

## 2 Tanners Point

### 2.1 Site description

Tanners Point extends out into the northern basin of the Tauranga Harbour, approximately 3.5 km southwest from the Katikati Entrance. The shoreline consists of around 1.2 km of coastal cliffs and approximately 0.4 km of unconsolidated shoreline. The site is split into 7 cells based on differences in exposure, morphology and shoreline elevation (Figure 2-1).



Figure 2-1 Location and cell extent of the Tanners Point shoreline within Tauranga Harbour.

The northern side of Tanners Point is relatively sheltered with a maximum fetch of 2 km from the north. At the western end of the north-facing side (Cell 2A), the shoreline gradually slopes to a low grass area with a backshore elevation less than 2 m above RL. Further towards the northeast is a small embayment (Cell 2C) bound by cliffs on either side, which range in elevation from RL 6 to 9 m (Cell 2B and Cell 2D). Within the embayment the shoreline gradually slopes to a grass reserve at approximately 2 m above RL. A small berm with dense accumulation of shells exists at the edge of the grass (Figure 2-2A).

The north-eastern tip of Tanners Point is characterised by coastal cliffs which stand between RL 6 to 9 m (Cell 2D) (Figure 2-2B). The cliffs are exposed to a fetch approximately 3 km across from Bowentown in the northeast. The cliffs continue around the eastern side of the shoreline and run parallel to Tuapiro Channel (Cell 2E). The east-facing cliffs range in elevation from RL 10 to 22 m and are densely vegetated with large, overhanging pohutukawa trees (Figure 2-2C). A shore platform, approximately 10 m wide, extends from the base of the cliffs to the edge of Tuapiro Channel. The east-facing cliffs are orientated with direct exposure to the open ocean through the Katikati Entrance. However, there is approximately 0.5 km of intertidal flats in the middle of the harbour which are likely to dissipate most wave energy.

North from the boat ramp at the end of Tanners Point Road (Tanners Point Recreational Reserve) the unconsolidated shore gradually slopes up from the Tuapiro Channel and transitions to a very narrow high-tide beach which is backed by a grass reserve (Cell 2F) (Figure 2-2D). South from the boat ramp are more densely vegetated cliffs.

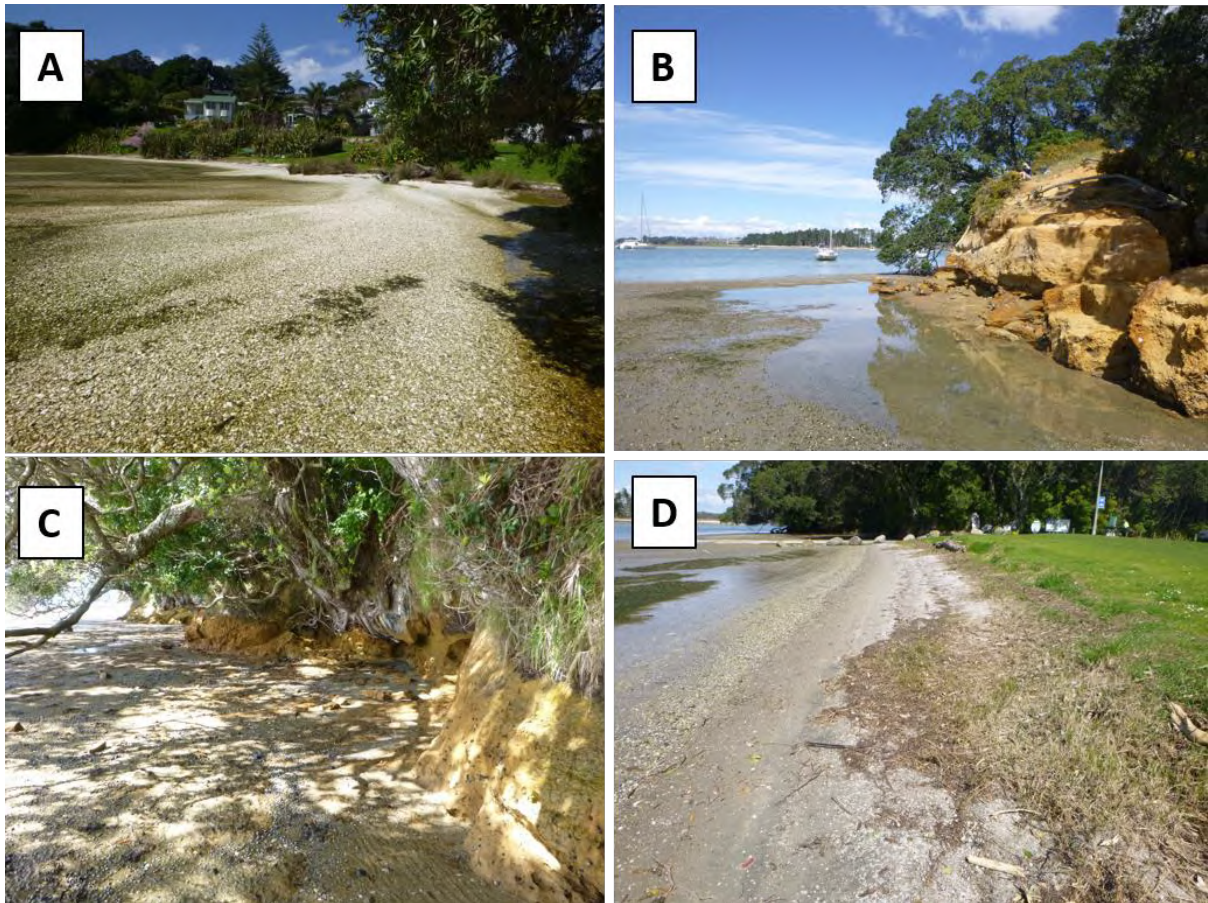


Figure 2-2 Site photos for Tanners Point. (A) Coarse shell berm (Cell 2C), (B) exposed cliffs at the tip of Tanners Point (Cell 2D), (C) cliff toe with dense pohutukawa overhanging (Cell 2E), (D) unconsolidated shoreline (Cell 2F).

## 2.2 Geology

The geological map of the area<sup>2</sup> indicates that the site comprises:

- Matua Subgroup: Poorly to moderately sorted gravel with minor sand and silt underlying terraces; includes minor fan deposits and loess.
- Holocene river deposits: Alluvial gravel, sand, silt, mud and clay, with local peat.

Field observations of cliff exposures are consistent with the published geology.

The existing slope angles in this area are between 3° to 20° in unconsolidated areas, and between 20° to 50° in areas of banks or low cliffs. The range of stable slope angles for the Tanners Point area are shown in Table 2-1 below.

The failure types observed around Tanners Point were typically shallow surface failures. The likelihood of deep seated movement is low.

## 2.3 Coastal processes

Due to extensive tree cover along the cliff shoreline around Tanners Point, it is difficult to determine long term cliff erosion rates. However, based on regression analysis within Cell 2D the shoreline (since 1982) shows an average long term erosion rate of -0.1 m/yr. The other coastal cells along the

<sup>2</sup> Edbrooke, S.W. (compiler) 2001: *Geology of the Auckland area*. Institute of Geological & Nuclear Sciences 1:250,000 geological map 3. 1 sheet + 74 p. Lower Hutt, New Zealand. Institute of Geological & Nuclear Sciences Limited.

north-western side of Tanners Point show similar long term erosion rates, except the sheltered embayment within Cell 2C, where periods of sediment accretion is apparent and the maximum erosion rate is -0.05 m/yr. Based on an average 1.5 km fetch from the northwest, the theoretical significant wave height along the north-western side of Tanners Point is estimated to be 0.8 m. Based on model results the short term storm cut is estimated to range from 1 to 3 m.

Long term erosion rates for the cliffs on the eastern side of Tanners Point are estimated to be up to -0.2 m/yr. The eastern cliffs are exposed to larger fetches than the north-western side and tidal currents, due to proximity of the Tuapiro Channel, are likely to induce higher erosion rates along the eastern side. Field observations provide evidence of scour and undercutting along sections of the well-vegetated cliffs. The estimate long term erosion rates are also consistent with the -0.2 m/yr estimated by Opus (2015).

Regression analysis within the unconsolidated shoreline of Cell 2F indicates slightly lower erosion rates (up to -0.1 m/yr). The shoreline within Cell 2F is offset further landward from Tuapiro channel than the adjacent cliff cells and therefore is more sheltered. Based on a 2 km fetch from the east, the theoretical significant wave height is estimated to be 0.9 m. Model results estimate the short term storm cut to range from 2 to 5 m.

SLR response factors range from 0.1 to 0.3 for the sheltered north-western cliffs, and from 0.2 to 0.4 for the exposed eastern cliffs.

## 2.4 Local considerations

In addition to the boat ramp at the end of Tanners Point Road, there is a timber seawall at the northern end of the Tanners Point Recreational Reserve (Cell 2F). The structure is approximately 1.5 to 2 m high and appears relatively good condition. The structure runs parallel to the grass bank where a jetty/pontoon extends out into the edge of the Tuapiro channel (Figure 2-3).

In the past there has been some sand re-nourishment along the unconsolidated shoreline within Cell 2F.



Figure 2-3 Examples of protection structures around Tanners Point. (A) Timber seawall and pontoon (Cell 2F), (B) timber seawall at the edge of grass reserve (Cell 2F).

## 2.5 Adopted component Values

Adopted component values are presented within Table 2-1. The short term values are equal to zero for the consolidated cells as short term erosion is not applicable for consolidated shorelines (see section 4.6.2 in main report).

**Table 2-1 Adopted component values for the cells around Tanners Point.**

Site		2. Tanners Point						
Cell		2A	2B	2C	2D	2E	2F	2G
Cell centre (NZTM)	E	1860200	1860324	1860393	1860498	1860559	1860533	1860452
	N	5847698	5847810	5847818	5847919	5847759	5847566	5847295
Morphology		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Consolidated	Unconsolidated	Consolidated
Geology		Holocene river deposits	Matua Subgroup	Holocene river deposits	Matua Subgroup	Matua Subgroup	Holocene river deposits	Matua Subgroup
Exposure (average fetch/direction)		0.5 km (NW)	0.5 km (NW)	2 km (N)	2 km (N)	4 km (E)	2 km (E)	3 km (E)
State		Natural	Natural	Natural	Natural	Natural	Partially protected	Natural
Short-term (m)	Min	1	0	1	0	0	2	0
	Mode	2	0	2	0	0	3	0
	Max	3	0	3	0	0	5	0
Dune/Cliff elevation (m above toe or scarp)	Min	1	8	1	6	10	1	12
	Mode	1.5	10	1.5	8	15	1.5	16
	Max	2	11	2	10	22	2	21
Stable angle (deg)	Min	30	24	30	24	24	30	24
	Mode	32	26	32	26	26	32	26
	Max	34	40	34	40	50	34	50
Long-term (m/yr)	Min	-0.14	-0.1	-0.05	-0.15	-0.2	-0.1	-0.2
	Mode	-0.1	-0.05	0	-0.1	-0.15	-0.05	-0.15
	Max	-0.03	-0.02	0.08	-0.05	-0.1	-0.02	-0.1
Closure slope (beaches)/ SLR response factor (cliffs)	Min	0.05	0.1	0.05	0.1	0.2	0.05	0.2
	Mode	0.1	0.2	0.1	0.2	0.3	0.1	0.3
	Max	0.15	0.3	0.15	0.3	0.4	0.15	0.4

## 2.6 Coastal erosion hazard assessment

Coastal erosion hazard distances for Tanners Point are presented within Table 2-2 and an overview map in Figure 2-4. Histograms of individual components and resultant erosion hazard distances using a Monte Carlo technique are shown in Appendix B. For the purpose of this assessment all coastal erosion protection structures have been ignored (refer to main report Section 4.5.4).

The current P<sub>66%</sub> erosion hazard ranges from -3 m to -5 m for the unconsolidated shoreline and from -16 m to -23 m along the cliffs.

The P<sub>5%</sub> for 1.6 m SLR in 2130, ranges from -22 m on the sheltered, unconsolidated shoreline to -70 m along the exposed, east-facing cliffs. The large future values along the cliffs is due to the large fetch exposure and hence a high SLR response factor.

**Table 2-2 Coastal erosion hazard widths (m) for current, 2080 and 2130 timeframes.**

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance						
				Min	P <sub>66%</sub>	P <sub>50%</sub>	P <sub>5%</sub>	P <sub>1%</sub>	Max	
Tanners Point	2A	Current	0.03	-3	-4	-5	-5	-6	-6	
		50yr (2080)	0.12	-4	-8	-9	-11	-12	-13	
			0.2	-5	-9	-10	-12	-13	-14	
			0.4	-7	-11	-12	-15	-16	-17	
			0.6	-8	-13	-14	-17	-18	-21	
		100yr (2130)	0.22	-7	-13	-14	-18	-19	-20	
			0.6	-10	-16	-18	-22	-23	-27	
			0.8	-11	-18	-20	-24	-26	-30	
			1.25	-15	-23	-24	-31	-33	-38	
		1.6	-17	-26	-28	-35	-39	-44		
		2B	Current	0.03	-11	-16	-18	-22	-23	-25
			50yr (2080)	0.12	-12	-19	-20	-25	-27	-29
	0.2			-12	-19	-21	-26	-27	-29	
	0.4			-13	-20	-21	-26	-28	-31	
	0.6			-13	-20	-22	-27	-29	-31	
	100yr (2130)		0.22	-13	-22	-23	-29	-31	-35	
			0.6	-14	-23	-25	-31	-33	-37	
			0.8	-14	-24	-25	-31	-34	-38	
			1.25	-15	-24	-26	-33	-35	-40	
	1.6		-15	-25	-26	-33	-36	-41		
	2C		Current	0.03	-1	-3	-3	-4	-4	-5
			50yr (2080)	0.12	3	-2	-3	-5	-6	-7
		0.2		2	-3	-4	-6	-7	-8	
		0.4		0	-5	-6	-8	-9	-11	
		0.6		-1	-7	-8	-11	-12	-15	

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance							
				Min	P <sub>66%</sub>	P <sub>50%</sub>	P <sub>5%</sub>	P <sub>1%</sub>	Max		
Tanners Point	2C	100yr (2130)	0.22	7	-1	-2	-7	-8	-10		
			0.6	3	-5	-6	-11	-13	-15		
			0.8	1	-7	-8	-13	-15	-19		
			1.25	-2	-11	-13	-19	-22	-27		
			1.6	-5	-14	-16	-24	-28	-33		
	2D	Current		0.03	-9	-14	-15	-20	-21	-23	
				0.12	-12	-19	-20	-25	-27	-30	
		50yr (2080)		0.2	-12	-20	-21	-26	-27	-31	
				0.4	-13	-21	-22	-27	-29	-33	
				0.6	-14	-21	-23	-28	-30	-34	
				0.8	-14	-21	-23	-28	-30	-34	
		100yr (2130)		0.22	-15	-24	-25	-31	-33	-36	
				0.6	-16	-26	-28	-34	-37	-40	
				0.8	-16	-27	-29	-35	-38	-42	
				1.25	-17	-28	-30	-37	-40	-45	
				1.6	-17	-29	-31	-39	-42	-46	
		2E	Current		0.03	-11	-22	-25	-38	-43	-48
					0.12	-17	-30	-32	-45	-50	-57
	50yr (2080)			0.2	-19	-31	-34	-47	-52	-58	
				0.4	-20	-34	-37	-50	-55	-62	
				0.6	-21	-36	-38	-52	-57	-65	
				0.8	-21	-36	-38	-52	-57	-65	
	100yr (2130)			0.22	-23	-37	-40	-53	-58	-65	
				0.6	-27	-43	-46	-60	-65	-73	
				0.8	-29	-45	-48	-62	-67	-76	
				1.25	-31	-49	-52	-67	-72	-82	
	2F	Current		0.03	-3	-5	-5	-7	-7	-8	
				0.12	-5	-8	-8	-10	-11	-12	
		50yr (2080)		0.2	-5	-8	-9	-11	-12	-13	
				0.4	-7	-10	-11	-14	-14	-17	
				0.6	-9	-12	-13	-16	-17	-20	
				0.8	-9	-12	-13	-16	-17	-20	
		100yr (2130)		0.22	-5	-10	-11	-15	-16	-17	
				0.6	-9	-14	-15	-19	-20	-24	
				0.8	-10	-16	-17	-21	-23	-27	
				1.25	-14	-20	-22	-28	-30	-35	
1.6				-16	-24	-25	-33	-36	-42		
2G		Current		0.03	-14	-23	-26	-38	-42	-48	
	0.12			-19	-31	-33	-45	-50	-55		
	50yr (2080)		0.2	-20	-32	-35	-47	-51	-57		
			0.4	-21	-35	-38	-50	-54	-60		
			0.6	-22	-37	-40	-52	-56	-63		

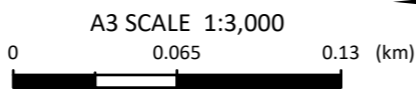
Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	P <sub>66%</sub>	P <sub>50%</sub>	P <sub>5%</sub>	P <sub>1%</sub>	Max
	2G	100yr (2130)	0.22	-24	-38	-41	-53	-57	-64
0.6			-28	-44	-47	-60	-64	-71	
0.8			-29	-46	-49	-62	-67	-74	
1.25			-31	-50	-53	-67	-72	-81	
1.6			-32	-52	-56	-70	-75	-85	

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Notes: - Aerial photograph sourced from the LINZ Data Service (dated 2015)  
 - Coastal Erosion Hazard Areas (CEHA) are offset from the baseline (2014-2017)  
 - Refer to Stephens, 2018 for all MHWS7 scenarios



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**Tauranga Harbour Coastal Erosion Assessment**  
 Erosion Hazard Overview  
 Site 2: Tanners Point

FIGURE No. Figure 2-4

Rev. 0