

Ancient Waitakere Volcano (15–22 million years ago)

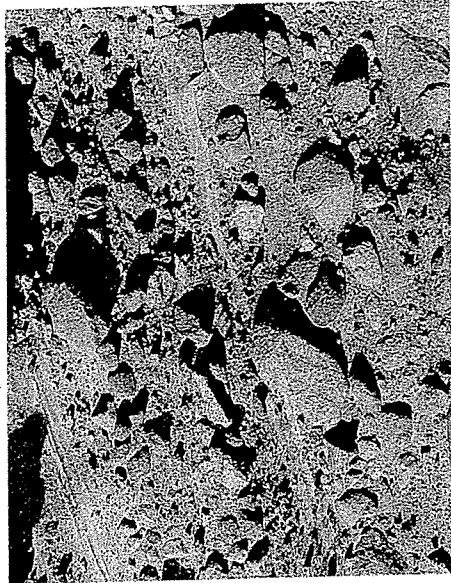
Forming the western boundary to the Waitemata Basin was an actively growing Waitakere Volcano, which was centred some 20 km offshore from the present west coast. It began erupting on the floor of the deep sea about the same time as the basin was subsiding, 22 million years ago. It eventually grew so big that its top pierced the waves and was capped by one or more volcanic islands. Over a period of 6–7 million years it built a 50-km-diameter, 3000-m-high volcano on the floor of the sea. It was similar in nature to our modern volcanoes of Ruapehu, Ngauruhoe and Tongariro, except that it grew to five or six times the size of all three of these volcanoes combined.

Eroded remnants

The modern Waitakere Ranges are the greatly eroded remnants of the eastern slopes of the huge Waitakere Volcano. Out to the west of the Waitakeres, beneath the continental shelf and slope, geophysicists have used seismic reflection profiling to detect and map the former extent of these old volcanic rocks. Now all that remains out there is the flattened-off footprint of a once majestic volcano, its former glory removed by millions of years of erosion by the incessantly pounding waves of the stormy Tasman.

Piha Conglomerate

Most of the west and central Waitakere Ranges today consist of weakly layered volcanic conglomerate and breccia (Piha Conglomerate) that had been swept down the sides of the growing volcano in undersea lahars of gravel, sand and water and came to rest on its submarine slopes. These



Weakly layered volcanic conglomerate (Piha Conglomerate) that accumulated on the upper submarine slopes of the Waitakere Volcano.

rocks can be seen in road cuttings along parts of the Scenic Drive, in the Mokoroa Waitakere and Fairy Falls, and alongside the Upper Nihotupu Reservoir.

Submarine slides

Scattered throughout the Waitakeres are folded, contorted and mixed strata and blocks within the more consistently layered sequences. These record periodic rock slides down the volcano's submarine slopes. Examples can be seen in a road cutting near Arataki, and in cliffs at Whatipu and Anawhata.

Pillow lava flows

Preserved within the sequences of Piha Conglomerate and Nihotupu Sandstone are a few, hard, dark grey, pillow lava flows formed by the cooling of lava that had spewed out into the sea on the volcano's slopes. When seen in cross-section in cliffs, these often appear to be composed of a pile of discrete pillow-like forms. As narrow lobes of hot



These narrow lobes of pillow lava were extruded onto the sea floor about 17 million years ago and are now exposed in the cliffs 1 km south of Muriwai.

lava are extruded into the cold sea water, their outsides are rapidly quenched, forming a black glassy skin around the flowing molten lava inside. The skin sometimes breaks and another lobe may branch off. Later, as the lava inside the lobe slowly cools to form rock, it contracts and distinctive radiating joints are formed. Examples of these pillow lava flows can be seen at Muriwai, Te Henga Beach and Nihotupu Falls.

Eruptions on the eastern flanks

As volcanic activity was drawing to a close about 16 million years ago, the Waitakere Volcano (and presumably also the Waitemata Basin) was pushed up out of the sea by enormous forces deep in the earth. Two lines of volcanic vents began erupting on the volcano's uplifted eastern flanks. The remnants of one line of vents now lie in the vicinity of the Scenic Drive, and remains of a second, more active line of vents can now be seen along the Waitakeres' west coast. Some of these are eroded volcanic necks, composed of scoria, volcanic bombs and lava flows that had collapsed back into its throat, like Lion Rock at Piha. Others are explosion craters filled with lava flows or domes of extruded viscous lava, such as The Watchman at Karekare or in the cliffs of Whites Beach and O'Neill Bay.

These two lines of vents poured extensive lava flows over the surrounding land. Today these eroded and deeply weathered flows form a thin cap along the ridges of the central Waitakere Ranges and can be seen as the weathered red and purple clays in many of the cuttings on the Piha Road.