr>
<tr>
<td>lava</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Site Description</td>
<td>Coordinates</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>89</td>
<td><strong>Landon Creek bluff</strong>&lt;br&gt;Situated on the low bluff in the creek where the north branch of Landon Creek leaves rolling hill country, this site is notable for the contact between Ototara Limestone overlying Kokoamu Greensand, and also for unconformity between thin Otekaike Limestone and overlying Gee Greensand.</td>
<td>Latitude: -45:02:00.248&lt;br&gt;Longitude: 170:59:47.989</td>
</tr>
<tr>
<td>90</td>
<td><strong>Alma fossil hardground</strong>&lt;br&gt;Located on the east side of SH1 in a cutting beside road ditch, this site has unique Eocene hardground fossil fauna (being the only known locality where a number of fossil bryozoa have been collected)</td>
<td>Latitude: -45:06:49.886&lt;br&gt;Longitude: 170:54:29.073</td>
</tr>
<tr>
<td>91</td>
<td><strong>Fortification Hill</strong>&lt;br&gt;Readily seen from state highway 1 this is a superb castle-shaped hill eroded into horizontally-bedded sequence of hard and soft units. The Ototara Limestone at Fortification Hill is the type horizon for the massive fossil penguin, Pachydyptes.</td>
<td>Latitude: -45:06:46.071&lt;br&gt;Longitude: 170:54:13.434</td>
</tr>
<tr>
<td>92</td>
<td><strong>Rakis Table</strong>&lt;br&gt;&lt;br&gt;The locality of the sedimentary rock, Raki Siltstone from the Eocene epoch. The flat ‘table top’ of Rakis table is a significant feature in the landscape. It was also the location of rain making efforts in the late 19th century when dynamite was set-off to 'seed' the clouds. At the base of Rakis table a disused rail tunnel is now part of the Alps 2 Ocean cycleway. There is a fantastic spot to view Rakis table at the intersection of Peaks and Conlans Road.</td>
<td>Latitude: -44:59:46.470&lt;br&gt;Longitude: 170:44:02.548</td>
</tr>
<tr>
<td>93</td>
<td><strong>Oamaru limestone dikes</strong>&lt;br&gt;In the road cutting on the north side of Chelmer Street, at the intersection with Chess St and opposite the botanic park in Oamaru, is one of best examples of limestone dikes into tuff in New Zealand.</td>
<td>Latitude: -45:05:51.531&lt;br&gt;Longitude: 170:57:39.913</td>
</tr>
<tr>
<td>94</td>
<td><strong>Awahokomo karst pinnacles</strong>&lt;br&gt;Karst pinnacles are the eroded remnants of thick sheets of Otekaie Limestone, which formed about 25 mybp, when the low land was surrounded by wide shallow seas.</td>
<td>Latitude: -44:42:16.477&lt;br&gt;Longitude: 170:22:37.184</td>
</tr>
<tr>
<td>95</td>
<td><strong>Bendhu Scientific Reserve</strong>&lt;br&gt;This is a special Scientific reserve administered by the Department of Conservation. The ‘wilderness’ vegetation of this area is the only stand of its kind in the Mackenzie basin, consisting of bog pine, mountain toatoa and other associated species.</td>
<td>Latitude: -44:25:04.926&lt;br&gt;Longitude: 169:52:15.257</td>
</tr>
<tr>
<td>96</td>
<td><strong>Shag Point Scientific Reserve</strong>&lt;br&gt;There are many rare plant and animal species in this very special area. Yellow-eyed penguins and sooty shearwaters breed here. It is a major haul-out for seals and a shag roosting area. Unusual coastal vegetation includes alpine species such as snow tussock, Celmesia hookeri, as well as broadleaf, ngaio, flax and clematis. This area includes Shag Point Recreation and Scientific Reserves.</td>
<td>Latitude: -45:28:00.851&lt;br&gt;Longitude: 170:48:35.236</td>
</tr>
<tr>
<td>Location</td>
<td>Latitude</td>
<td>Longitude</td>
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<tr>
<td>-------------------</td>
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<td>-------------------</td>
</tr>
<tr>
<td>Matakaea / Shag Point</td>
<td>-45:28:25.050</td>
<td>170:49:53.096</td>
</tr>
<tr>
<td>Moeraki Peninsula</td>
<td>-45:21:24.143</td>
<td>170:51:32.080</td>
</tr>
<tr>
<td>Trotters Gorge</td>
<td>-45:24:10.363</td>
<td>170:46:32.968</td>
</tr>
<tr>
<td>Dog Pound Quarry</td>
<td>-45:05:33.716</td>
<td>170:57:13.711</td>
</tr>
<tr>
<td>Livingstone fossil bug</td>
<td>-45:00:00.000</td>
<td>170:36:00.000</td>
</tr>
<tr>
<td>Site</td>
<td>Name</td>
<td>Geological Time</td>
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<tr>
<td>------</td>
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<td>-----------------</td>
</tr>
<tr>
<td>1</td>
<td>Waianakarua Limestone Bridge</td>
<td>Oligocene, Cretaceous</td>
</tr>
<tr>
<td>2</td>
<td>Bridge Point</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>3</td>
<td>All Day Bay</td>
<td>Miocene</td>
</tr>
<tr>
<td>4</td>
<td>Campbells Bay</td>
<td>Eocene, Oligocene Miocene</td>
</tr>
<tr>
<td>5</td>
<td>Kakanui North Head</td>
<td>Eocene</td>
</tr>
<tr>
<td>6</td>
<td>Ototara Limestone Cliffs</td>
<td>Eocene Miocene</td>
</tr>
<tr>
<td>7</td>
<td>Boatmans Harbour</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>8</td>
<td>Hutchinsons Quarry</td>
<td>Eocene, Miocene</td>
</tr>
<tr>
<td>9</td>
<td>Whiterocks Road Pillow Lava</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>10</td>
<td>Cormacks Siding Diatomite</td>
<td>Eocene Miocene</td>
</tr>
<tr>
<td>Site</td>
<td>Name</td>
<td>Geological Time</td>
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</tr>
<tr>
<td>11</td>
<td>Enfield dikes</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>12</td>
<td>Flour Mill</td>
<td>Paleocene, Eocene</td>
</tr>
<tr>
<td>13</td>
<td>Valley of the Whales</td>
<td>Oligocene, Eocene in places</td>
</tr>
<tr>
<td>14</td>
<td>Anatini</td>
<td>Oligocene</td>
</tr>
<tr>
<td>15</td>
<td>Elephant Rocks</td>
<td>Oligocene</td>
</tr>
<tr>
<td>16</td>
<td>Earthquakes</td>
<td>Oligocene</td>
</tr>
<tr>
<td>17</td>
<td>Prydes Gully Road Quarry</td>
<td>Oligocene</td>
</tr>
<tr>
<td>18</td>
<td>Tokarahi Sill</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>19</td>
<td>Huttons Bridge, Otago Schist</td>
<td>Jurassic</td>
</tr>
<tr>
<td>20</td>
<td>Vanished World</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Clay Cliffs</td>
<td>Pliocene</td>
</tr>
<tr>
<td>22</td>
<td>Moeraki Boulders and Scenic Reserve</td>
<td>Cretaceous, Paleocene</td>
</tr>
<tr>
<td>23</td>
<td>Takiroa shelter rock drawings</td>
<td>Oligocene (strata), Quaternary (landscape)</td>
</tr>
<tr>
<td>24</td>
<td>Brewery Hole</td>
<td>Oligocene (strata), Quaternary (landscape)</td>
</tr>
<tr>
<td>25</td>
<td>Mount Charles</td>
<td>Eocene?-Oligocene?</td>
</tr>
<tr>
<td>26</td>
<td>Waitaki River</td>
<td></td>
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<tr>
<td>Site</td>
<td>Name</td>
<td>Geological Time</td>
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<td>------</td>
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</tr>
<tr>
<td>27</td>
<td>Mount Royal</td>
<td>Paleocene, Eocene, Oligocene, Miocene</td>
</tr>
<tr>
<td>28</td>
<td>Puketapu</td>
<td>Miocene</td>
</tr>
<tr>
<td>29</td>
<td>Goodwood Wetland</td>
<td>Miocene</td>
</tr>
<tr>
<td>30</td>
<td>Pukehiwitahi</td>
<td>Cretaceous</td>
</tr>
<tr>
<td>31</td>
<td>Devils Bridge Wetland</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Kauru Hill</td>
<td>Eocene, ?Pliocene</td>
</tr>
<tr>
<td>33</td>
<td>Island Cliff</td>
<td>Oligocene (strata), Quaternary (landscape)</td>
</tr>
<tr>
<td>34</td>
<td>Fortification Hill</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Table Hill</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Cloud Hill</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Ohau Moraines</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Mount Trotter</td>
<td>Miocene</td>
</tr>
<tr>
<td>39</td>
<td>Mount MacKenzie/ Pakhiwitahi</td>
<td>Miocene</td>
</tr>
<tr>
<td>40</td>
<td>Middle Mount</td>
<td>Miocene</td>
</tr>
<tr>
<td>41</td>
<td>Taieri Peak</td>
<td>Miocene</td>
</tr>
<tr>
<td>42</td>
<td>Mount Pleasant</td>
<td>Miocene</td>
</tr>
<tr>
<td>43</td>
<td>Round Hill</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Sebastopol Hill</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Ahuriri</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Earthquakes Escarpment North</td>
<td>Oligocene</td>
</tr>
<tr>
<td>Site</td>
<td>Name</td>
<td>Geological Time</td>
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<tr>
<td>47</td>
<td>Earthquakes Escarpment South</td>
<td>Oligocene</td>
</tr>
<tr>
<td>48</td>
<td>Duntroon Escarpment East</td>
<td>Oligocene</td>
</tr>
<tr>
<td>49</td>
<td>Beach Road Erosion</td>
<td>Holocene, with modern erosion of Miocene strata</td>
</tr>
<tr>
<td>50</td>
<td>Brockmans Hill</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Teaneraki Cliff</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Teaneraki Escarpment</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Waiaareka Valley Escarpment</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Canyon Creek Glacial stairway</td>
<td>Glacial (Stairway)</td>
</tr>
<tr>
<td>55</td>
<td>Lindis Pass fault scarp</td>
<td>Fault (Scarp)</td>
</tr>
<tr>
<td>56</td>
<td>Ostler Fault zone, 'The Knot'</td>
<td>Quaternary</td>
</tr>
<tr>
<td>57</td>
<td>Corbies Creek macrofossils</td>
<td>Triassic</td>
</tr>
<tr>
<td>58</td>
<td>Hawkdun Cirque</td>
<td>Glacial (Cirque)</td>
</tr>
<tr>
<td>59</td>
<td>Wharekuri Fault</td>
<td>Fault</td>
</tr>
<tr>
<td>60</td>
<td>Campbell Park molluscan fauna</td>
<td>Oligocene (Waitakian)</td>
</tr>
<tr>
<td>61</td>
<td>Kohurau patterned ground</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Lake Waitaki fossils</td>
<td>Oligocene (Duntroonian)</td>
</tr>
<tr>
<td>63</td>
<td>Wai O Toura Reserve</td>
<td>Oligocene (Waitakian)</td>
</tr>
<tr>
<td>64</td>
<td>Livingstone Tapui Formation</td>
<td>Sedimentation</td>
</tr>
<tr>
<td>65</td>
<td>Robertson Creek</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Rattling Rocks</td>
<td>Eocene</td>
</tr>
<tr>
<td>67</td>
<td>Green Gully</td>
<td>Volcanic (Pillow Lava)</td>
</tr>
<tr>
<td>Site</td>
<td>Name</td>
<td>Geological Time</td>
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<tr>
<td>68</td>
<td>Golden Point Battery</td>
<td></td>
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<tr>
<td>69</td>
<td>Pigroot Creek reverse fault exposure</td>
<td></td>
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<tr>
<td>70</td>
<td>Mt Dasher (Otepopo) slate</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Waianakarua North Branch</td>
<td>Volcanic (Pillow Lava)</td>
</tr>
<tr>
<td>72</td>
<td>Nentnorn Goldfield</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Kokoamu Bluff</td>
<td>Oligocene</td>
</tr>
<tr>
<td>74</td>
<td>Ardgowan fossils</td>
<td>Miocene</td>
</tr>
<tr>
<td>75</td>
<td>Awamoa Creek fossils</td>
<td>Miocene</td>
</tr>
<tr>
<td>76</td>
<td>Bains Eocene diatomite</td>
<td>Eocene</td>
</tr>
<tr>
<td>77</td>
<td>Bortons Eocene fossils</td>
<td>Eocene (Bortonian Stage)</td>
</tr>
<tr>
<td>78</td>
<td>Landon Creek bank</td>
<td>Oligocene (Duntroonian)</td>
</tr>
<tr>
<td>79</td>
<td>Lorne molluscan fossils</td>
<td>Eocene (Kaiatan Stage)</td>
</tr>
<tr>
<td>80</td>
<td>Pukeuri Miocene fossils</td>
<td>Miocene (Altonian)</td>
</tr>
<tr>
<td>81</td>
<td>Target Gully Shell Pit</td>
<td>Miocene</td>
</tr>
<tr>
<td>82</td>
<td>Totara Brachiopod fauna</td>
<td>Eocene (Runungan)</td>
</tr>
<tr>
<td>83</td>
<td>Cape Wanbrow Cliff</td>
<td>Cenozoic (Pleistocene)</td>
</tr>
<tr>
<td>84</td>
<td>Old Rifle Butts</td>
<td>Eocene, Miocene, Pleistocene</td>
</tr>
<tr>
<td>85</td>
<td>Weston wind gap</td>
<td>Erosion (Aeolian)</td>
</tr>
<tr>
<td>86</td>
<td>Jackson’s Paddock</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>87</td>
<td>Oamaru Court House</td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td>Name</td>
<td>Geological Time</td>
</tr>
<tr>
<td>------</td>
<td>----------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>88</td>
<td>Weston pillow lava</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>89</td>
<td>Landon Creek bluff</td>
<td>Oligocene</td>
</tr>
<tr>
<td>90</td>
<td>Alma fossil hardground</td>
<td>Eocene</td>
</tr>
<tr>
<td>91</td>
<td>Fortification Hill</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>Rakis Table</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>93</td>
<td>Oamaru limestone dikes</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>94</td>
<td>Awahokomo karst pinnacles</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>Bendhu Scientific Reserve</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>Shag Point Scientific Reserve</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>Matakea / Shag Point</td>
<td>Late Cretaceous</td>
</tr>
<tr>
<td>98</td>
<td>Moeraki Peninsula</td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>Trotters Gorge</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Dog Pound Quarry</td>
<td>Eocene, Oligocene</td>
</tr>
<tr>
<td>101</td>
<td>Livingstone fossil bug</td>
<td>Neogene</td>
</tr>
</tbody>
</table>
## APPENDIX C

### Legal protection [2.5]

<table>
<thead>
<tr>
<th>SITE</th>
<th>NAME</th>
<th>ACCESS DESCRIPTION</th>
<th>PROTECTION</th>
<th>IMPORTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Waianakarua Limestone Bridge</td>
<td>The bridge is viewable from the small parking area near the railway</td>
<td>Bylaw: Dogs on-lead only Owner: WDC District Plan: Heritage Item 101 &amp; 102 Category A &amp; B Heritage NZ: Item 348 and 2436 Category I and II</td>
<td>Regional</td>
</tr>
<tr>
<td>2</td>
<td>Bridge Point</td>
<td>Public beach access - parking spaces exist along top of the hill</td>
<td>Waitaki District Plan: Significant Coastal Landscape Reserve: Marginal Strip Land Act 1948 Statutory: Marginal Strip Land Act 1948</td>
<td>Local</td>
</tr>
<tr>
<td>3</td>
<td>All Day Bay</td>
<td>Public beach access</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>4</td>
<td>Campbells Bay</td>
<td>Public beach access</td>
<td>Waitaki District Plan: Designation 147 Kakanui Esplanade Reserve</td>
<td>Regional</td>
</tr>
<tr>
<td>5</td>
<td>Kakanui North Head</td>
<td>Publically accessible along beach at low tide</td>
<td>Waitaki District Plan: Significant Coastal Landscape Statutory: Conservation Purposes Act 1987 Owner: Conservation Department</td>
<td>International</td>
</tr>
<tr>
<td>6</td>
<td>Ototara Limestone Cliffs</td>
<td>Parking available along roadside at places. Please take care as the coastline is subject to erosion</td>
<td>Waitaki District Plan: Significant Coastal Landscape</td>
<td>Local</td>
</tr>
<tr>
<td>7</td>
<td>Boatmans Harbour</td>
<td>Accessible via Cape Wanbrow Track connecting onto Graves Track</td>
<td>Waitaki District Plan: Significant Coastal Landscape, Designation 123 Recreation Bylaw: Dogs Prohibited Owner: Conservation Department</td>
<td>International</td>
</tr>
<tr>
<td>9</td>
<td>Whiterocks Road Pillow Lava</td>
<td>Not safely viewed on foot due to the State Highway. This site may be concealed by overgrowth.</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>10</td>
<td>Cormacks Siding Diatomite</td>
<td>Located on private land permission required. Nothing remains of this scientific site.</td>
<td></td>
<td>International</td>
</tr>
<tr>
<td>11</td>
<td>Enfield dikes</td>
<td>View from track. Please take care crossing A2O cycleway</td>
<td>Waitaki District Plan: Designation 80 Closed Landfill and Refuse Transfer Station Owner: WDC</td>
<td>Regional</td>
</tr>
<tr>
<td>12</td>
<td>Flour Mill</td>
<td>Private land, access permission required but can be easily viewed from the road as can the quarry</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>13</td>
<td>Valley of the Whales</td>
<td>Private land, access permission required but can be easily viewed from the road</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>National</td>
</tr>
<tr>
<td>14</td>
<td>Anatini</td>
<td>Parking on west of roadside. Please respect this is private property. Public access via marked track</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>15</td>
<td>Elephant Rocks</td>
<td>Parking on east of roadside. Please respect this is private property. Public access via marked track</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>National</td>
</tr>
<tr>
<td>16</td>
<td>Earthquakes</td>
<td>Department of Conservation</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>National</td>
</tr>
<tr>
<td></td>
<td>Location</td>
<td>Access Information</td>
<td>Significance</td>
<td>Grade</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>17</td>
<td>Prydes Gully Road Quarry</td>
<td>Private land, access permission required but can be easily viewed from the road</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>18</td>
<td>Tokarahi Sill</td>
<td>It is too dangerous to stop and view this site, it is best appreciated as you travel past</td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td>19</td>
<td>Huttons Bridge, Otago Schist</td>
<td>Park on roadside shoulder, North West side of bridge. Take great care with traffic at intersection</td>
<td>Owner: WDC</td>
<td>Local</td>
</tr>
<tr>
<td>20</td>
<td>Vanished World</td>
<td>Publically accessible</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>21</td>
<td>Clay Cliffs</td>
<td>Private property with public admission</td>
<td>Waitaki District Plan: Outstanding Natural Landscape QEII Covenant: 5-12-011 ECAN: Outstanding Land of Regional Significance (Mackenzie Basin)</td>
<td>National</td>
</tr>
<tr>
<td>22</td>
<td>Moeraki Boulders and Scenic Reserve</td>
<td>Publically accessible</td>
<td>Waitaki District Plan: Outstanding Natural Feature Reserve: Moeraki Boulders Scenic Gazette 1984 p3971 Owner: Conservation Department</td>
<td>International</td>
</tr>
<tr>
<td>23</td>
<td>Takiroa shelter rock drawings</td>
<td>Publically accessible. Please respect this precious site</td>
<td>Waitaki District Plan: Significant Natural Feature, Archaeological Item 5653 Rock Shelter Heritage NZ: 7769</td>
<td>National</td>
</tr>
<tr>
<td>24</td>
<td>Brewery Hole</td>
<td>Publically accessible</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>25</td>
<td>Mount Charles</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>26</td>
<td>Waitaki River</td>
<td>Publically accessible</td>
<td></td>
<td>International</td>
</tr>
<tr>
<td>27</td>
<td>Mount Royal</td>
<td>Private land, access permission required but can be easily viewed from the road</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>28</td>
<td>Puketapu</td>
<td>Private land. Please respect access provided to summit. Closed during lambing season.</td>
<td>Waitaki District Plan: Significant Natural Feature, Heritage Item Category B</td>
<td>Regional</td>
</tr>
<tr>
<td>29</td>
<td>Goodwood Wetland</td>
<td>Access over private land, permission required</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>30</td>
<td>Pukehiwitahi</td>
<td>Access over private land, permission required</td>
<td>Waitaki District Plan: Significant Natural Feature Statutory: Crown Forest Act 1989</td>
<td>Regional</td>
</tr>
<tr>
<td>31</td>
<td>Devils Bridge Wetland</td>
<td>Private land. Please respect public access provided</td>
<td>Waitaki District Plan: Significant Natural Feature, Area of Natural Significance d QEII Covenant: 5-12-050A Otago Regional Council: Significant Wetland A-Marsh</td>
<td>Regional</td>
</tr>
<tr>
<td>32</td>
<td>Kauru Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>33</td>
<td>Island Cliff</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>34</td>
<td>Fortification Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>No.</td>
<td>Location</td>
<td>Ownership</td>
<td>Location Plan</td>
<td>Significance</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------</td>
<td>----------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>--------------------------------------------------</td>
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<tr>
<td>35</td>
<td>Table Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Outstanding Natural Landscape Statutory: Gazette 2003 p347 ECAN: Outstanding Land of Regional Significance (Mackenzie Basin)</td>
<td>Regional</td>
</tr>
<tr>
<td>36</td>
<td>Cloud Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Outstanding Natural Landscape ECAN: Outstanding Land of Regional Significance (Mackenzie Basin)</td>
<td>Regional</td>
</tr>
<tr>
<td>37</td>
<td>Ohau Moraines</td>
<td>Department of Conservation</td>
<td>Waitaki District Plan: Outstanding Natural Landscape Owner: Conservation Department ECAN: Outstanding Land of Regional Significance (Mackenzie Basin)</td>
<td>Regional</td>
</tr>
<tr>
<td>38</td>
<td>Mount Trotter</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>39</td>
<td>Mount Mackenzie/ Pakhiwiwatahi</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>40</td>
<td>Middle Mount</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>41</td>
<td>Taieri Peak</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>42</td>
<td>Mount Pleasant</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>43</td>
<td>Round Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>44</td>
<td>Sebastopol Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>45</td>
<td>Ahuriri</td>
<td>Department of Conservation</td>
<td>Waitaki District Plan: Outstanding Natural Landscape Statutory: Conservation Purposes Gazette 2004 p3194 Owner: Conservation Department ECAN: Outstanding Land of Regional Significance (Lindis and Ahuriri)</td>
<td>Regional</td>
</tr>
<tr>
<td>46</td>
<td>Earthquakes Escarpment North</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>47</td>
<td>Earthquakes Escarpment South</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
</tr>
<tr>
<td>48</td>
<td>Duntroon Escarpment East</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Outstanding Natural Feature, Archaeological Item 5654, 5655, 5656, 5657, 5658, 5659 Rock Shelter Heritage NZ: 5662 Category 2</td>
<td>Regional</td>
</tr>
<tr>
<td>49</td>
<td>Beach Road</td>
<td>Publically accessible. Please note the road is closed. Parking on reserve to the north</td>
<td>Waitaki District Plan: Significant Coastal Landscape Owner: WDC</td>
<td>Local</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td><strong>Description</strong></td>
<td><strong>Designation</strong></td>
<td><strong>Jurisdiction</strong></td>
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</tr>
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<td>----------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td><strong>Brockmans Hill</strong></td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Teaneraki Cliff</strong></td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Teaneraki Escarpment</strong></td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Waireka Valley Escarpment</strong></td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Canyon Creek</strong></td>
<td>Department of Conservation Glacial stairway</td>
<td>Waitaki District Plan: Outstanding Natural Landscape Statutory: Conservation Purposes Gazette 2004 p3987 Owner: Conservation Department ECAN: Outstanding Land of Regional Significance (Lindis and Ahuriri)</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Lindis Pass fault scarp</strong></td>
<td>Private land, access permission required</td>
<td>Waitaki District Plan: Outstanding Natural Landscape</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Ostler Fault zone, 'The Knot'</strong></td>
<td>Private land, access permission required</td>
<td>ECAN: Outstanding Land of Regional Significance (Mackenzie Basin)</td>
<td>International</td>
<td></td>
</tr>
<tr>
<td><strong>Corbies Creek macrofossils</strong></td>
<td>Private land, access permission required</td>
<td>Waitaki District Plan: Outstanding Natural Landscape</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Hawkdun Cirque</strong></td>
<td>Private land, access permission required</td>
<td>ECAN: Outstanding Land of Regional Significance (Hawkdun and St Marys Ranges / Oteake)</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Wharekuri Fault</strong></td>
<td>Private land, access permission required</td>
<td></td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Campbell Park molluscan fauna</strong></td>
<td>Private land, access permission required</td>
<td></td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Kohurau patterned ground</strong></td>
<td>Department of Conservation</td>
<td>Statutory: Conservation Purposes Gazette 1999 p838 Owner: Conservation Department ECAN: Outstanding Land of Regional Significance (Hawkdun and St Marys Ranges / Oteake)</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Lake Waitaki fossils</strong></td>
<td>Access over private land, permission required</td>
<td></td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Wai O Toura Reserve</strong></td>
<td>Department of Conservation</td>
<td>Reserve: Scenic Public Works Act 1981</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Livingstone Tapui Formation</strong></td>
<td>Private land, access permission required</td>
<td></td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td><strong>Robertson Creek</strong></td>
<td>Department of Conservation</td>
<td>Statutory: Oteake Conservation Park Gazette 2004 p2576 Owner: Conservation Department ECAN: Outstanding Land of Regional Significance (Hawkdun and St Marys Ranges / Oteake)</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td><strong>Rattling Rocks</strong></td>
<td>Publically accessible. Please leave any rattling rocks for someone else to enjoy finding too.</td>
<td>Waitaki District Plan: Designation 186 Main Pumphouse</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>Site Number</td>
<td>Site Name/Feature</td>
<td>Ownership Authority</td>
<td>Access Permission</td>
<td>Statutory Protection</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>---------------------</td>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>67</td>
<td>Green Gully</td>
<td>Department of Conservation</td>
<td>Statutory: Conservation Purposes Gazette 1998 p4352 Owner: Conservation Department ECAN: Outstanding Land of Regional Significance (Hawkdun and St Marys Ranges / Oteake)</td>
<td>Regional</td>
</tr>
<tr>
<td>68</td>
<td>Golden Point Battery</td>
<td>Publically accessible</td>
<td>Reserve: Golden Point Historic Reserve Gazette 1985 p4927 Owner: Conservation Department</td>
<td>Regional</td>
</tr>
<tr>
<td>69</td>
<td>Pigroot Creek reverse fault exposure</td>
<td>Department of Conservation</td>
<td>Private permission required</td>
<td>Regional</td>
</tr>
<tr>
<td>70</td>
<td>Mt Dasher (Otepopo) slate</td>
<td>Private land, access permission required</td>
<td></td>
<td>National</td>
</tr>
<tr>
<td>71</td>
<td>Waianakarua North Branch</td>
<td></td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td>72</td>
<td>Nenthorn Goldfield</td>
<td>Publically accessible</td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td>73</td>
<td>Kokoamu Bluff</td>
<td>Private land, access permission required</td>
<td>Waitaki District Plan: Significant Natural Feature</td>
<td>National</td>
</tr>
<tr>
<td>74</td>
<td>Ardgowan fossils</td>
<td>Private land, access permission required</td>
<td></td>
<td>National</td>
</tr>
<tr>
<td>75</td>
<td>Awamoa Creek fossils</td>
<td>Private land, access permission required</td>
<td>Waitaki District Council: Archaelogical Item 5688 Midden/Ovens</td>
<td>National</td>
</tr>
<tr>
<td>76</td>
<td>Bains Eocene diatomite</td>
<td>Private land, access permission required</td>
<td></td>
<td>International</td>
</tr>
<tr>
<td>77</td>
<td>Bortons Eocene fossils</td>
<td>Private land, access permission required</td>
<td></td>
<td>National</td>
</tr>
<tr>
<td>78</td>
<td>Landon Creek bank</td>
<td>Private land, access permission required</td>
<td></td>
<td>National</td>
</tr>
<tr>
<td>79</td>
<td>Lorne molluscan fossils</td>
<td>Private land, access permission required</td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td>80</td>
<td>Pukeuri Miocene fossils</td>
<td>Private land, access permission required</td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td>82</td>
<td>Totara Brachiopod fauna</td>
<td>Private land, access permission required</td>
<td>Waitaki District Plan: Area of Natural Significance G32</td>
<td>National</td>
</tr>
<tr>
<td>83</td>
<td>Cape Wanbrow Cliff</td>
<td>Publically accessible along beach</td>
<td>Waitaki District Plan: Significant Coastal Landscape Statutory: Conservation Purposes Act 1987</td>
<td>National</td>
</tr>
<tr>
<td>84</td>
<td>Old Rifle Butts</td>
<td>Publically accessible</td>
<td>Waitaki District Plan: Significant Coastal Landscape, Area of Natural Significance G27</td>
<td>National</td>
</tr>
<tr>
<td>85</td>
<td>Weston wind gap</td>
<td>Publically accessible</td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td>86</td>
<td>Jackson's Paddock</td>
<td>Private land, access permission required</td>
<td></td>
<td>International</td>
</tr>
<tr>
<td>87</td>
<td>Oamaru Court House</td>
<td>Publically accessible</td>
<td>Waitaki District Plan: Designation 10 Courthouse, Heritage Item 35 Category A Heritage NZ: 353 Category 1 Statutory: Courthouse Gazette 1986 p2830 Owner: WDC</td>
<td>Regional</td>
</tr>
<tr>
<td>88</td>
<td>Weston pillow lava</td>
<td>Private land, access permission required</td>
<td></td>
<td>Regional</td>
</tr>
<tr>
<td></td>
<td>Location</td>
<td>Access Information</td>
<td>Designation</td>
<td></td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>89</td>
<td>Landon Creek bluff</td>
<td>Private land, access permission required</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alma fossil hardground</td>
<td>State Highway - not safe to stop</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>Fortification Hill</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>Rakis Table</td>
<td>Private land, access permission required. Easily viewed from the surrounding area or via A2O Track</td>
<td>Regional</td>
<td></td>
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<tr>
<td>93</td>
<td>Oamaru limestone dikes</td>
<td>Private land, access permission required. Easily viewed from the surrounding area</td>
<td>Regional</td>
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<td>Waitaki District Plan: Designation 106</td>
<td>Regional</td>
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<td>94</td>
<td>Awahokomo karst pinnacles</td>
<td>Private land, access permission required. Can be viewed from Awahokomo Road</td>
<td>Regional</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>QEII Covenant: 5-12-069</td>
<td>Regional</td>
<td></td>
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<td>95</td>
<td>Bendhu Scientific Reserve</td>
<td>Department of Conservation</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserve: Bendhu Scientific Reserve Gazette 1984 p419 Owner: Conservation Department</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ECAN: Outstanding Land of Regional Significance (Mackenzie Basin)</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>Shag Point Scientific Reserve</td>
<td>Department of Conservation. Scientific Reserve</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waitaki District Plan: Significant Coastal Landscape Reserve: Shag Point Scientific Reserve Gazette 1830 p2665 Owner: Conservation Department</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>Matakaea / Shag Point</td>
<td>Publically accessible</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waitaki District Plan: Area of Natural Significance 93</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Moeraki Peninsula</td>
<td>Publically accessible</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waitaki District Plan: Significant Coastal Landscape, Designation 150 Recreation, Area of Natural Significance G46 Reserve: Recreation Gazette 1985 p1660 Bylaw: Dogs on-lead only, Freedom Camping Prohibited Owner: WDC</td>
<td>Regional</td>
<td></td>
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<tr>
<td>99</td>
<td>Trotters Gorge</td>
<td>Publically accessible</td>
<td>Regional</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>Reserve: Trotter Gorge Scenic Gazette 1979 p2290</td>
<td>Regional</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Dog Pound Quarry</td>
<td>Publically accessible</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bylaw: Freedom Camping Prohibited Owner: WDC</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>Livingstone fossil bug</td>
<td>Private land, access permission required</td>
<td>National</td>
<td></td>
</tr>
</tbody>
</table>
Promotional Materials [2.6]

Vanished World trail guide
3. **Bridge Point** is one of many coastal wetlands of Waitakiri Waita. The volcanoes erupted in shallow seas in Eocene-Miocene times, 35-50 Ma. Volcanic rocks formed hot-shells and stands which quickly eroded away. Vajrans live on in the volcanic debris, in places, abundant dead skeletons accumulated to form the Otago Limestone, this limestone is quarried at Western, near Waitakiri.

7. **Kakanui North Head**. Near the Kakanui River Mouth, dark mineral breccia contains siltstone eroded from the crest of the Central Otago Limestone. Layers formed as fragments slided and flowed away from the vent.笔记本港的溢出物被冲刷。

8. **Coast Road**. A view north from the old Erobera Quarry shows spectacular cliffs of Otago Limestone (32-34 Ma) overlain by Greensand (22-23 Ma). Cape Warawara lies beyond.

9. **Ballantyne’s Harbour Track**. From Lookout Point. Spectacular pillow lavas occur here, at the north end of Cape Warawara.

11. **Enfield**. The craggy outcrop was formed by vertical injection (dykes) of molten basalt into older rocks about 35 Ma. The Pillow Lava and associated lavas (visible 60 m to the southeast) formed about the Palaeocene-Eocene, 55 Ma, before the land was submerged under sea.
A geological map shows how different rocks form our land. On this map, different colours represent different geological ages. Other maps can show rock types: sedimentary, igneous, metamorphic.

WHAT and WHERE?

A geological map helps us understand earth’s materials – resources to use, hazards that threaten, treasures to conserve.

government geologist Alexander McKay was active in the 1870s-1890s. He made important early observations on the geology of the Waitaki region.

Vanished World signage and route guides.
APPENDIX E

Memorandum of Understanding between Te Runaga o Moeraki & Waitaki District Council [3.1]

MEMORANDUM OF UNDERSTANDING

BETWEEN

TE RŪNANGA O MOERAKI

AND

WAITAKI DISTRICT COUNCIL

SIGNED AT

Waitaki District Council

30 November 2016
Memorandum of Understanding

Between

Te Rūnanga o Moeraki and Waitaki District Council

1. Background
Over recent years the Waitaki District Council (Council) and Te Rūnanga o Moeraki (Rūnanga) have worked steadily to improve their relationship. Most of the contact has been made in respect to single issues that have required Council to consult with Mana Whenua (represented by Te Rūnanga O Moeraki) and the Waitaki District Council, wish to maintain an effective relationship. This Memorandum of Understanding (MoU) establishes a clear understanding of this relationship, the principles it is based on and how it can guide and support decision-making of both organisations.

2. Purpose
The purpose of this MoU is to set out mechanisms and processes that will promote and facilitate effective consultation and liaison between the Council and the Rūnanga as one of four Papatipu Rūnanga that represent the Ngai Tahu interests in the Waitaki District Council region (the others being Kāti Huirapa Rūnaka ki Puketeraki, Te Rūnanga o Arowhenua, and Te Rūnanga o Waitao).

3. Principles Guiding the Relationship
   - Partnership – beyond the legislation; genuine desire to consult
   - Mutual respect – acknowledgement of differing world views
   - Trust and Integrity
   - Open Communication
   - Active engagement – proactive and positive, a mutual commitment to respond
   - Acknowledged resource constraints

4. Legislative baselines
Mutual understanding and good will are essential elements of a positive working relationship between Mana Whenua and the Council. However, there are also a number of statutes which provide a framework for Mana Whenua and Council to work together.

Moreover, Te Tiriti o Waitangi (The Treaty of Waitangi) is the founding document of Aotearoa / New Zealand. It provides for the exercise of kawanatanga (governance) by the Crown, while actively protecting tino rangatiratanga, the full authority, status and prestige of Iwi in respect of their possessions and interests, including ngā taonga tuku iho (treasures handed down).

The partnership created between the Crown and Māori under Te Tiriti o Waitangi is significant to all agencies, including territorial authorities, which have Crown-delegated authority to manage ngā taonga tuku iho. The Council / Mana Whenua relationship is recognised in some legislation and extends across a wide range of activities and resources.

The Waitaki District Council is a Local Authority constituted by the Local Government (Waitaki District) Reorganisation Order 1999, and subsequent amendments. The Local Government Act 2002 emphasises the importance of Councils’ relationship with Iwi. The Act requires councils to be more active in facilitating Iwi involvement in local authority decision-making.
Since 1991, the Resource Management Act has been central to Council / iwi relations. The Act recognises the special status of Mana Whenua as separate and distinct from other interest groups and requires that councils take into account iwi concerns. When required and consistent with the Protocol that exists between the Council and KTKO Ltd (Kai Tahu ki Otago), the Council will require applicants for resource consent to consult with KTKO Ltd, who will facilitate on behalf of Te Rūnanga o Moeraki.

Te Rūnanga o Ngāi Tahu is the tribal representative body of Ngāi Tahu Whānui, a body corporate established 24 April 1995 under section 5 of the Te Rūnanga o Ngāi Tahu Act 1995 (the TRoNT Act). Section 5 of the TRoNT Act describes the takīwā (area) of Ngāi Tahu Whānui, which includes the entire area of the Waitaki District Council. In the context of this agreement the term “ngā Rūnanga” means the signatories to this document other than the Waitaki District Council.

Section 15 (1) of the TRoNT Act prescribes that “Te Rūnanga o Ngāi Tahu shall be recognised for all purposes as the representative of Ngāi Tahu Whānui”.

Section 15 (2) of the TRoNT Act prescribes that “Where any enactment requires consultation with any iwi or with any iwi authority, that consultation shall, with respect to matters affecting Ngāi Tahu Whānui, be held with Te Rūnanga o Ngāi Tahu”.

Section 15 (3) of the TRoNT Act prescribes that “Te Rūnanga o Ngāi Tahu, in carrying out consultation under subsection (2) of this section,

a) Shall seek the views of each Papatū Rūnanga of Ngāi Tahu Whānui and such hapu as in the opinion of Te Rūnanga o Ngāi Tahu may have views that they wish to express in relation to the matter about which Te Rūnanga o Ngāi Tahu is being consulted, and

b) Shall have a regard, among other things, to any views obtained by Te Rūnanga o Ngāi Tahu under paragraph (a) of this subsection; and

c) Shall not act or agree to act in a manner that prejudices or discriminates against any Papatū Rūnanga of Ngāi Tahu or any hapu unless Te Rūnanga o Ngāi Tahu believes on reasonable grounds that the best interests of Ngāi Tahu Whānui as a whole require Te Rūnanga o Ngāi Tahu to act in that manner”.

It is the acknowledged practice of Te Rūnanga o Ngāi Tahu that consultation in the first instance is with Papatū Rūnanga. In the Waitaki District it is recognised that there are four Papatū Rūnanga with whom consultation should occur. These are: Te Rūnanga o Moeraki, Kāti Hulapa Rūnaka ki Puketeraki, Te Rūnanga o Arowherua, and Te Rūnanga o Waihao.

Any implementation of tikanga or kawa within the Council or association with any Council supported / managed event will occur only with the authority and support of the appropriate Rūnanga. For the area north of the Waihemo River Te Rūnanga o Moeraki is the appropriate Rūnanga.

5. Implementation of the MoU
This MoU will only be effective if it is supported by a practical approach to implementation, and the following are some day-to-day operational issues that have been identified:

5.1 When to Consult
- An annual meeting calendar consisting of an overview without detail will be provided at the start of the year to Mana Whenua by Council.
• Both parties will meet on an annual basis to discuss possible Annual Plan projects that may be funded in part or in whole by Council or from alternative funding sources (eg national, regional or local grants).

• Activities outside of the annual planning cycle are, where appropriate and possible, to be advised a pre-draft stage and will be provided to Mana Whenua by the Community Services Group Manager.

• Any unforeseen issues that Mana Whenua may have an interest in shall be notified to them by Council as soon as possible.

• For key issues for consultation, including natural resources, resource consents, plan changes, Council staff are to direct their inquiries in the first instance to KTKO Ltd who facilitates on behalf of Te Rūnanga o Moeraki.

• Other key issues for consultation include education, health, social services and issues associated with cultural interpretation, tourism, economic development, and regional development. Mana Whenua are to be given the opportunity to decide if they have input into other issues. Both Council staff and Mana Whenua are to be responsible for identifying matters for consultation. Where Council staff are unsure they should seek further information from Mana Whenua.

• Council staff may be provided with training, as necessary, to create an awareness of the issues Mana Whenua might want to be consulted on.

5.2 Governance / Management

• Mana Whenua representation on council working parties will be decided on a case by case basis.

• Council’s Community Boards may consult with Mana Whenua on local issues of particular interest and invite them to their meetings to address the issue.

• Six-monthly meetings may be held between the chairperson of the Rūnanga and the Mayor. Both Mana Whenua and Council are to ensure these meetings happen.

• Representatives of the Rūnanga may meet with the Chief Executive Officer of the Council on a specific issue basis.

• Appropriate training needs for Council staff will be identified in consultation with Mana Whenua and training strategies to meet these needs will be mutually agreed between Mana Whenua and the Council.

• Council reports are to capture Mana Whenua concerns and input identified. This will be reviewed annually and reported back to Mana Whenua at a combined Council and Rūnanga hui. The hui date is to be set by Mana Whenua in consultation with Council, with the hui being held alternately at Moeraki and Oamaru.

• Where appropriate Council staff may provide support to Mana Whenua to enable them to contribute to consultation processes.
5.3 Communication
- The consultation process will commence through the above regular meetings with staff providing written advice of specific issues and as much notice as possible.
- Elected members / Mana Whenua are to meet annually alternatively between Moeraki Marae and the Council office in Damaru, with the Council reporting on how Mana Whenua concerns had impacted on their decisions made over the past year and the resulting activities.
- Contact people at the Rūnanga are:
  Office Manager: moeraki.runanga@xtra.co.nz
- Contact people at the Council are:
  Mayor: gkircher@waitaki.govt.nz
  CEO: mross@waitaki.govt.nz
  Community Services GM: bcloete@waitaki.govt.nz
- Contact people for KTKO Ltd: Chris@kiko ltd.co.nz

5.4 Settlement of Differences
Three steps have been identified to deal with settlement of differences:
1. For governance issues, the Mayor and / or elected members will meet with Mana Whenua to resolve the matter.
2. For operational matters, the parties will discuss the issue(s) in a working group forum, until a resolution has been reached. Genuine efforts will be made by all involved to build a workable resolution to address all concerns. Where a resolution is not possible, the party who has primary ownership of the issue will make the final decision.
3. For matters concerning iwi only, such as tikaka / kawa – these issues will be addressed by Mana Whenua only, usually on the Marae.

5.5 Budget
- Consultation between Council and Mana Whenua will occur within the annual planning cycle identified previously. The level and context of the consultation will be negotiated as appropriate to the circumstances and mutual agreement.
- Travel cost and other expenses will be paid at normal Council rates in accordance with Council’s meeting policy.

5.6 Attendance at Meetings
- Council will attend Rūnanga meetings on an issue by issue basis or as required by either party and will give due notice prior to attending.
- Mana Whenua have the opportunity to speak at the start of full Council meetings and are encouraged to make use of these opportunities.
- The Chairperson of the Rūnanga will be the representative authority, however on occasions other representatives of the Rūnanga will be appointed for specific purposes. These people who fill these roles will be identified and notified to Council.

6. Review of Relationship Agreement
This MoU will be reviewed in April 2018, then three yearly or by mutual agreement.

The MoU may be amended or expanded by mutual agreement at any time.
7. Signatories to the Relationship Agreement

We, who have signed below on behalf of the parties to this Memorandum of Understanding, will support and develop the MoU according to agreed principles, for the benefit of current and future generations of the Waitaki District.

Name: David Piggott

Signature: [Signature]

For Te Rūnanga o Moeraki

Name: Emily May McQueen Kirwan

Signature: [Signature]

For Waitaki District Council

Dated: 30/11/16
APPENDIX F
Deed of Trust of the Waitaki Whitestone Geopark Trust (Draft) [3.2]

DEED OF TRUST OF THE WAITAKI WHITESTONE GEOARK TRUST
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THIS DEED is made this day the 29th April 2018.

PARTIES

(1) Waitaki District Council ("the Settlor")

(2) ___________________________________ ("the Trustees")

BACKGROUND

A The Trustees have a vision to establish a Waitaki Whitestone Geopark Trust in line with the principles espoused by the UNESCO Global Geopark Network.

B The Trustees wish to establish a charitable Trust in New Zealand ("the Trust") to give effect to the charitable purposes referred to in this Deed.

C The persons comprising the Trustees have agreed to enter into this Deed specifying the purposes of the Trust and providing for its control and government.

D By way of initial gift to the Trustees to establish the Trust, the Settlor has paid the sum of $10.00 to the Trustees on the date of execution of this Deed.

THIS DEED WITNESSES

1. Interpretation
   1.1 Definitions
   In this Deed, unless the context requires otherwise:

   'Advisory Trustees' mean a person appointed to assist the Board pursuant to clause 5.6;

   'Board' means the Board of Trustees of the Trust constituted in accordance with the Deed;

   'Charitable Purpose' means and includes that term as defined by the Charities Act 2005 and also means and includes every charitable purpose (whether religious, educational or otherwise) within New Zealand and which shall be regarded as charitable by the law for the time being in New Zealand, provided that any such charitable purpose shall also be regarded as charitable under any law of New Zealand relating to income tax for the time being in force in New Zealand;

   'Deed' means this Deed of Trust as altered from time to time in accordance with Clause 15 or as amended in any other manner permitted by law;

   'Designated gift' means a gift which is subject to a Trust for a specific purpose that comes within the purposes of the Trust Fund;

   'Financial Year' means the year ending 30 June or any other date adopted by the Trustees as the date up to which accounts shall be made in each year for the Trust;
'Investment Manager' means a person whose profession or business is or includes investing money on behalf of others;

'Net Income' means in relation to the Trust Fund:

(a) All income from dividends, rents, interest or otherwise from time to time derived by the Trust Fund; and
(b) All income derived from any other activities as and when the same shall be received and finally determines for each Financial Year.

'Trust' means The Waitaki Whitestone Geopark Trust as constituted by this Deed;

'Trustee' means the Trustees for the time being of the Trust whether original additional or substituted;

'Trust Fund' means:

(a) The initial sum of $10.00 referred to in clause D above and all other monies, investments and property, both real and personal, which may be received and accepted by the Trustees as part of the Trust Fund from time to time; and
(b) The investments and properties from time to time representing the above and accretions to and income from those investments and properties.

1.2 Construction

In the construction of this Deed, unless the context requires otherwise:

(a) References to clauses are to clauses of this Deed.
(b) A reference to a person includes references to individuals, companies, corporations, partnerships, firms, joint ventures, associations, Trusts, organisations, governmental or other regulatory bodies or authorities or other entities in each case whether or not having separate legal personality.
(c) A reference to an enactment or any statutory provisions includes that enactment or statutory provision which amends or replaces it and any subordinate legislation made under it.
(d) Headings appear as a matter of convenience and shall not affect the construction of this Deed.
(e) Any reference to a 'law' includes common or customary law and any constitution, decree, judgement, legislation, order, ordinance, regulation, status, treaty or other legislative measure, in each case of any relevant jurisdiction (and 'lawful' and 'unlawful' shall be construed accordingly).
(f) The words and expressions defined are indicated by capital letters for convenience. The absence of a capital letter shall not alone imply that the word or expression is used with a meaning different from that given by its definition.
(g) Words importing the plural include the singular and vice versa and words importing gender import all genders.
2. Creation of the Trust

2.1 Declaration of Trust

The Trustees acknowledge and declare that they shall hold the Trust Fund upon Trust to apply the same for the objects and purposes and with the powers and discretions set out or implied in this Deed.

2.2 Te Ingoa/Name

The Trust created by this Deed will to be known as the “Waitaki Whitestone Geopark Trust” or by such other name as the Trustees may determine by resolution from time to time.

3. Whanga/ Purposes

The Trustees shall hold the Trust Fund upon Trust to pay or apply in New Zealand the income and the capital of the Trust Fund in such amounts, at such times, and subject to such terms and conditions, as the Trustees may decide towards the establishment, maintenance, promotion and functioning of The Waitaki Whitestone Geopark Trust through any of the following objects and purposes (but only to the extent that they are recognised as charitable purposes by the Commissioner Inland Revenue).

3.1 Purposes

The purposes of the Trust are to:

(a) preserve geological heritage within The Waitaki Whitestone Geopark Trust for present and future generations

(b) inform the public about issues in the geological sciences and their relationship to the environment

(c) encourage and monitor sustainable development within the local community

(d) foster multi-cultural bridges for heritage and conservation and the maintenance of geological and cultural diversity

(e) stimulate research

(f) promotion of education in relation to the geosciences

(g) contribute actively within the UNESCO Global Geoparks Network through joint initiatives (e.g. communication, publications, exchange of information, participation in meetings, and common projects)

(h) contribute local articles to the UNESCO Global Geoparks Network Newsletters, books and other publications

(i) contribute to and actively participate in International Geoparks Conferences as recommended by the Global Geoparks Network, with the support of UNESCO.

(j) Follow the principles of the UNESCO Geopark Network and such amendments, additions and/or variations as may be determined from time to time.
By way of illustration only, and not by way of limitation of the Trust's general purpose set out in clause 3, the Trust may:

- Implement projects to mobilise and coordinate bottom up and top down initiatives for the promotion, protection, maintenance and growth of The Waitaki Whitestone Geopark Trust;
- Fund raise and seek resources to be made available to the Trust and its projects;
- Distribute funds and enter into arrangements, contracts and other agreements, on such terms and conditions that the Trustees deem suitable, for the purpose of furthering the objects and purposes of the Trust;
- Carry out such other lawful activities which are incidental or conducive to attaining the objects and purposes of the Trust;
- Coordinate and network with (not duplicate) existing geoscience, conservation and biodiversity projects;
- Share information and raise awareness within the community;
- Support developments and use of effective technological advances in geoscience and geopark education;
- Support research that contributes to the preservation and protection of fossils;
- Provided that the foregoing activities are to be conducted only in furtherance of Charitable Purposes and are not to be construed as to authorise the pursuit of any non-charitable purpose.

3.2 Limit to Charitable Purpose

Notwithstanding anything to the contrary expressed in or implied by this Deed, the objects and purposes for which the Trust is established and the activities for which the Trust Fund may be applied, are limited to Charitable Purposes according to the laws of New Zealand as interpreted by the courts of New Zealand.

3.3 Change in Law

If, because of any change in the law brought about by the enactment of new legislation and/or the amendment or repeal of existing legislation, or by any change in the official interpretation or official application of any such legislation, it is at any time necessary to amend the terms of this Deed in order to achieve and/or preserve the availability of any concession in relation to the Trust under any of the Concessionary Provisions, which would otherwise be available were it not for the change in the law, then, despite clause 14, the terms of this Deed will at that time be deemed to be amended to the extent necessary.

4. Takata Whenua

In attaining its purposes the Trust shall recognise the views and expectations of takata whenua.
5. Te Runanga Whahahaere/Board

5.1 Administration by Board

The Trust shall be administered by a Board comprising the Trustees.

5.2 Name of the Board

The name of the Board shall be The Waitaki Whitestone Geopark Trust Board.

5.3 Numbers

The Board ("the Board") shall consist of not less than three (3) nor more than seven (7) members. The initial members of the Board shall be the signatories to this Deed.

5.4 Term of Board

Unless otherwise specified in this Deed each member of the Board shall hold office for a term of three years, or until she or he dies, or is declared bankrupt, is imprisoned or shall have his or her property affairs managed under the Protection of Personal and Property Rights Act 1988 upon the grounds of lack competency to manage those affairs, or is a "patient" as defined in S2 of the Mental Health (Compulsory Assessment and Treatment) Act 1992, or gives one month’s notice of resignation in writing to the remaining members of the Board. Any retiring member shall be eligible for re-appointment.

5.5 Appointment of new Trustees

The power of appointment of Trustees shall be exercised in the following manner:

(a) The Waitaki District Council shall have the right to appoint two (2) Trustees and the power to alter those appointments from time to time PROVIDED that at least one (1) of those Trustees appointed by Waitaki District Council must be an elected person. Every appointment and revocation of appointment shall be in writing and provided to the then chair of the Trust.

(b) Subject to clause 5.5(a), the power of appointment of all other new and additional Trustees shall be vested in the Trustees.

(c) The power of appointment of all other new and additional Trustees shall be by a resolution passed by a two-third majority of all of the Trustees;

(d) If at the time there is no Trustee with the capability, availability or willingness to exercise that power, then that power shall be vested in the person in whom such power is vested by the Trustee Act 1956.

5.6 Appointment of Advisory Trustees

(a) The Board shall, at all times, have the power to co-opt or appoint any person or persons to act as an Advisory Trustee. Any person co-opted or appointed under this clause does not hold the office of a Trustee and shall not have the rights and powers of a Trustee. For the avoidance of doubt no Advisory Trustee is entitled to vote on any decision of the Board.

(b) The appointment and removal of Advisory Trustees shall be exercised by way of ordinary resolution of the Board. Each such appointment and/or removal shall take effect from the time specified in such ordinary resolution.
5.7 Termination of Trusteeship

The Board may, by a motion decided by a two-thirds majority of votes, terminate a member's membership of the Board if it believes that such action is in the best interest of the Trust.

5.8 Duties

The Board will be responsible for furthering the objects of the Trust and for declaring general policy relating to the implementation of the objects of the Trust.

5.9 Officers

The officers of the Board shall consist of the following:

(a) The Chairperson who shall be a Trustee and who shall be appointed by the Board. The Chairperson will retire from that office at each Annual Meeting and shall be eligible for reappointment by the Board at that Annual Meeting; and

(b) The secretary, or such officers, as may be determined by the Board from time to time.

5.10 Role of Chairperson

The role and powers of the Chairperson of the Board shall include:

(a) Chairing meetings of the Trustees; and

(b) Such other functions as are allocated to the Chairperson in this Deed.

5.11 Treasurer

The Trustees may from time to time appoint a treasurer on such terms as they think fit. The treasurer shall keep usual and proper books of account and report to the Trustees from time to time on the finances of the Trust and present annual statements of account for audit and consideration by the Trustees.

5.12 Financial statements and audit

The Board shall cause proper books of account to be kept showing all assets and liabilities of the Trust Fund and all moneys received and disbursed. The Board shall prepare annual financial statements and to the extent required by law, or as decided by the Board such accounts shall be audited or independently reviewed by a suitably qualified person appointed for that purpose by the Board.

6. Taketake/Powers of the Trustees

6.1 Achieving of purposes

The Trustees may, in order to achieve the objects and purposes of the Trust, in addition to all other powers vested in the Trustees:

(a) Apply for, obtain, enter into and/or hold or give any agreements, licences, easements, consents, covenants or other interests in land or under contract or any other regulatory or statutory authorisation of any kind whatsoever necessary to give effect to the purposes of the Trust;
(b) Seek, accept and receive subscriptions, donations, subsidies, grants, endowments, gifts, legacies, loan and bequests in money, in kind or otherwise;

(c) Make, grant or give donations, subsidies, grants or gifts in money, in kind or otherwise to any other person, organisation or group (whether incorporated or not) sharing similar charitable objects to the Trust;

(d) Establish, promote and foster any other person, organisation or group (whether incorporated or not) with similar charitable objects to the Trust;

(e) Establish, promote, and foster community programmes, workshops, public classes and other activities;

(f) Make known and advertise the Trust and its purposes by such use of the media as the Trustees may decide;

(g) Develop affiliations or achieve accreditation with any other person, organisation or group (whether incorporated or not) sharing similar charitable objects to the Trust;

(h) Subsidise, encourage, and co-operate with any other person, organisation or group (whether incorporated or not) sharing similar charitable objects to the Trust;

(i) Make any loan or provide any other financial accommodation (with or without security) for any of the objects and purposes of the Trust and on such terms and conditions as the Board think fit including, without limitation, the giving of a guarantee (supporting security over any asset of the Trust Fund) in favour of the obligations of any person; and

(j) Undertake such other activities and enterprises and do such acts, matters and things to further the charitable purpose of the Trust as the Trustees may decide.

6.2 General and specific powers of Trustees

It is intended that in the exercise of their discretion the Trustees shall have the fullest possible powers in relation to the Trust Fund, and that they may do anything they think necessary, expedient or desirable even though it is something which they would not normally have power to do in the absence of an express power or an order of the Court. In addition to the powers implied by the general law of New Zealand or contained in the Trustee Act 1956, the powers which the Board may exercise in order to carry out its charitable purposes include:

(a) To use the fund of the Trust as the Board thinks necessary or proper in payment of the costs and expenses of the Trust, including the employment of professional advisers, agents, Officers and staff as appears necessary or expedient;

(b) To purchase, take on lease or in exchange or hire or otherwise acquire any land or personal property and any rights or privileges which the Board thinks necessary or expedient for the purpose of attaining the objects of the Trust and to sell, exchange, bail or lease, with or without option of purchase, or in any manner dispose of any such property, rights or privileges as aforesaid;

(c) To carry on any business;

(d) To invest surplus funds in any way permitted by law for the investment of Trust funds and upon such terms as the Board thinks fit;

(e) To borrow or raise money from time to time, with or without security, and upon such terms as to priority and otherwise as the Board thinks fit; and
(f) To do all things as may from time to time be necessary or desirable to enable the Board to give effect to and to attain the charitable purposes of the Trust.

However:

(g) This power does not authorise the Trustees to do anything which may prejudice the charitable nature of the purposes of the Trust; and

(h) All the Trustees’ powers, authorities and discretions shall be subject to any direction to the contrary in any instrument evidencing or conferring a gift accepted by the Trustees, whether the gift is a Designated Gift or is generally for the purposes of the Trust Fund.

6.3 Incorporation

The Board is empowered to seek incorporation in accordance with the provisions of the Charitable Trusts Act 1957.

(a) Registered Office Address:
   c/- Waitaki District Council
   20 Thames Street
   Oamaru 9400
   Otago
   New Zealand
   Attention: Chair of The Waitaki Whitestone Geopark Trust

(b) Common Seal: The Board shall have a common seal which shall be kept in the custody of the secretary, or such other officer as shall be appointed by the Board, and shall be used only as directed by the Board. It shall be affixed to documents only in the presence of, and accompanied by the signature of, two members of the Board.

(c) Execution of Documents: Contracts may be entered into on behalf of the Board as follows:
   
   i. a contract which if made between private persons would be by law required to be by Deed may be made on behalf of the Board in writing signed by any person acting under its authority, express or implied or, if required by law, under the common seal. Every affixing of the common seal shall be accompanied by the signatures of two Trustees, which signatures shall be sufficient evidence of the authority to affix such seal and no person dealing with the Trustees shall be bound or concerned to see or enquire as to the authority under which any document is sealed and in whose presence.

   ii. A contract which if made between private persons would only be by law required to be in writing, signed by the parties, may be made on behalf of the Board in writing signed by any person acting under its authority, express or implied.

6.4 Employment

Under clause 6.2(a) the Board may employ as agents, officers, and staff, persons who are members of the Board.
Administration of Trust Fund

7.1 Income

(a) The Trustees are not obliged to pay the whole of the income of the Trust Fund in any year but may accumulate any monies not paid. The Trustees may at any time resort to any accumulations and pay them as if they were income earned in that year.

(b) In each year, the Board shall hold the Net Income of the Trust Fund to determine what part or parts (if any) of the Net Income of the Trust Fund should be capitalised and applied as an accretion to the capital of the Trust Fund and what part (if any) should be distributable income and to pay and apply the amounts so determined accordingly. (For the purposes of this clause 'distributable income' shall mean the balance of the Net income of the Trust Fund after the determination and allocations referred to above).

(c) any distributable income shall be paid or applied in or towards any of such objects and purposes of the Trust as the Board may in its absolute and unfettered discretion deem necessary.

(d) The Board may from time to time in its discretion solicit applications be advertisement or by any other means as it may determine to receive from the Trust Fund a distribution from the residue of the distributable income, whether by way of scholarship or otherwise. Any application shall be addressed to the Board and shall be in writing in a form approved by the Board. Scholarships and funding grants shall only be made in favour of persons, groups or organisations who can assist the Trust in carrying out its purposes.

(e) Notwithstanding the above provisions, nothing shall require or compel the Board to make any payments, allocation or distribution of the whole or any part of the Net Income of the Trust Fund at any particular time during the Financial Year.

(f) Distributions and allocations of income under the provisions of this clause may be in such form as the Board determines whether in cash or by transfer in Specie.

7.2 Scheme for Income distribution

For the purposes of applying the Net Income of the Trust Fund the Board shall have full and unfettered power to adopt and apply any scheme or schemes for the distribution of the Net Income of the Trust Fund and may make such rules and regulations in connection therewith as it may think proper and such rules and regulations shall be binding on the beneficiaries affected thereby and the Board may from time to time revoke, amend or later such scheme, rules and regulations and formulate another or others.

7.3 Property

When property is accepted or acquired by the Trustees for any or all of the general objects and purposes of the Trust, the Trustees may apply income from such property in or towards any of such objects and purposes as they may in their absolute and unfettered discretion deem necessary or they may accumulate such
income until the same can in their opinion be usefully applied for all or any such purposes in accordance with Clause 7.1.

7.4 Investment powers

The Trustees have in the administration, management and investments of the Trust Fund all the rights, powers and privileges of a natural person. Subject to the terms of this Deed they may deal with the Trust Fund as if the Trustees were the absolute owners of the Trust Fund. While all property forming part of the Trust Fund and available for investment shall be invested in accordance with the provisions of the Trustee Act 1956 as the investment of Trust Funds, in exercising their powers of investment the Trustees may acquire any property or retain or deal with any property which from time to time comprises the whole or part of the Trust Fund notwithstanding that this would be, or could be, contrary to the principles governing the investment of Trust Funds in the Trustee Act 1956. This clause expresses a "contrary intention" for the purposes of section 13D of that Act.

7.5 Standard of care of investment

Notwithstanding the foregoing and anything to the contrary in section 13D(1) of the Trustee Act 1956, the Trustees shall in exercising the powers of investment, exercise the care, diligence and skill required by section 13B or section 13C of the Trustee Act 1956 as applicable.

8 Income, benefit or advantage to be applied to charitable purposes

8.1 Application

Any income, benefit or advantage shall be applied to the charitable purposes of the Trust.

8.2 Influence

No member of the Trust or person associated with a member of the Trust shall participate in, or materially influence, any decision made by the Trust in respect of the payment to or on behalf of that member or associated person of any income, benefit or advantage whatsoever.

8.3 Professional account and influence

A person who in the course of and as part of the carrying on of his or her business of a professional public practice shall not, by reason only of his or her rendering professional services to the Trust or to any company by which any business on the Trust is carried on, be in breach of the terms of clause 8.5

8.4 Entrenchment

The provisions and effect of this clause shall not be removed from this document and shall be included and implied into any documents replacing this document.

8.5 No private pecuniary profit of any individual and exceptions

No private pecuniary profit shall be made by any person involved in this Trust. Except that:
(a) any Trustee may receive full reimbursement for all expenses which he or she properly incurs in connection with the affairs of the Trust;
(b) the Trust may pay reasonable and proper remunerations to any officer or servant of the Trust (whether a Trustee or not) in return for services actually rendered to the Trust;
(c) any Trustee may be paid all usual professional, business or trade charges for services rendered, time expended and all acts done by that Trustee or by any firm or entity of which that Trustee or by any firm or entity of which that Trustee is a member, employee or associate, in connection with the affairs of the Trust.
(d) Any such remuneration or payment pursuant to clauses 8.5(b) and 8.5(c) of the Trust Deed shall be upon a normal arm's length commercial basis, having regard to the prevailing market value. Payment must be authorised by the other Trustees and certified by the Trustees as being fair and reasonable.
(e) Any Trustee may retain any remuneration properly payable to that Trustee by any company or undertaking with which the Trust may be in any way concerned or involved for which that person has acted in any capacity whatever, notwithstanding that that Trustee’s connection with that company or undertaking is in any way attributable to that Trustee’s connection with the Trust.
(f) The Trustees, in determining all reimbursements, remuneration and charges payable in terms of this clause, shall ensure that:
   (i) All reimbursements, remuneration and charges are agreed to by the Trustees; and
   (ii) The restrictions imposed by this clause, and the remainder of clause 8, are strictly observed.

9 Responsibility of Trustees

9.1 Liability of Trustees

A Trustee shall be liable only for any loss attributable to his or her dishonesty or to his or her wilful commission or omission of an act which he or she knows to be a breach of Trust.

9.2 Indemnity

Any Trustee, officer or employee of the Trust shall be indemnified out of the assets of the Trust against any personal liability incurred in respect of the exercise or attempted exercise of the Trusts, powers and discretions vested in the Trustees pursuant to this Deed and in respect of any matter or thing done or omitted to be done in any way relating to the Trust (provided such liability is not attributable to his or her own dishonesty or to the wilful commission or omission by him or her of an act known by him or her to be a breach of Trust), and shall have a lien on and may use any moneys for the time being in the hands or coming into the hands of the Trustees for the above indemnity and also for the payment of all proper legal and other costs, taxes, charges, and expenses of administering or winding up the Trust which may be permitted from time to time in terms of this Deed.
9.3 Trustees’ Liability Insurance

(a) The Trustees, in respect of one or more of the Trustees, may take out Trustees’ liability insurance for such cover and on such terms as the Trustees think fit.

(b) The reasonable cost of premiums is to be treated as a legitimate expense of the Trust, and may be paid directly from the Trust Fund.

10 Nga Hui O Te Runanga Whakahaere/Proceedings of the Board

10.1 Meetings

The Board shall meet at such times and places as it determines, and shall be regulated in accordance with the provisions contained in the Schedule. The Board shall elect a chairperson from amongst its members at its first meeting and at every subsequent annual general meeting.

10.2 Chairperson

The chairperson shall preside at all meetings of the Board at which she or he is present. In the absence of the chairperson from any meeting, the members present shall appoint one of their number to preside at the meeting.

10.3 Quorum

At any meeting of the Board a majority of members shall form a quorum and no business shall be transacted unless a quorum is present.

10.4 Voting

Unless otherwise provided in the Deed, all questions before the Board shall be decided by a majority of votes. Each Trustee shall have one vote. If the voting is tied, the motion shall be lost. The chair shall have a casting vote as well as a deliberative vote.

10.5 Executive Director

(a) The Trustees may appoint a person to the office of Executive Director for such period and on such terms as the Trustees see fit, and subject to the terms or any agreement entered into in any particular case, may revoke any such appointment.

(b) The Executive Director will oversee the day to day operations and management of the Trust, subject to the ultimate direction and control of the Trustees. The Trustees may delegate to the Executive Director with any conditions, limitations and restrictions they consider necessary, any of the powers that they are able to delegate under this Deed, and may at any time withdraw, revoke or vary the powers so delegated.

11 Power to delegate

11.1 Power to delegate

The Board may, from time to time, delegate any of its powers and duties to any such attorney, agent or person, and the attorney, agent or person, as the case may be, may without confirmation by the Board exercise or perform the delegated powers or
duties in like manner and with the same effect as the Board could itself have exercised or performed them.

11.2 Delegate bound

Any attorney, agent or person to whom the Board has delegated powers or duties shall be bound by the charitable terms of the Trust.

11.3 Delegation revocable

Every such delegation shall be revocable at will, and no such delegation shall prevent the exercise of any power or the performance of any duty by the Board.

11.4 Delegate need not be Trustee

It shall not be necessary that any person who is appointed, or to whom any such delegation is made, be a member of the Board.

11.5 Specific Powers

Without prejudice to the powers conferred upon the Board by law or by clause 6, the Board may:

(a) Investment Manager: Appoint or remove one or more Investment Managers on terms to be agreed between the Board and the Investment Manager from time to time. The Investment Manager may be given such powers and duties in relation to the investments in accordance with the provisions of Clause 7 as decided by the Board.

(b) Custodian Trustee: Appoint and remove from office a custodian Trustee in respect of the whole or any part of the assets of the Trust on such terms and with such duties, powers and discretions as may be agreed between the Board and custodian Trustee from time to time.

12 Committees

12.1 Power to convene committees

The Board will have the power to appoint the convener and members of such committees as the Board shall from time to time deem advisable and may delegate and assign to such committees such particular duties and responsibilities as the Board shall think fit.

12.2 Proceedings of committees

Committee members may meet together for the dispatch of business, and adjourn or otherwise regulate their meetings as they think fit to carry out their functions.

12.3 Budgets

Committees will not expend any moneys or incur any liabilities in excess of any budget approved by the Board without the prior approval of the Board.

12.4 Power of appointment of committee members

The Board will have the power to fill any casual vacancies on a committee or make any further appointments to a committee from time to time.
12.5 Reporting

Each committee will prepare and provide such reports to the Board as directed by that Board.

13 Supporters

The Rules set out in Schedule 2 (with any valid alterations) govern the admission, classification, rights and entitlements of the Supporters of the Trust.

14 Alteration of Deed

The Board may, from time to time by resolution carried by a majority of their number at that time modify, alter or amend any terms of this Deed with such modification, alteration or amendment to be recorded by supplemented deed, provided that no such alteration, modification or addition shall:

(a) Detract from the exclusively charitable nature of the Trust or result in the distribution of its assets on winding up or dissolution for any purpose that is not exclusively charitable; or

(b) Be made to clauses 3, 8, 14, 15 or 16 unless it is first approved in writing by the Department of Inland Revenue and/or the Charities Commission (if required).

15 Voluntary Winding up

The Trust may be wound up at any time on passing of a unanimous resolution of the Trustees provided that:

(a) That resolution must be passed at a Trustee's meeting called for that purpose; and

(b) The Trustees must be given no less than 30 days notice of such a meeting.

16 Disposition of surplus assets

If, either on the winding up, failure or dissolution of the Trust, or in the case of the Board having incorporated in accordance with the provisions of the Charitable Trusts Act 1957 (or other act passed in substitution for the same) on the liquidation of the Board or on its dissolution by the Registrar, there remains, after payment of all of the Trust debts and liabilities, any property and/or assets whatsoever, they shall be given or transferred to the North Otago Museum however in the event that it is no longer in existence, then the remaining property and/or assets shall be given to the Trustees of any such organisation, charity or other entity carrying out charitable purposes within New Zealand similar to those charitable purposes set out in this Deed, or be applied for such charitable purposes within New Zealand as the Board may, by resolution, determine at, before, or during the winding up, failure, dissolution or liquidation. If the Board is unable to make such decision, such property shall be disposed of in accordance with the directions of a Judge of the High Court pursuant to section 27 of the Charitable Trusts Act 1957 on the application of any member of the Board.
17 Execution

This Deed may be executed in any number of counterparts each of which will be deemed an original, but all of which together will constitute one and the same instrument. A party may enter into this Deed by signing any counterpart.

IN WITNESS this Deed is duly executed.

SIGNED by )
Name )
as Trustee )

In the presence of: )
Witness Signature )
Witness Name )
Address )
Occupation )

SIGNED by )
Name )
as Trustee )

In the presence of: )
Witness Signature )
Witness Name )
Address )
Occupation )
Schedule 1 Procedural rule of the Board

1 Ordinary meetings
The Trustees shall meet as often as they consider desirable for the efficient and proper conduct of the affairs of the Trust, but in any event at least once in each Income Year.

2 Special meetings
A special meeting may be called at any time by two or more Trustees.

3 Notice of meetings
3.1 Written notice of every ordinary or special meeting shall be hand-delivered, posted or sent by email or facsimile to each Trustee at least 2 weeks before the date of the meeting. The secretary or some other person acting under the direction of the Trustees or, in the case of a special meeting, acting under the direction of those Trustees calling the meeting, shall give the notice of the meeting. No notice shall be required for adjourned meetings except to those Trustees who were not present when the meeting was adjourned.

3.2 Every notice of a meeting shall state the place, day and time of the meeting, and in the case of a notice of a special meeting, shall also state the subject-matter of the meeting.

3.3 The requirement for notice of a meeting may be waived if all of those Trustees who are for the time being in New Zealand give their written consent to such waiver.

4 Chair
The Trustees shall elect a chair of their meetings. The chair shall take the chair at all the meetings of the Trustees and shall have a casting as well as a deliberative vote. If the chair cannot be present, or is not present within 10 minutes of the time appointed for any meeting, the Trustees present shall elect one of their number to be chair of that meeting.

5 Decisions/Resolutions
5.1 A resolution is valid when it is agreed by consensus or by vote. If it appears that a consensus will not be reached, any Trustee may request a vote. The decision to vote on the matter at issue must be made by consensus. The vote itself must be passed by a simple majority of those present and voting at a duly convened and conducted meeting of the Trustees.

5.2 The Trustees may vary or cancel any resolution, including a resolution to vary or cancel a resolution.

5.3 A written resolution signed by all the Trustees shall be as effective for all purposes as a resolution made at a property convened and conducted meeting of the Trustees. Such a resolution may comprise several duplicated documents, each signed by one or more of the Trustees. Email communications from all the members indicating their decision, shall be deemed to be a written resolution signed by all members for the purpose of
this clause, provided that if required they are proved to be from the intended sender.

6 Minutes

6.1 The Trustees shall keep a proper record of all decisions taken and business transacted at every meeting of the Trustees.

6.2 Any minute of the proceedings at a meeting which signed by the chair of that meeting or by the chair of the next succeeding meeting shall be evidence of those proceedings.

6.3 Where minutes of the proceedings at a meeting of the Trustees have been made in accordance with the provisions of this rule then, until the contrary is proved, the meeting shall be deemed to have been properly convened and its proceedings to have been properly conducted.

7 Teleconference Meetings

For the purposes of these rules a Teleconference Meeting between a number of Trustees who constitute a quorum, together with the secretary or another person acting as a secretary, shall be deemed to constitute a meeting of the Trustees. All the provisions in these rules relating to meetings shall apply to Teleconference Meetings so long as the following conditions are met:

7.1 All of the Trustees for the time being entitled to receive notice of a meeting shall be entitled to notice of a Teleconference Meeting and to be linked for the purposes of such a meeting. Notice of a Teleconference Meeting may be given on the telephone;

7.2 Throughout the Teleconference Meeting each participant and the secretary or person acting as a secretary must be able to hear each of the other participants taking part.

7.3 At the beginning of the Teleconference Meeting each participant must acknowledge his or her presence for the purpose of that meeting to all the others taking part;

7.4 A participant may not leave the Teleconference Meeting by disconnecting his or her telephone or other means of communication without first obtaining the chair’s express consent. Accordingly, a participant shall be conclusively presumed to have been present and to have formed part of the quorum at all times during the Teleconference Meeting unless he or she leaves the meeting with the chair’s express consent;

7.5 A minute of the proceedings at the Teleconference Meeting shall be sufficient evidence of those proceedings, and of the observance of all necessary formalities, if certified as a correct minute by the chairperson of that meeting and by the secretary or person acting as a secretary.

8 Annual report and financial statements

At their first ordinary meeting in each Income Year (other than the first Income Year) the Trustees shall provide a report dealing with the affairs of the Trust, supported by a statement of the Trust’s Income and expenditure during the previous Income Year
and a statement of its assets and liabilities at the end of that Income Year is to be made available on The Waitaki Whitestone Geopark Trust webpage.
Schedule 2 Supporters

1 Supporters

1.1 Supporters are people and organisations who support the purposes of The Waitaki Whitestone Geopark Trust, and who wish to be associated with its activities and kept informed as Supporters by the Trustees or relevant Committee.

2 Founding Supporters of Trust

The Founding Supporters of the Trust are to be listed in a register to be held by the secretary or relevant Committee.

3 Meetings

3.1 The Supporters may meet and attend workshops.

3.2 Other meetings may be called by at least twenty (20) Supporters giving notice to the Trustees or the relevant Committee.

4 Supporters may nominate Trustees

A supporter may nominate a person to be a Trustee or member of a Committee by giving notice that nomination to the Secretary.

5 Limitation on rights of Supporters

5.1 A Supporter does not have a right to receive any of the income or capital of the Trust Fund.

5.2 No supporter of the Trust or any person associated with a Supporter of the Trust may determine or materially influence any decision of the Trustees relating to:

(a) the payment of any income of the Trust Fund to, or on behalf of, that Supporter or associated person; or

(b) the conferring of any benefit or advantage on, or on behalf of, that Supporter or associated person.

5.3 If any income is paid to a Supporter of the Trust or any person associated with a Supporter of the Trust, the income so paid must be reasonable and relative to that which would be paid in an arm's length transaction (being the open market value).

6 Ceasing to be a Supporter

6.1 A supporter may give written notice to the secretary or relevant Committee that it no longer wishes to be a Supporter of the Trust, at any time. As from the date of the notice, the Supporter will cease to be a Supporter of the Trust.

6.2 The Trustees or relevant Committee may terminate the membership of any Supporter by written notice to that Supporter. As from the date of the notice, the Supporter will cease to be a Supporter of the Trust.

6.3 All donations or other contributions made to the Trust by a supporter before that Supporter ceased to be a Supporter will remain the property of the Trust.
APPENDIX G

Legislation Summary [3.3]

Land Act 1948
Some of the land in the Waitaki Whitestone Global Geopark is managed under the Land Act for ‘pastoral purposes only’. The aim of the Act was to give the Crown lessee maximum rights consistent with the national interest, with the underlying principle that a secure tenure is the basis of farming progress. Leases run for 33 years with a perpetual right of renewal. Under the terms of the lease, the Commissioner of Crown Lands has consenting authority for any changes to land use beyond ‘extensive pastoralism’.

Crown Pastoral Land Act 1998
The purpose of the Crown Pastoral Land Act is to allow pastoral leases to be reviewed with the aim of transferring ownership of parts of the lease to private ownership and protecting other parts of the lease. This process is known as tenure review. Tenure Review is a statutory process administered by the Commissioner of Crown Lands. Many of the Commissioner of Crown Land’s functions are delegated to Land Information New Zealand (LINZ). The Tenure Review process can result in the retention of some land by the Crown as Public Conservation Land, the freehold disposal of some land to the lease-holder, and/or the imposition of protective mechanisms such as public access easements and conservation covenants on land made freehold.

Conservation Act 1987
The Conservation Act integrates conservation management functions and sets out the responsibilities and roles of the Department of Conservation. The Department of Conservation (DOC) has a particular responsibility under section 4 of the Conservation Act to interpret and administer the Act to give effect to the principles of the Treaty of Waitangi. This involves building and supporting effective conservation partnerships with tangata whenua at the local level. There is also specific legislation for such things as wildlife, reserves and national parks. Amongst other functions, DOC are responsible for the management for conservation purposes of all land and natural and historic resources held under the Conservation Act. Conservation areas include, Specially Protected Areas (including ecological areas, amenity areas and wildlife management areas) and Marginal Strips.

Queen Elizabeth II National Trust Act 1977; Reserves Act 1977
The QEII Act establishes the QEII National Trust as a statutory independent organisation with the responsibility to protect open space. Under the QEII Act the QEII National Trust can register open space covenants to protect land in perpetuity, manage land under QEII ownership and provide grants for projects related to open space.

Reserves Act 1977
The Reserves Act provides for the acquisition of land for reserves, and the classification and management of reserves (including leases and licences). Within the Waitaki Whitestone Global Geopark area, the Reserves Act is primarily administered by the Department of Conservation and the Waitaki District Council. The Reserves Act has three main functions; to provide for the preservation and management (for the benefit and enjoyment of the public) areas possessing some special feature or values such as recreational use, wildlife, landscape amenity or scenic value; to ensure, as far as practicable, the preservation of representative natural ecosystems or landscapes and the survival of indigenous species of flora and fauna, both rare and commonplace, and; to ensure, as far as practicable, the preservation of access for the public to the coastline, islands, lakeshore and riverbanks and to encourage the protection and preservation of the natural character of these areas. Within the WWG area, the Waitaki Reserves Management Plan 2014 guides the management of reserves.
The Crown Minerals Act 1991 sets out the broad legislative framework for the issuing of permits to prospect, explore and mine Crown-owned minerals within New Zealand. Crown-owned minerals include petroleum, gold, silver and uranium, and all minerals on or under Crown land. In some cases the Crown also has rights to certain minerals in some private land. The Act provides rules for entry onto land to prospect, explore or mine the Crown’s minerals, including limitations on entry to areas of special importance to Māori and to areas of particular conservation value.

Walking Access Act 2008
The Walking Access Act provides the New Zealand public with free, certain, enduring, and practical walking access to the outdoors (including around the coast and lakes, along rivers, and to public resources) so that the public can enjoy the outdoors. The Act enabled the establishment of the New Zealand Walking Access Commission as a Crown entity with a range of functions. One function gives the Commission responsibility for ‘administering a fund to finance the activities of the Commission, or any other person, in obtaining, developing, improving, maintaining, administering, and signposting walking access over any land’. The WWG will work in partnership with the Commission, local landowners and stakeholders to strengthen existing access and facilitate new opportunities for people to access and enjoy the Geopark area.

Heritage New Zealand Pouhere Taonga Act 2014
The Heritage New Zealand Pouhere Taonga Act (2014) guides Heritage New Zealand and promotes the identification, protection, preservation and conservation of the historical and cultural heritage of New Zealand. The Act provides for heritage covenants, prohibits the modification or destruction of archaeological sites (unless an authority is obtained) and provides for the New Zealand Heritage List/Rārangi Kōrero and the National Historic Landmarks/Ngā Manawhenua o Aotearoa me ōna Kōrero Tūturu as a means for recognising heritage values. The Act further prescribes the relevant authorities and their responsibilities in supervision and inspection.

Resource Management Act 1991
The Resource Management Act (RMA) promotes the sustainable management of natural and physical resources such as land, air and water. The RMA seeks to integrate the management of air, land, fresh water and marine areas via a hierarchy of policies and plans prepared at the national, regional and district levels. The RMA also encourages public participation in decision-making processes. Within the Waitaki Whitestone Global Geopark area, Environment Canterbury, Otago Regional Council and the Waitaki District Council are responsible for administering the functions of the RMA. The Waitaki District Council is responsible for the establishment, implementation and review of objectives, policies and methods to achieve integrated management of the effects of the use, development or protection of land and the associated natural and physical resources of the district. The Waitaki District Plan is the primary instrument through which these functions are carried out. The Waitaki District Plan is currently under review. This review process provides an opportunity to put forward objectives and policies for the sustainable management of the WWG and to provide a rule framework for the protection of individual geopark sites from inappropriate development.
APPENDIX H

How to use the Mapping Website [3.5]

Waitaki Whitestone Geopark mapping website

This website is available within the Waitaki Whitestone Geopark website or as a stand-alone mapping website:

https://maps.waitaki.govt.nz/GMSC/Public/GeoparkGIS.html

The mapping website has been created to make geosite information easily accessible. As well as a map layer for Geosites, it contains the following:

**Nature Sites**: with special biological features in the Geopark

**Ag and Industry Sites**: showcasing local producers and the agricultural heritage of the area

**Places to Stop**: Local attractions and great places to stop and view the stunning landscape encapsulated within the geopark

**Eat and Drink**: Places for refreshment on your geopark adventure

**Places to Stay**: Accommodation available throughout the Geopark

**Culture**: Other culturally significant and interesting sites within the geopark area

**Trails**: Routes you can follow by bike, vehicle or on foot around Geosites

**Our Stories**: A special layer included to help encourage further learning about this special place
APPENDIX I

Survey Data [3.7]

A number of visitor surveys were carried out during April 2018 within the Waitaki Whitestone Geopark area. The data below provides a graphical presentation of the survey results. It is anticipated that more extensive surveys will be undertaken in the future to provide regular monthly, and possibly weekly, survey results. These surveys would initially be focused around the more significant geological sites within the Geopark (Elephant Rocks, Clay Cliffs and Moeraki Boulders), but will eventually be rolled out to other geopark sites.

The field surveys provide an overview of the following factors;

- Nationalities visiting the Geopark sites;
- Length of stay;
- How visitors found out about that particular site;
- Visitor awareness of the UNESCO Global Geopark concept;
- Have other geopark sites been visited;

Survey methodology
The surveys were undertaken on random days (and random weather) over a period of approximately 4 hours. The surveys were undertaken by volunteers manually counting and verbally questioning visitors arriving at the sites. Where groups arrived together, only one person from the group was questioned, but all members of the group were tallied. Due to volunteer limitations, some groups were unable to be questioned, but were counted in terms of their numbers. It is acknowledged that future surveys may need to refine this aspect and explore ways of questioning all visitors arriving at the site to ensure a wider response rate.

The surveys considered a number of aspects. The first aspect was to give an overview of how many people of different nationalities visited the Waitaki geopark sites with the highest level of geological significance. The survey also asked how long visitors were planning to stay in NZ and in particular the Waitaki area, how they found out about the visited site, if they have any knowledge about a UNESCO Global Geopark and if they had visited other sites during their stay. The sites surveyed were; Moeraki Boulders, Clay Cliffs and Elephant Rocks.

Conclusions
It is important to note that this survey is a snapshot rather than comprehensive, ongoing survey data. Future surveys will be undertaken to more accurately describe the type of people visiting the sites in the Geopark and their satisfaction levels. Very little survey data currently exists within the Whitestone Waitaki Geopark and these surveys were created specifically for the Expression of Interest application. It is the full intention of the WWG to commence a formal process of data gathering and collection to better understand visitor numbers and to monitor and evaluate satisfaction levels.

The WWG is now working jointly with Tourism Waitaki on other surveys which will be undertaken to provide more efficient details about the people frequenting the geopark. These surveys will be used and improved to further inform and develop the marketing strategy undertaken by Tourism Waitaki.
Survey Questions:

Question 1: What is the age of the questioned visitor?
A. Under 25  
B. 26-45  
C. 46-65  
D. 66 and over

Question 2: What is the country where the questioned visitor is born and raised (nationality)?

Question 3: How did the visitor find out about the relevant site?
Options:
- TNZ-Tourism NZ  
- TW-Tourism Waitaki  
- SM-Social Media  
- INT-Internet  
- Other-could be a friend/family, book or application

Question 4: How long is the stay in New-Zealand of the questioned visitor?  
(This question is noted in days)

Question 5: How long is the stay in the Waitaki District of the questioned visitor?  
(This question is noted in days)

Question 6: Does the questioned visitor have any knowledge about the UNESCO Global Geopark?  
(yes or no option)

Question 7: Has the questioned visitor visited one of the following places?  
Moeraki Boulders,  
Vanished World Trail,  
Elephant Rocks,  
Vanished World Centre, Duntroon
Survey Results

MOERAKI BOULDERS

Date: 16/04/2018
Time duration: 12.00-4.00pm

Number of people who were interviewed:
69 questioned visitors
255 unquestioned visitors
324 people in total.

Summary of results:
1st South Island (NZ) at 47 people,
2nd Australia at 34 people,
3rd USA at 19 people.

Summary of results:
1st - 26-45yrs at 33% of responders,
2nd - 0-25yrs at 32% of responders,
3rd - 46-65yrs at 29% of responders

A high proportion of responders knew about the entity called UNESCO, but not specifically about the Global Geopark Project.
25% of responders were aware that there was a project to safeguard geological & cultural heritage. Most of these had heard of World Heritage Status but not the global geopark project.
A high proportion of responders knew about the entity called UNESCO, but not specifically about the Global Geopark Project. 25% of responders were aware that there was a project to safeguard geological & cultural heritage. Most of these had heard of World Heritage Status but not the global geopark project.

The first information source used to find this site was clearly 'other' which includes: family, friends, road sign, traveling books, accommodation providers, applications etc.

Internet sources were the second most common way of finding out about this particular site.

The left bar chart shows how many visitors at the Moeraki boulders visited one of the following five sites. 45 people at Moeraki boulders visited Clay Cliffs, 29 people visited Elephant Rocks, 21 visited Maori Rock Art, 3 visited Vanished World Center and 2 visited the vanished world trail.

The above chart shows the amount of time spent in New Zealand by visitors (blue) with the orange section demonstrating the amount of time spent in the Waitaki District. This graph shows that the proportion of time spent in the Waitaki area is low compared to the time spent in New Zealand. Most of those questioned were merely travelling through the Waitaki District and did not intend to spend a lot of time exploring the area.
CLAY CLIFFS

Date: 20/04/2018
Time duration: 10.00am to 4.00pm

Number of people who were interviewed:
52 questioned visitors
133 unquestioned visitors
185 people in total.

Summary of results:
1st South Island (NZ) at 46 people,
2nd North Island (NZ) at 29 people,
3rd Australia at 14 people.

Summary of results:
1st - 26-45yrs at 41% of responders,
2nd - 0-25yrs at 32% of responders,
3rd - 46-65yrs at 27% of responders

A high proportion of responders knew about the entity called UNESCO, but not specifically about the Global Geopark Project.
21% of responders were aware that there was a project to safeguard geological & cultural heritage. Most of these had heard of World Heritage Status but not the global geopark project.
The left bar chart shows how many visitors at Clay Cliffs visited one of the following five sites. 60 people at Clay Cliffs visited Moeraki boulders, 32 people visited Elephant Rocks, 25 visited Maori Rock Art, 17 visited Vanished World Center and 15 visited the vanished world trail.

The first information source used to find this site was clearly ‘other’ which includes: family, friends, road sign, traveling books, accommodation providers, applications etc.

Internet sources were the second most common way of finding out about this particular site.

The above chart shows the amount of time spent in New Zealand by visitors (blue) with the orange section demonstrating the amount of time spent in the Waitaki District. This graph shows that the proportion of time spent in the Waitaki area is low compared to the time spent in New Zealand. Most of those questioned were merely travelling through the Waitaki District and did not intend to spend a lot of time exploring the area.
ELEPHANT ROCKS:

Date: 14/04/2018
Time duration: 10.30am to 3.30pm

Number of people who were interviewed:
34 questioned visitors
37 unquestioned visitors
71 people in total.

Summary of results:
1st North Island (NZ) at 14 people,
2nd South Island (NZ) at 10 people,
3rd USA at 8 people.

Nationality of the respondents

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<tr>
<th>Country</th>
<th>Amount of Visitors</th>
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<td>North NZ</td>
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<td>China</td>
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<tr>
<td>India</td>
<td>3</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
</tr>
</tbody>
</table>

Summary of results:
1st - 26-45yrs at 45% of responders,
2nd - 46-65yrs at 28% of responders
3rd - 65+yrs at 20% of responders,

A high proportion of responders knew about the entity called UNESCO, but not specifically about the Global Geopark Project. 19% of responders were aware that there was a project to safeguard geological & cultural heritage. Most of these had heard of World Heritage Status but not the global geopark project.
Conclusions

It is important to note that this survey is a snapshot rather than comprehensive, ongoing survey data. Future surveys will be undertaken to more accurately describe the type of people visiting the sites in the Geopark and their satisfaction levels. Very little survey data currently exists within the Whitestone Waitaki Geopark and the surveys were created specifically for the Expression of Interest application. It is the full intention of the WWG to commence a formal process of data gathering and collection to better understand visitor numbers and to monitor and evaluate satisfaction levels. The WWG is now working jointly with Tourism Waitaki on other surveys which will be undertaken to provide more efficient detail about the people frequenting the geopark. These surveys will be used and improved to further inform and develop the marketing strategy undertaken by Tourism Waitaki.

The above chart shows how many visitors at Elephant Rocks visited one of the following five sites. 41 people at Moeraki Boulders, 35 people visited Maori Rock Art, 22 visited Clay Cliffs, 10 visited Vanished World Center and 8 visited the vanished world trail.

The first information source used to find this site was clearly ‘other’ which includes: family, friends, road sign, traveling books, accommodation providers, applications etc.

Internet sources were the second most common way of finding out about this particular site.

The left bar chart shows how many visitors at Elephant Rocks visited one of the following five sites. 41 people at Moeraki Boulders, 35 people visited Maori Rock Art, 22 visited Clay Cliffs, 10 visited Vanished World Center and 8 visited the vanished world trail.

The left bar chart shows the amount of time spent in New Zealand by visitors (blue) with the orange section demonstrating the amount of time spent in the Waitaki District. This graph shows that the proportion of time spent in the Waitaki area is low compared to the time spent in New Zealand. Most of those questioned were merely travelling through the Waitaki District and did not intend to spend a lot of time exploring the area.
APPENDIX J

Mind Map

A large ‘Mind Map’ has been utilised as an aide memoir by the Project and Advisory Groups, allowing participants to keep track of what is an extremely complex and interwoven project. The Mind Map does not attempt to provide a definitive representation of all geosite and other elements within the project. The intent is for the Mind Map to act as a prompt in ensuring that all of the interconnectivities between various elements of the Global Geopark are ‘front of mind’ when considering geopark matters. The Mind Map alters on a daily basis. This is a ‘snap shot’ of it as of 28 April 2018.

This link to this Mind Map provides access to the Mind Map document on Dropbox.