

Footnotes

- Although the transliteration of Port Nicholson became 'Poneke', there is general recognition that Wellington harbour was known as 'Te Whanganui a Tara' prior to European settlement and this name is still widely recognised
- 1 Based on *Evening Post*, 22, 23 and 25 October 1883
- 2 Attributed to Sir John Luke (Mayor 1913-21) and William Morton (City Engineer from 1904-23), John Mulgan, *The City of the Strait*, 1940, p204
- 3 John M Thomson, *A Distant Music – The Life and Times of Alfred Hill 1870-1960*, Auckland, 1980, p12
- 4 The Wellington Town Board appointed a Board of Works on 14 June 1864 to oversee these municipal works. Wellington Town Board Minute Book 1, 14 June 1864, 00165:0:1, p58, Wellington City Archives
- 5 John E Martin, *The House*, Wellington, 2005, p41
- 6 Ebenezer Maxwell, 'Wade's Town in the 1860s', in *Recollections and Reflections of an Old New Zealander*, Reed, 1935, in *The Onslow Historian*, 11/1, 1981, p22
- 7 Both quotes Nicholas Marchant, H-3, 1871, *Appendices to the Journal of the House of Representatives*
- 8 'Reports and Proceedings of the City Corporation on a Water Supply to the City', 1871. Dr Hector's Report to WCC Committee, 0030:1:1, Wellington City Archives
- 9 Wellington Waterworks Engineer JS Carmichael, 29 July 1958, identified Dr John Snow and Louis Pasteur. 'Historical material – Water Supply', file 6/10/1, vol 1, WRC
- 10 *Wellington Independent*, editorial, 19 February 1867
- 11 *Wellington Independent*, editorial, 19 February 1867. This ridge, over which Hill and Parliament streets travel, was largely removed for the Wellington Motorway in the 1970s; Plan 'Tinakori Water Supply', W.1159/7, Longitudinal Section, 1887. Beck supplied water to the wharf for seven years, in agreement with the Provincial Government. See also *Cyclopaedia of NZ*, Wellington, 1897, p763; WCC Board of Works meeting, 15 March 1867, 00165:0:2, p154, Wellington City Archives; WCC Minute Book 3, 22 December 1871, p156
- 12 Plan 'Tinakori Water Supply', W.1159/7-8, 1887, at 122 (now 260) Tinakori Road. A reservoir was built on Hill Street, just above the Parliament, in 1867-68; *Wellington Independent*, editorial, 19 February 1867
- 13 Wellington Town Board, Board of Works meeting, 17 April 1868, reported in *Wellington Independent*, 18 April 1868, p5; Rod Cook, *Parliament, The Land and Buildings from 1840*, Parliamentary Services, 1988, p42
- 14 *Wellington Independent*, 17 October 1868, p5. The Government asked £60 pa, and 49 householders and nine publicans agreed to pay £123 pa (£2 and £3 respectively) for the water; *Wellington Independent*, 5 December 1868, p4
- 15 Within six years the Hill Street reservoir was being filled by WCC instead of drawing from the Tinakori Road spring [WCC 30 April 1874, 00166:0:1, pp365, 370]; Nicholas Marchant to Question 16, Minutes of Evidence, 29 October 1877, 'Government Buildings Water Supply Committee (Report of)' Legislative Council, 1877, no 15; WCC Committee Book 6, 3 April 1883, p69]. This reticulation still in use in 1961
- [Annotation to Plan WDO 3906, 13 July 1956]
- 16 City Surveyor's Annual Report to 30 June 1869, Board of Works Minutes, 00165:0:2, pp424, 514, Wellington City Archives; *Wellington Independent*, 17 July 1869, p5; Warship visits were increasing – with the Duke of Edinburgh arriving on HMS *Galatea* in April 1869, USS *Kearsage* visiting in September 1869 and a RN squadron visit announced in November. These were in addition to regular warship visits from Sydney. TD Taylor, *NZ's Naval Story*, Reed, 1948, pp118, 243
- 17 Wellington Town Board meeting, 3 May 1867; *Wellington Independent*, 4 May 1867, p4; Richard Mixer Skeet (1832-94) was Wellington's first Surveyor/Engineer, 12 September 1864 – 16 September 1867. See *Wellington Independent*, 1 October 1864, p2
- 18 N Marchant, Report to Subcommittee Meeting, 13 October 1870, WCC Minutes, 00164:0:1, p6, Wellington City Archives. Baker's cutting is where Karoa Crescent goes over the hill above the current Karori Tunnel. 'Kaiwharawhara' was rendered as 'Kaiwarra' by early settlers
- 19 Board of Works meeting, 14 April 1867; *Wellington Independent*, 16 May 1967, p5c
- 20 *Wellington Independent*, 16 May 1867, p5b; Aicken costed it at £26,000, excluding £3-£4 to hook up each house. George Aicken, City Engineer, 18227-82, a public works engineer and former Canterbury Provincial Engineer, served a year as Wellington Town Commissioner in the Thorndon Ward, October 1867 – May 1868
- 21 Pseudonym 'Water Supply', *Wellington Independent*, 16 May 1867, p5
- 22 Robert M Marchant (1820-1902), was 'irascible and eccentric'. He had led a mob of labourers in the 1851 Battle of Mickleton Tunnel in Gloucestershire against the railways company (for which his second cousin the railways engineer IK Brunel worked), over a pay dispute. After coming to NZ around 1863, Robert Marchant left an indifferent reputation from his railway projects in Southland, before failing in a similar proposal in Wellington (the railway from Wellington to Upper Hutt). Andrew and Melanie Kelly, *Brunel 200 South West*, on www.swmlac.org.uk/docs; Ferkert, 1953, p219. Nicholas Marchant's Report to Subcommittee Meeting, 13 October 1870, WCC Minutes, 00164:0:1, p8
- 23 Wellington Town Board, 20 December 1867; Wellington Town Board, Board of Works, 17 April 1868; *Wellington Independent*, 18 April 1968, p5; 28 April 1868, p4
- 24 Nicholas Marchant, City Engineer (1836-1907), served as Wellington City Surveyor/Engineer from October 1867 – March 1878, and as well as forming roads, culverting streams and digging drains is principally associated with the Karori water supply. He went into private practice (as an architect and engineer), clients including the Borough of Marton. *NZ Mail*, 31 January 1880, p19c; *Evening Post* advertisement, 4 December 1883, p2. The Marchants appear not to have been related
- 25 RE Offer, *Walls for Water. Pioneer Dam Building in NZ*, Dunmore, 1997, p27
- 26 *Wellington Independent*, 15 and 20 August 1868
- 27 *Wellington Independent*, 19 September 1968, p7; 'The Wellington Water Works Company Limited' was registered on 1 May 1868 for the purpose of "procuring a sufficient supply of water for the City of Wellington", *NZ Gazette*, no 22, 7 May 1868, p200; see also *NZ Mail*, 9 February 1878
- 28 Wellington Town Board meetings, 10 July and 10 September 1869; Marchant's Report, WCC meeting, 13 October 1870, 00164:0:1, p15; Board of Works meeting, 11 February 1870, 00165:0:2, p473
- 29 *Wellington Independent*, 12 February 1870, p5; WCC Water Supply Subcommittee, 3 October 1870, 00164:0:1, p2
- Wellington Gas Co was formed in 1870 and, after importing its equipment and pipes, built the city's first coal-converting gas works in Courtenay Place in 1871
- 30 Water Supply Subcommittee, WCC, 14 October 1870, 00164:0:1, p30; Quote from WCC meeting, 21 October 1870, 00164:0:1, p35. These included the brewer Bannatyne and a soda water manufacturer on Cuba Street
- 31 WCC meeting, 20 October 1870, p33; Marchant's Report, WCC meeting, 10 October 1870, 00164:0:1, p16; City Engineer GA Hart speculated that Beck may have begun the head-works, Speech to the Wellington Philosophical Society, 17 September 1930, file 6/10/1, vol 1, p16, WRC
- 32 WCC meeting, 8 November 1870, p38; WCC meeting 11 November 1870, p40; WCC meeting, 23 December 1872, 00164:0:1, p87, payment made 1 January 1873
- 33 Report of 10 October read to WCC Subcommittee meeting, 13 October 1870, 00164:0:1, p4, Wellington City Archives; WCC, 6 January 1871, p49
- 34 Marchant to WCC, 28 March 1871, H3 1871, *Appendices to the Journals of the House of Representatives*
- 35 City Surveyor's Report, 1871, 0030:1:1, Wellington City Archives
- 36 *NZ Gazette*, no 35, 24 June 1871, p313. This led to the Wellington Waterworks Act 1871 (with amendments in 1874 and 76), authorising the works and a £25,000 loan for them. It appears only 110 acres was taken at this time. 'Plan of Watershed of the Kaiwarawara [sic] Stream to be taken under the Public Works Act by the Wellington City Corporation'. [Plan No.] 15414 [originally 187/16], Thomas Ward Licensed Surveyor, 3 December 1901, WRC
- 37 WCC Waterworks Committee meetings, 2 February 1872, p50; 14 February 1872, 00164:0:1, p52, Wellington City Archives. Short quoted 35s-11-5/6d per 100yds; Judith Burch, *The Karori Reservoir Area. A History*, 1997, p33
- 38 WCC Waterworks Committee meetings, 6 May 1872, 00164:0:1, p62, Wellington City Archives
- 39 WCC Waterworks Committee meetings, 18 January 1873, p91; 24 April 1873, 00164:0:1, p103, Wellington City Archives
- 40 *NZ Mail*, 17 January 1874, 28 February 1874. These accounts of the Aro Valley basin have, in many secondary histories of the Karori waterworks (including the 1995 *Karori Reservoir Heritage Assessment*), been mistakenly thought to refer to the Karori dam. Virtually all correspondence about the Karori dam, and most plans, have not survived, and even details of the city's reticulation pre-1908 are lacking (AK Bristow note, 'Water Supply' volume of WCC notes).
- 41 *NZ Mail*, 28 February 1874
- 42 Nicholas Marchant to Question 36, Legislative Council, 1877, No 15
- 43 *NZ Mail*, 17 January 1874. Tapped somewhere by Polhill Gully Reserve or Holloway Road?; *Wellington Independent*, 24 November 1873, p2e. This was used to water the dusty streets, for which seawater was otherwise used; Burch, 1997, p34
- 44 *NZ Mail*, 17 January 1874.
- 45 *Wellington Independent*, 4 May 1874, p2f
- 46 Marchant received £500, Blackett 100 Guineas, voted by the Water Works Committee on 21 May 1874, WCC Committee Minute Book 1, 00164:0:1, p129, Wellington City Archives
- 47 MP Edward Pearce, second reading Wellington Waterworks Loan Bill 1874, which authorised another £25,000, 29 July 1874, *NZ Parliamentary Debates* Vol XVI, p305. In the Legislative Council, Member George Waterhouse said the first £25,000 had been used "economically to introduce water into the city but... had not been enough to enable them to erect reservoirs of sufficient dimensions to ensure adequate supply of water at all seasons of the year." *NZ Parliamentary Debates*, Vol XVI, p546
- 48 WCC Waterworks Committee meetings, 9 September 1874, WCC Committee Minute Book 1, 00164:0:1, p138; WCC meeting, 13 May 1875, WCC Minute Book 3, 00166:0:1; WCC meeting, 26 October 1876, 00166:0:1, Wellington City Archives
- 49 Offer, 1997, p34
- 50 Blackett Report on the Wellington Waterworks Extension Contract, 30 January 1878, to the first Wellington Waterworks Investigation Committee, *NZ Mail*, 9 February 1878, p15
- 51 *NZ Times*, 25 January 1878, p3b; *Evening Post*, 25 January 1878, p2f
- 52 Blackett's in *NZ Mail*, 9 February 1878, p15
- 53 Census figures 1874 and 1878
- 54 *Cyclopaedia of NZ*, Wellington, 1897, p274. The Reserve Bank CPI Calculator says this is \$12m today
- 55 WCC Minute Book 4, p223, 15 February 1877; *NZ Times*, 5 April 1878
- 56 Margaret Alington, Wellington Regional Committee of NZ Historic Places Trust, *Newsletter*, vol 1 no 1, October 1975, p5
- 57 WCC Minute Book 4, 25 October 1877, p328; WCC Minute Book 4, 25 October 1877, p332; Legislative Council 1877, no 15
- 58 WRC, file 6/10/1, vol 1
- 59 Nicholas Marchant to Question 41, Legislative Council, 1877, no 15
- 60 WCC Meeting Minutes, 18 April 1878
- 61 *Floods in NZ 1920-53*, Soil Conservation & Rivers Control Council, 1957, p133
- 62 Hugh Sinclair had operated the loco since February 1880. 'Skunk or Wainuiomata?', *NZ Railway Observer*, Summer 1999-2000, p142
- 63 Sinclair's Reminiscences, *The Dominion*, 9 January 1914, p6b
- 64 WCC Minutes, 25 July 1878, and Book 5, 10 May 1881, p455; The poll returned 1,099 votes for the Wainuiomata development, and 398 against, *The Dominion*, 9 January 1914, p6b.
- 65 Messrs R Laidlaw & Son cast the pipes (in their Alliance Foundry, Milton Street) which bear the letters 'R L & S', WCC Minute Book 5, 29 January 1880, p258; WCC Minute Book 5, 30 October 1879, p223; WCC Minute Book 5, June 1880, pp317, 310; 16 September 1880, p358
- 66 WCC Minute Book 6, p110 22 June 1882. J&D Sinclair received £8 per acre; WCC Committee Minutes, 28 June 1880, p67; WCC Minute Book 5, 30 Sept 1880, p363

- 67 WCC Minute Book 6, 15 March 1883, p190; WCC Minute Book 6, 11 October 1883, p259
- 68 'Notes on the History of the City of Wellington' uncredited, ca1955, file 6/10/1, vol 1, WRC; The short tunnel was called Coleman's Tunnel, Loughrey to Committee, 19 April 1887, file 6/10/1, vol 1, WRC. The route of the water-race is above the present Reservoir Road. The well is high above where Whitcher Road becomes Reservoir Road, overlooking Richard Prouse Park
- 69 *Evening Post*, 22 October 1883, p2, 23 October 1883, 25 October 1883, 6 November 1883, 4 December 1883
- 70 Loughrey to Waterworks Investigation Committee, 19 April 1887, p6, 7, file 6/10/1, vol 1, WRC
- 71 James D Baird CE (1840-1908) was due to finish his term as City Engineer at the end of 1883, being toasted at a public dinner on 22 December, but remained as Acting City Engineer throughout January 1884. In private practice with Thomas Ward until 1892, but was declared bankrupt in 1889. He died as Menzies Board Engineer, Western Australia. *NZ Mail*, 28 December 1883, p8c; 31 May 1889, p29c; WCC Minute Book 6, 13 March 1884, p320; Furkert, 1953, p102
- 72 *The Dominion*, 9 Jan 1914, p6b
- 73 WCC Minute Book 6, 6 November 1884, p456; ATL Photo G4089 1/2, Halse Coll, shows trees planted by March 1888
- 74 CW Richmond's satirical 'The Wainui Waterworks, by our artist who has NOT visited them'. *The Evening Press*, 1887, ATL B-034-021; In four visits in 1883 councillors drank £9-12-0 of alcohol, *Evening Post*, 4 December 1883
- 75 'Report of the Committee Upon the Water Supply', n.d [ca May 1887], file 6/10/1, vol 1, WRC. The committee commissioned HP Higginson to consult; the newspapers commissioned Nicholas Marchant (see *NZ Mail*, 4 March 1887, Supplement p2c)
- 76 This difference in perception had been established by 1887, see Baird & Ward reply to Higginson, 4 April 1887, in 'Report of the Committee Upon the Water Supply', n.d [1887], file 6/10/1, vol 1, WRC
- 77 Petone Town Board had been formed in 1882 and James Baird advised it on water supply on 12 May 1885 [Furkert, 1953, p102]; the Hutt Town Board formed in 1881 and Nicholas Marchant assessed Lower Hutt's options in 1887 [*NZ Mail*, 8 April 1887, p21e; 10 June 1887 p24d]. In reporting on Marchant's commission, the newspaper called him "one of the ablest hydraulic engineers in NZ."
- 78 WCC meeting, 4 December 1884, WCC Minute Book 6, p465
- 79 *NZ Mail*, 10 June 1887, p23d. Petone's first plan was probably conceived by William Fitzherbert, Hutt County Council's first engineer, 1877-85, who acted for Petone Town Board. Could he have been recommending his own property (if that on Western Hutt Road) as the source of Petone's water? See Daley, 1977, p214, *Cyclopaedia of NZ*, Wellington 1897, p834
- 80 Susan Butterworth, *Petone, A History*, 1988, p132
- 81 RS Rounthwaite, 'City Engineers Report For Three Years Ending 31 March 1902', file 6/10/1, vol 1, p66, WRC
- 82 Offer, pp44, 47
- 83 *First 100 Years – Petone (Pito One) Progress & Prosperity*, Petone Borough Council, 1940, p261; *The Dominion*, 28 July 1930, p6a; The whole matter had to be settled with the Petone Corporation Waterworks Act 1905
- 84 Miller, David P, *Once Upon a Village, a History of Lower Hutt 1819-1965*. NZ University Press/Lower Hutt City Council, 1972, pp109-10, 121-23. Son of JWA Marchant, Fred Marchant was also no relation to Nicholas Marchant [Charles Lawn, *Pioneer Land Surveyors of NZ*, 1977, p182]
- 85 [Lance Hall?] *Lower Hutt Past & Present*, Lower Hutt Borough Council, 1941, p86
- 86 AN Grigg, Engineer to Hutt Valley Underground Water Authority, 'Technical Sub-Committee Report on the Administration of Water Supply & Distribution in the Wellington Region'. Hutt Valley Underground Water Authority, 1967, file 6/10/1, vol 4, WRC
- 87 Bob Meyer, 'Johnsonville's Water Works', pp5-7. Unsources article, n.d, Scott Farrell Collection
- 88 Ann Beaglehole with Alison Carew, *Eastbourne - A History of the Eastern Bays of Wellington Harbour*, Eastbourne Historical Society, 2001, pp87, 123; *The Dominion*, 31 July 1930, 14c.
- 89 Offer, 1997, p38
- 90 Institution of Professional Engineers NZ, Heritage Database website www.ipenz.org.nz/heritage; 'Trentham Military Camp, Water Supply', Public Works Series 1, file 23/103/4, Archives NZ
- 91 'Paekakariki Military Camp, Water Supply. Compensation Claim, LS Smith', Public Works Series 1, file 23/698/1/14, Archives NZ; Daley, 1977, p105
- 92 GM Betts, *Betts on Wellington*, 1970, p37, population as at 1894
- 93 Daley, 1977, App III, p216
- 94 GM Betts, 'A study of Wellington City Council and the part its elected representatives and staff, together with the citizens of Wellington, play in the decision making process'. VUW thesis, Wellington, 1969, 3-vols
- 95 DA Roberts, 'The Water Supply of Wellington', ca1942/43, file 6/10/1, vol 1, WRC
- 96 *Cyclopaedia of NZ*, Wellington, 1897, p749
- 97 Richard Rounthwaite, City Engineer to Mayor, 14 May 1900, file 6/10/1, vol 1, WRC
- 98 Special Waterworks Committee 'Re Water Supply Based on City Engineer's Report, 10 July 1901', file 6/10/1, vol 1, p10, WRC
- 99 Rounthwaite, file 6/10/1, vol 1, p10, WRC
- 100 *NZ Mail*, 31 January 1880, p19c
- 101 Rounthwaite. City Engineer to WCC, 10 November 1900, file 6/10/1, vol 1, WRC
- 102 Rounthwaite, City Engineers Report For Three Years Ending 31 March 1902, file 6/10/1, vol 1, WRC
- 103 Rounthwaite, 31 March 1902, file 6/10/1, vol 1, WRC
- 104 Special Waterworks Committee, '10 July 1901', file 6/10/1, vol 1, p6, WRC
- 105 Rounthwaite to Mayor, 14 May 1900, file 6/10/1, vol 1, WRC
- 106 William H Morton (1866?-1923). He headed off 66 other applicants for the £700 p.a job. He was also instrumental in the development of Wellington tramways. *NZ Mail*, 17 February 1904, p76b
- 107 *The Dominion*, editorial, 18 August 1926, p8b. In 1926 the Town Clerk became CEO
- 108 Roberts, ca1942/43, file 6/10/1, vol 1, WRC
- 109 Poll of Ratepayers was on 12 April 1905. While the poll approved a loan of £190,000, in fact £235,000 was borrowed in 1905 for waterworks, of which £17,000 was 'surplused' and allowed in 1909 to be spent on other urgent water works (reticulation and pipe-bridging). Wellington City Water Supply Loan Diversion Act 1909, NZ Statutes 1909, No 3, 3 December 1909. *Evening Post*, 11 April, p4; 13 April 1905, p5
- 110 *NZ Mail*, 4 July 1906, p62c; *NZ Gazette*, No 32, 7 June 1906, p1425; Plan No 15414, 3 December 1901. In total over 516 acres was taken at this time
- 111 An earlier tenderer, MH Bennett (£23,594-1-10) appears not to have proceeded after being initially accepted. WCC Minute Book 18, 6 September 1906, p482; Mitchell & King's price was £23,990, WCC *Annual Report* 1906/07, p21; 1907/08, p26
- 112 GA Hart, 'The Water Supply of Wellington, Past, Present and Future with Notes Upon the Law of Water'. Paper to Wellington Philosophical Society, Technological Section, n.d [17 Sept 1930], file 6/10/1, vol 2, p12, WRC
- 113 GA Hart [17 Sept 1930], file 6/10/1, vol 2, WRC
- 114 WCC accepted a tender for a steam-engined pumping station on 14 March 1901. WCC Minute Book 14, pp433-434. WCC *Year Book* 1926-27, p135.
- 115 WCC Minute Book 20, 13 October 1908, p255; 5 November 1908, p276; WCC Minute Book 23, 2 November 1911, p60; Contract 538, 'Wainuiomata Reservoir', n.d. List of Contracts, file 6/10/1, vol 1, WRC
- 117 WCC Minute Book 23, 16 November 1911, p74; Offer, 1997, p68
- 118 WCC Minute Book 23, 19 December 1911, p110, Melrose's water will be "turned on in a few days"
- 119 Roberts, 1942/43, file 6/10/1, vol 1, WRC
- 120 WCC *Annual Report*, 1906/07
- 121 Pipes and a river crossing cost £49,016-17-6. List of Contracts, file 6/10/1, vol 1, WRC
- 122 DA Roberts, 'The Water Supply of Wellington', Typescript, *Journal of Royal Sanitation Institute*, n.d. [ca 1942/43], p4; WCC *Year Book*, 1927-28; WCC: Extracts on Water Supply from Annual Reports 1947-1956 (Works Dept File No 50/504/5); Morton 1919 Report, p5; Waterworks engineers measure water levels by hydraulic gradient – the height or 'Head' of the Top Water Level above a certain point, such as Mean Sea Level (9.71m of Head represents 1 Bar of pressure - one 'atmosphere'). Headloss is the reduction in that pressure caused by friction inside the pipe (made worse by encrustation). Old City Datum, used until 1953, set a position 37.96ft below MSL to ensure that all pipes, be they water or drainage, didn't have 'negative head' (flowing uphill)
- 123 Special Waterworks Committee Report, May 1887, p6
- 124 *The Dominion*, 6 February 1915, p8c. The Mayor visited Orongorongo in March, *The Dominion*, 22 March 1915, p7
- 125 *The Dominion*, 17 March 1917, p4; Notes for rainfall and storage levels in 'Brief of Large New Storage Reservoir Wainuiomata...', file 6/10/1, vol 2, WRC
- 126 Morton to Mayor, 17 March 1919, file 6/10/1, vol 2, WRC; Memo to Town Clerk re Orongorongo and Karori Supplies, 8 March 1920, file 6/10/1, vol 3, WRC
- 127 WCC Minute Book 29, 16 September 1920; Notes by AK Bristow, file 6/10/1, vol 2, WRC. The voting paper for this poll was a yard long
- 128 GA Hart, [17 Sept 1930], file 6/10/1, vol 2, WRC
- 129 WCC Minute Book 33, 28 February 1924, p245; WCC *Year Book* 1926-27
- 130 Quote in WCC *Year Book* 1926-27; Semple had the contract to dig both tunnels, for £72,663-6-3, List of WCC Contracts, file 6/10/1, vol 1, WRC
- 131 Dyer and Meyer, 1987, p84
- 132 WCC *Year Book* 1927-28
- 133 Tender of Spiral & Lockbar Steel Pipe Co, Wanganui, of £134,310 accepted. WCC Minute Book 33, 29 January 1924, p200. The lockbar pipes were laid only from the western portal to Wellington
- 134 Ron Bishop, 'Bulk Supply Report', 8 September 1969, file 6/10/1, vol 1, WRC; Morton Memo to Town Clerk, 8 March 1920, file 6/10/1, vol 3, WRC
- 135 Mrs Ryan to McKillop, Waterworks Engineer, 3 August 1930, 'City Water Supply – Wainui-Orongorongo', 00009:795-40/1, pt 1, Wellington City Archives; Mrs Ryan is reputed in local lore to have succumbed to the isolation
- 136 Patrick H Woodgate-Jackson, died 11 Aug 1967. *Evening Post*, 14 August 1967, p1. There was also an accidental shooting of a hunter Doug Muir in the catchment, in the early 1970s, and a subcontractor's death at Te Marua. Barry Castle personal communication, 30 November 2005
- 137 Semple's Track referred to in a 1931 letter by (illegal) trampers in the area, in *Orongorongo Valley History*, Orongorongo Club (Inc) Newsletter, n.d. Semple Tunnel referred to by the Honourable Secretary, Hutt Valley Trampers Club in a letter to the Town Clerk, WCC, 14 March 1933, both Scott Farrell Collection; *NZ Freelance*, 3 December 1952
- 138 *Evening Post*, 16 April 1925
- 139 WCC Minute Book 29, p183, 2 April 1919. Probably stated at Onslow's merger with WCC on 1 April 1919
- 140 Daley, 1977, p43
- 141 *The Dominion*, 20 April 1918, p12; 15 August 1919, p8; Auckland City initiated the information sharing, in 1931. WCC also shared its waterworks knowledge with Christchurch, Palmerston North, Rotorua, Taumarunui, Te Aroha and Whakatane councils. 'City Water Supply – Wainui-Orongorongo', 00009:795-40/1, pt 1, Wellington City Archives
- 142 Report to City Engineer, 29 June 1927 on 'Water Supply to Eastern Harbour Districts', file 6/10/1, vol 2, WRC
- 143 Carmichael, 29 July 1958, file 6/10/1, vol 3, WRC
- 144 WCC *Year Book* 1928-29. Neither Makara County nor Johnsonville Town Board was included
- 145 WCC *Year Book* 1929-30, p121
- 146 WCC Minute Book 37, 9 February 1928, p315
- 147 GA Hart, 'Report of the City Engineer to the Wellington City & Suburban Water Supply Board', 24 July 1929, file 6/10/1, vol 2, p15, WRC. The Whakatikei part was only for low-lying areas in the Hutt Valley
- 148 DSIR *Annual Report*, 1929, pp11-12
- 149 Hart, 24 July 1929, file 6/10/1, vol 2, WRC
- 150 *Evening Post*, 18 March 1930, p11a
- 151 Carmichael, 29 July 1958, file 6/10/1, vol 3, WRC

- 152 *The Dominion*, 19 August 1930, p13d. This Lower Hutt representative was Sir Alexander Roberts. The Chair, Wellington Councillor Morpeth said “You will come back some day.” A Wellington City and Suburban Water Supply Board Amendment Act changed the board’s representation
- 153 *The Dominion*, 31 July 1930, p14b
- 154 Petone Borough Council, ‘Report on Korokoro Sewerage and on Water Supply in the Whole Borough’, October 1976, p24
- 155 Beaglehole/Carew, 2001, pp140-43
- 156 ‘Lower Hutt City Water-Supply Improvement. Loan £160,530’. [1941] extract from report by Dr McLean, Ministry of Health, submitted as evidence into Inquiry into Underground Water, 1957, file 6/10/1, vol 3, WRC
- 157 Dr FM McLean, ‘Lower Hutt City Water Supply Improvement’ Extract, 1941, file 6/10/1, vol 3, WRC; *Lower Hutt Past & Present*, 1941, pp86-87. The Naenae tank job had been interrupted by the war; Miller, 1972, p160
- 158 ‘Report on the Water Supply in the Upper Hutt Valley’, Hutt County Council and Upper Hutt City Council, March 1972. The contractor was MG Templeton, the consulting engineer HF Toogood
- 159 Daley, 1977, pp120, 123, 215
- 160 Grigg, 1967
- 161 Daley, 1977, p185; LS Donnelly Hutt County Engineer to Wainuiomata County Town Committee, with Consulting Engineer KS Odlin’s Report, 30 August 1965, file 6/10/1, vol 5, WRC. The Skerrits Creek supply was shut off in 1965, after considering its treatment
- 162 City Engineer to Town Clerk [but dictated by ER McKillop], 20 September 1938, file 6/10/1, vol 3, WRC
- 163 By Asst Director ER McKillop, ‘Underground Flow of the Hutt River as a Source of Water Supply’, Paper to Wellington Philosophical Society, part 1
- 164 Town Clerk to Mayor, 12 November 1929, ‘Re Recommendations of Special Committee of Water Boards Re Finance’, file 6/10/1, vol 2, WRC; WCC *Year Book* 1930/31, p101
- 165 *Evening Post*, 18 March 1930, p11a; *The Dominion*, 19 August 1930, p13d
- 166 City Engineer’s Report, 19 July 1930, file 6/10/1, vol 2, WRC; The Assistant City Engineer ER McKillop and the Government Geologist sank three test bores at a dam site 1 mile above the Morton Dam. McKillop to City Engineer, 5 July 1930, file 6/10/1, vol 2, WRC. Though this report predates Petone and Lower Hutt’s departure from the Board, their intentions had long been known
- 167 Hart G.A, City Engineers Report, 14 July 1930, file 6/10/1, vol 2, pp15, 17, WRC
- 168 McKillop, ‘Underground Flow...’ paper
- 169 WCC Minute Book 42, 5 October 1931, p213; WCC Minute Book 44, 3 July 1933, p244
- 170 City Engineer to Town Clerk, 9 March 1939, ‘City Water Supply – Wainui-Orongorongo’, 00009:795:40/1, pt 2, Wellington City Archives; *The Dominion*, 16 March 1939
- 171 WCC *Year Book* 1941-46
- 172 Carmichael, 29 July 1958, file 6/10/1, vol 3, WRC
- 173 WCC *Year Book* 1934-36, p96; Plan of Break Pressure Tank, Raroa Road, SM1943, dated November 1934; DA Roberts, *Journal of the Royal Sanitation Institute*, vol 4 no 1, December 1939; it was emptied (by 1940) after a suicide in it. Bob Offer personal communication, 20 October 2005
- 174 WCC Minute Book 47, p37, 14 November 1935
- 175 WCC *Year Book* 1936-38, p77
- 176 WCC Minute Book 56, 24 April 1947, p4; WCC *Year Book*, 1947-50, p54
- 177 Mulgan, 1940, p212
- 178 Hendriksen EE, ‘Wellington Metropolitan Water Supply: Hutt River Scheme’, *NZ Engineering*, 15 January 1956, pp 2-15
- 179 WCC *Year Book* 1947-50, p57
- 180 WCC *Year Book* 1936-38
- 181 J Henderson, Director, DSIR Geological Survey Office to City Engineer, 19 July 1943, file 6/10/1, vol 3, WRC
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- 214 AN Grigg, ‘Technical Subcommittee Report on Administration of Water Supply & Distribution in the Wellington Region’, Hutt Valley Underground Water Authority, 1967, p8
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- 216 Three quotes, City Engineer Thomas to Town Clerk, 2 September 1963, 58/45 ‘In connection with Commission of Enquiry into Reorganisation of Local Government in the Hutt Valley’, file 6/10/1, vol 4, p5, WRC; UK figures from Hutt Valley Underground Water Authority Technical Subcommittee draft report on ‘Future Demand and Supply’, dated 21 January 1967, file 6/10/1, vol 4, p5, WRC
- 217 Young, David, *Our Islands, Our Selves*, Department of Conservation/Ministry for Culture and Heritage, 2004, p197. The Authority was administered by Ministry of Works and Development’s Water & Soil Division and created a ‘fiasco’ by issuing water rights to the Ministry of Works and Development for the Clyde Dam. The situation of one division of the Greater Wellington prosecuting another for breaches of resource consents may be seen in similar light
- 218 *Annual Report of Chief Engineer*, Wellington Regional Waterworks Board, 1974, p2; *Waikanae-Paraparumu Water Supply 20 March 1977*, Wellington Regional Waterworks brochure, David Smith MS, 1977, p32
- 219 The Water Group, *Report of Business Activity*, 2001, p12
- 220 John Morrison interview, 27 October 2005, John started with Wellington Regional Waterworks Board in June 1975, after 10 years’ experience with WCC
- 221 The Wainui 24-inch burst eight times in 1978. *Annual Report of Chief Engineer*, 1978, p8; *Evening Post*, 1 September 1933
- 222 When the 1050mm pipe had been completed to Ngauranga it was “a day of some moment”. *Annual Report of Chief Engineer*, WRC, 1979, p8; John Morrison interview. Cr S Duff turned the cock in 1979
- 223 Vicky Alexander, *Tales from the Swamp*, Ch 15, 35, Wainuiomata Historical Society, 2000; W1 23/659, Archives NZ; *Evening Post*, 29 November 1975; 6 March 1980; *Hutt News*, 9 September 1980; *Valley News*, October 1980
- 224 John Morrison interview, 16 November 2005
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- 226 Greater Wellington Water, *Report of Business Activity*, 2005, Draft
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- 233 Daley, 1977, p149
- 234 Hart, 24 July 1929, file 6/10/1, vol 2, WRC
- 235 *Evening Post*, 4 November 1983
- 236 Notes on water supply taken from WCC Minute Books, compiled by AK Bristow, 1881-1900
- 237 Roberts, 1971; David Smith, MS, p27. Fine-mesh strainer on the OK Main, microstrainer on the Wainuiomata pipe
- 238 Betts, 1970, p121-24; *Bulk Water Supply, Annual Statistics*, 1994, WRC; *The Water Group. Report of Business Activity*, 1999, WRC, p8; *The Water Group. Report of Business Activity*, WRC, 2000, p19; *Petone’s Water Supply*, WRC Brochure [1999]
- 239 The Te Marua Water Storage and Treatment Project, WRC, February 1987
- 240 1989 WRC *Annual Report*; *Bulk Water Supply Annual Report*, WRC, 1990
- 241 Draft *GW Water supply annual report*, 2005, Greater Wellington Regional Council (GW); *Water supply annual report*, 2004, p8, GW
- 242 *The Water Group. Report of Business Activity*, WRC, 1999, p9; 2000, p19
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- 244 *The Morton Dam Decommissioning Open Day, Saturday October 29, 1988*, WRC Booklet; *Morton Dam, Souvenir Booklet*, WRC, 1988
- 245 *Evening Post*, 31 March 1979; 11 June 1979
- 246 *The Water Group. Report of Business Activity*, 1998, pp16, 20, WRC; 1999, p12; The original 1872 tunnel is still in service, from a cross-roads of tunnels under the carpark.
- 247 *Annual Report of Chief Engineer*, Wellington Regional Waterworks Board, 1974, p3; H.OME. *The Water Group. Report of Business Activity*, October 2001, p12, WRC; Capacity was formed in April 2004, following an earlier Facilities Maintenance Contract between the two councils.
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