



REGISTER OF HERITAGE PLACES - ASSESSMENT DOCUMENTATION

11. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE

The criteria adopted by the Heritage Council in November 1996 have been used to determine the cultural heritage significance of the place.

The documentation for this place is based on the heritage assessment completed by Dr Robyn Taylor, Historian, and Fiona Bush, Heritage Consultant, in June 2003, with amendments and/or additions by HCWA staff and the Register Committee.

PRINCIPAL AUSTRALIAN HISTORIC THEME(S)

- 3.8.5 Moving goods and people on land
- 3.11.1 Regulating waterways

HERITAGE COUNCIL OF WESTERN AUSTRALIA THEME(S)

- 109 Environmental change
- 202 Rail and light rail transport

11.1 AESTHETIC VALUE*

Ballarat Bridge, Vasse Floodgates & Wonnerup Floodgates were valued for their contribution to the natural landscape in which they were located. The formal structures of the floodgates and the remnants of the bridge created a visual counterpoint to the low-lying wetlands environment. (Criterion 1.3)

11.2. HISTORIC VALUE

Ballarat Bridge, Vasse Floodgates & Wonnerup Floodgates demonstrated the diversity of land use management in the region from the late nineteenth century. (Criterion 2.1)

Ballarat Bridge was an important part of the infrastructure for the timber industry in Western Australia during the nineteenth and early twentieth centuries and, in 1871, was the first bridge constructed to carry a steam locomotive in the State. (Criterion 2.2)

Vasse Floodgates & Wonnerup Floodgates demonstrated the technical evolution in floodgate design in Western Australia for the management of coastal wetland environments. (Criterion 2.4)

11. 3. SCIENTIFIC VALUE

The construction of *Vasse Floodgates & Wonnerup Floodgates* inadvertently created a freshwater wetland system which has become an important habitat for local and migratory birds. The area received international recognition in 1990 when it was listed under the Ramsar Convention. (Criterion 3.1)

Vasse Floodgates & Wonnerup Floodgates demonstrated the way both coastal wetlands and agricultural areas can be managed through the mechanical control of water levels. (Criterion 3.1)

The records of *Ballarat Bridge, Vasse Floodgates & Wonnerup Floodgates* made at the time of their removal have the potential to yield information about bridge construction during the latter part of the nineteenth and early twentieth centuries and the construction of the early weirs on the Vasse and Wonnerup Estuaries. (Criterion 3.2)

11. 4. SOCIAL VALUE

Vasse Floodgates & Wonnerup Floodgates were important to the local community for the role they played in developing and maintaining viable farmland in the Busselton area, and the modern floodgates that replaced them continue to perform this function. (Criterion 4.2)

The site of *Ballarat Bridge* is valued by the community for its associations with the Ballarat locomotive, the first locomotive used in Western Australia, now on display in Victoria Square, Busselton. (Criterion 4.2)

12. DEGREE OF SIGNIFICANCE

12. 1. RARITY

In comparison with other floodgates constructed in the Busselton district, *Vasse Floodgates & Wonnerup Floodgates* remained in continuous operation from their construction at the beginning of the twentieth century until their removal in 2004. (Criterion 5.1)

Ballarat Bridge was the first railway bridge constructed to carry a steam locomotive in Western Australia. (Criterion 5.1)

12. 2 REPRESENTATIVENESS

Vasse Floodgates & Wonnerup Floodgates were examples of the type of floodgates, built by the Public Works Department during the twentieth century, to control fresh and salt water levels. (Criterion 6.2)

Ballarat Bridge was a representative example of the type of road bridge built by the Public Works Department around the turn of the twentieth century, having been adapted for use as a road bridge using the original rail bridge structure. (Criterion 6.1)

12. 3 CONDITION

In 2004, *Ballarat Bridge* was removed, *Vasse Floodgates* were replaced and *Wonnerup Floodgates* were replaced except for the south abutment and infill wall.

Prior to these changes, *Vasse Floodgates & Wonnerup Floodgates* were in poor condition. The more recent metal components were in fair condition as were the original bearings running across the top of the floodgates. The timber piles that were the superstructure, onto which the floodgate mechanism and stop boards were attached, were in poor condition. The floodgates had been regularly maintained.

Ballarat Bridge was in poor condition. All of the timber elements that made up the bridge had deteriorated to a considerable extent. The timber bearers that were secured on either side of the timber piles were gradually working loose from their fixtures, with some already partially dislodged. Only a few of the bracing timbers, once located below the timber bearers, remained in situ. The timber piles were substantially weathered. No inspection was made of the piles below the water line. The severe extent of deterioration indicated that regular maintenance was not carried out on the structure.

In 2005, the south abutment is in good condition.

12. 4 INTEGRITY

In 2004, *Ballarat Bridge* was removed, *Vasse Floodgates* were replaced and *Wonnerup Floodgates* were replaced except for the south abutment and infill wall.

Prior to these changes, *Vasse Floodgates & Wonnerup Floodgates* continued to be used for the purpose for which they were designed, although they were becoming inefficient due to age and the wearing of the timber components. The sustainability of the floodgates could have only have continued if extensive work had been carried out and the existing timber piles replaced. Although the floodgates had undergone extensive repairs and refits, they had retained a high degree of integrity. The new replacement floodgates fulfil the original structures' function of controlling water flow.

The original form of *Ballarat Bridge* remained intact, despite the loss of the timber decking and its conversion from a rail bridge to a road bridge. However, the bridge lay derelict and unused due to the poor condition of the remaining timbers. The decay of the timber supports made it unlikely that the bridge could be restored thereby jeopardising the long-term sustainability of the structure. *Ballarat Bridge* had a low degree of integrity.

12. 5 AUTHENTICITY

In 2004, *Ballarat Bridge* was removed, *Vasse Floodgates* were replaced and *Wonnerup Floodgates* were replaced except for the south abutment and infill wall. The south abutment has high authenticity.

Prior to these changes, the floodgates had a low degree of authenticity and *Ballarat Bridge* had retained a moderate degree of authenticity.

Vasse Floodgates & Wonnerup Floodgates were extensively repaired in 1929 and the individual floodgates replaced in 1991. New materials were introduced at this time along with the replacement of various components.

Several of the timber piles on *Ballarat Bridge* appeared to date to at least 1896 as they were similar in form to the 1896 plan of the bridge. It is unclear from the 1896 plan how much of the bridge was repaired and what was replaced. Certainly the structure that remained to 2004 was very similar in form to that of the 1896 plans. Taking the evidence of these plans into account, it would appear that a large percentage of the bridge's fabric dated to at least 1896 and possibly to the earlier construction phase of 1871.

13. SUPPORTING EVIDENCE

The documentary evidence has been compiled by Dr Robyn Taylor, Historian. The physical evidence has been compiled by Fiona Bush, Heritage Consultant.

13.1 DOCUMENTARY EVIDENCE

The site previously comprised two sets of floodgates, *Vasse Floodgates* and *Wonnerup Floodgates* (1907/8, replaced 1929), located on the Vasse and Wonnerup estuaries, and remnants of *Ballarat Bridge* (1871, partly replaced or rebuilt c.1896, 1929) located next to *Vasse Floodgate*.

Following the establishment of the Swan River Colony in June 1829, Captain James Stirling authorised a number of expeditions to survey the countryside and coastlines of the new colony. During November 1829, one such party explored the coast between Cockburn Sound and Geographe Bay in the south-west.¹ The following are observations made by two members of the expedition, Mr Collie and Lieutenant Preston of the British Royal Navy, of the Vasse and Wonnerup estuaries which they explored using whale boats.

November 25th. – Left Port Leschenault [Bunbury] at forty-five minutes past 4 a.m., and having rounded the breakers which extend off the head... stood along a sandy beach with frequent rocks at the water's edge, we entered Port Vasse [Wonnerup Inlet] ... through a narrow entrance, with only one foot and three quarters [approx. 0.5 m] of water at low water, but tide flowing, and so indistinct, that had it not been for the pelicans and gulls which were sitting on the beach close by it, we should have had difficulty in perceiving it at a few yards' distance... A short way inside the beach we found the channel again very shallow; also narrow, and the main branch taking a northerly direction, parallel to the beach, and only separated from it by a few sandy knolls; another branch continued past the opening for one or two hundred yards to the southward, and terminated without any communication. The land adjoining, and to the distance of some hundred yards, is an uneven plain, composed of raised and low places, the former being a tolerable mixture of sand and mould, producing some herbs, shrubs, chiefly leguminous, and trees, for the most part septospermi; the latter is covered with rushes, and swampy. ...[we] left Port Vasse at 1 p.m... We had seen smoke in many places a short way beyond, and even close to the beach, between Port Vasse and Port Leschenault, as well as beyond the former in Geographe Bay; and we saw and heard the natives shouting on the beach.²

These wetlands were part of the traditional hunting grounds of the south-west Nyungars of the Wardandi and Pibermun language groups.³ Birds, fish, kangaroos and small marsupials were in plentiful supply during the various seasonal changes.⁴

¹ Cross, J., *Journals of several expeditions made in Western Australia during the years 1829, 1830, 1831, and 1832; under the sanction of the Governor, Sir James Stirling*, published by J. Cross, Holborn, London, 1833, Facsimile edition 1980, UWA Press on behalf of the Royal Western Australian Historical Society (Inc.), p. 45.

² Cross, J., pp. 45 – 46.

³ Busselton Municipal Heritage Inventory, prepared by Hocking Planning and Architecture Pty Ltd., Shire of Busselton, 1993, p. 1.

⁴ Daniel M. de Gand, Anthropologist and Gavin Jackson, Archaeologist, Draft Preliminary Advice of an Aboriginal Heritage Survey of the Proposed Works to Replace the Vasse and

In March 1830, Captain Stirling followed up these explorations by travelling to the south-west and surveying the areas around Geographe Bay and the Blackwood River. He was conscious of the need to find suitable lands for the settlers who were being encouraged to emigrate to the colony with the promise of land grants. At the same time, in March 1830, a number of families arrived on the 'Warrior' to discover most of the grants around the Swan River had been taken. On his return Stirling encouraged these people, the Bussells, Molloyes, Turners and others to sail to the Blackwood and settle in the area that would become known as Augusta. However, conditions there were harsh for the settlers. It was isolated and the heavily timbered country made farming difficult. In 1831, John Bussell, accompanied by surveyor Robert Edwards explored the area around the Vasse and was encouraged by the supplies of fresh water and expanses of pasture for cattle. Land grants were applied for and eventually many of the settlers moved from Augusta to settle around the Vasse and Wonnerup district. They were to be joined by others from the failed Australind settlement. The Bussells built their homestead 'Cattle Chosen' on their grant on the east side of the Vasse River and the Molloyes erected 'Fairlawn' on the west side. The Layman family established their holding at Wonnerup to the east of the Bussells. Eventually a town was established which was gazetted with the name Busselton in 1847.⁵

In 1838-39, Lieutenant H. W. Bunbury, who had earlier planned and surveyed the town of Busselton, visited the Vasse and recorded the following description of the wetlands and river systems.

The river called the Vasse ... is not a stream of any importance, having but a short course and not running throughout the year...The river is fresh during the winter and early part of the summer at Mr Bussell's house [Cattle Chosen], up to which there is plenty of water for boats from the 'B' tree near the beach, but instead of falling into the sea it discharges itself into the more western of the two estuaries, where it is extremely shallow and even quite dry across the summer.'

These two estuaries, which were hitherto very imperfectly known, extend between them about nine or ten miles from E.S.E. to W.N.W., and are divided about half way by what is usually called Wonnerup Island, but it is not entirely surrounded by water except in the wet season or at spring tides...

A considerable portion of the island is low and wet, covered with Samphire and flooded as early in the season as May, but all the remainder, except that part near the sea, consists of good but shallow black earth, resting on a bed of white sand and shells and covered with most luxuriant grass. There is a great abundance of good feed for horses and cattle all about the Wonnerup and the grass appears to me richer and more succulent than in any other part of the Colony I know, making excellent hay and keeping stock fat throughout the summer.

Between the estuaries and the sea runs a belt of land varying in width, of a sandy nature but fertile, bearing luxuriant grass, furze trees and small Peppermints which are the only trees growing very near the sea...

I don't think there is much difference in size between the two estuaries and they are both very shallow in most parts, though there are places where the Natives can cross either of them by wading in the dry season.⁶

Wonnerup Floodgates, Busselton, Western Australia, for WML Consultants and The Water Corporation of WA, February, 2003.

⁵ Jennings, R., *Busselton, "...outstation on the Vasse" 1830 - 1850*, Shire of Busselton, 1983.

⁶ Bunbury, Lt. Col. W. St. Pierre and Morrell, W. P. (eds.) (1930). *Early days in Western Australia, Being the Letters and Journal of Lt. H. W. Bunbury, 21st Fusiliers*, Oxford

Several rivers emptied into these wetlands. The Vasse, Abba, Sabina and New River into the Vasse estuary, while the Ludlow and Capel flowed into the Wonnerup estuary. Each of these is described in Bunbury's account with notes about the vegetation, soils, fish, fowl and nature of the water.

Apart from farming a particularly significant industry for the colony developed around the Geographe Bay area. The commercial harvesting of fine hardwood timbers from the nearby forests began in the late 1840s with the logs being shipped from McGibbon's jetty near Quindalup. As the demand for timber increased its viability as an export commodity was soon recognised by the Colony's new Governor, Frederick Aloysius Weld, who arrived in 1869.

The Jarrah, or Western Australian Mahogany, is only found in this Colony; it is unrivalled for railway sleepers; it is extraordinarily durable; in water it resists the attacks of the Teredo Navalis, and on land those of the white ant. There is a very large demand for it from India and the neighbouring Colonies, which cannot be supplied from want of facilities for conveying the timber from the forests, and for shipping it.⁷

Weld wanted to encourage large-scale development of the State's massive timber resources by replacing the existing system of short-term licenses with long-term leases or concessions that would attract outside investors, in particular from Victoria where considerable wealth had been generated from the goldrushes of the 1850s and 1860s.⁸ Following negotiations with the syndicates involved, three concessions were granted by the Home Office.⁹ Each company had to provide its own mill, railway and port for shipping the timber.¹⁰ The West Australian Timber Company (referred to as the Ballarat Company in one contemporary account)¹¹ was granted a concession of 181,500 acres at Yoganup (now referred to as Yoganup) with its seaport at Lockeville. The other syndicates were the Canning Jarrah Timber Company that was granted a concession on the Canning River where an existing wharf was used, and the Rockingham Jarrah Company's concession at Jarrahdale with its port at Rockingham.¹²

The agreement between the West Australian Timber Company and the government was signed on 29 July, 1871.¹³ John McNeil operated as the company's agent in Western Australia and was based at Lockeville, where he oversaw the construction of the jetty and railway,¹⁴ which would have included the building of the railway bridge over the Vasse estuary in order to

University Press, London. Extracts in Appendix I, 'Management of the Vasse-Wonnerup Wetland System in Relation to Sudden, Mass Fish Deaths', Technical Report, December, 1997.

⁷ Votes and Proceedings, 1870. Transcript of letter dated 13 October, 1869. 'Grants of Land and other Concessions, Cutting and Export of Timber', p. 8.

⁸ *Western Australia, An Atlas of Human Endeavour – 1829 – 1979*, Education and Lands and Surveys Department of WA for the Education Committee, WAY'79, 1979, p. 69. *The Oxford Companion to Australian History*, p. 287.

⁹ Yoganup and Jarrahdale.

¹⁰ *Western Australia, An Atlas of Human Endeavour*, p. 69.

¹¹ Jennings, R., Busselton, "A Place to Remember" 1850 – 1914, Shire of Busselton, 1999, p. 127.

¹² Jarrahdale Heritage Park Conservation Plan, Palassis Architects, January 2002, p. 23.

¹³ W.A. Timber Company. Acc. 541, Item 2749, dated 1884

¹⁴ W.A. Timber Company. Acc. 541, Item 2749, dated 1884.

take the line across to the jetty. To date, no reference has been found for the construction of the railway bridge that carried the rail line across the narrow channel (where the Vasse estuary joins the Wonnerup Inlet) to the jetty.¹⁵ It was a matter of local pride that the Vasse could boast having the first locomotive and railway line in the State. In describing how the mill was progressing, an 'correspondent' in the 21 April 1871 edition of *The Inquirer* remarked:

We are anxiously looking for the arrival of the vessel from Melbourne bringing the locomotive for the W. A. Timber Coy railway. The works are progressing rapidly and it is rumoured and generally believed, that His Excellency the Governor will pay us a visit for the purpose of opening the railway and saw mills on the 1st May. This will be a happy May Day for us and it may be easily imagined that we feel no small satisfaction in having this first railroad of the Colony within our district.¹⁶

Governor Weld officially opened the railway line on 23rd December 1871,¹⁷ while the Jarrahdale-Rockingham line was opened in November 1872.¹⁸ The locomotive was originally named 'Ballaarat' by the Mayor of Melbourne after the original spelling of the town of Ballarat where it was built by James Hunt at the Victoria Foundry (now Phoenix Foundry).¹⁹ 'It had a horsepower of 16 and had two cylinders of 7 inch diameter and a 14 inch stroke. Three wagons without springs were used on the timber train.'²⁰ The timber had been hauled along the rails, originally made of jarrah, by horses before the arrival of the locomotive. Horses and later bullocks continued to be used in conjunction with the engine.²¹

Small settlements developed around the Lockeville and Yoganup mill sites.

The various approaches to the sawmill form a network of railway around the works, and what was but some four months since a dreary waste of sand has now been transformed into a bustling little township with store, boarding houses etc., and very shortly when the mill commences cutting, huts will be erected for the men employed and a nucleus of a future township formed....Yoganup at the head of the line in the timber forest of jarrah has been suddenly called into existence ... Some seventy men are here employed on the Company's works, and substantial boarding houses, where good refreshments can be obtained...Butchers, bakers and nearly all trades find their representatives...²²

At Lockeville, there was an impressive brickstack, 'some 60 feet high' that punctuated the flat landscape; forming 'a most conspicuous landmark, and will be useful for that purpose to shipmasters visiting Geographe Bay.'²³

The 3'6" gauge rail line was to extend 11.5 miles from the jetty at Lockeville to Yoganup.²⁴ The rail line was later extended further into the forest with two other mills built to the east of the railhead at Goodwood and Harrington.²⁵

¹⁵ The bridge would have been privately built by the timber company and according to a 1932 newspaper report, very little was known about the construction of the railway line. *South West News*, Busselton Centenary Number, 08/04/1932.

¹⁶ Jennings, p. 126.

¹⁷ 'Centenary of the State's First Railway', in W.A.G.R. Newsletter, May 1971.

¹⁸ Fall, V. G., *The Sea and the Forest*, Shire of Rockingham, UWA Press, 1972, p. 42.

¹⁹ 'Centenary of the State's First Railway', in W.A.G.R. Newsletter, May 1971.

²⁰ 'Centenary of the State's First Railway', in W.A.G.R. Newsletter, May 1971.

²¹ W.A. Timber Company. Acc. 541, Item 2749, dated 1884. Jesse E. Hammond, *Western Pioneers, The Battle Well Fought*, (1936) Hesperian Press, Carlisle, WA, facsimile edition 1980, p. 64.

²² *The Inquirer*, 21 April, 1871, quoted in Jennings, p. 127.

²³ *The Inquirer*, 21 April, 1871, quoted in Jennings, p. 127.

In 1877, there were reports that the jetty was in a poor state of repair and the locomotive found to be in a dilapidated condition.²⁶ Repairs were undertaken, but by the 1880s the rail line itself needed to be relaid with a 'better class of rail'.²⁷ By 1887, the WA Timber Company was in financial difficulties. In 1888, it was liquidated, the mills closed and the company assets auctioned in Melbourne.²⁸ Because of difficulties relating to the transfer of the timber concession and bureaucratic red tape, the new owners chose not to reopen the mills and the railway was left to rust and the locomotive abandoned at Lockeville.²⁹

In November 1897, the concession was then leased to the English based Jarrah Wood and Saw Mills Co. Because the WA Government Railway had by that time built a line to Busselton (in 1894) the Company only needed to build a private railway line from the Wonnerup siding, following the route of the W. A. Timber Company, thus by-passing Lockeville altogether. The mill was to close down in 1898 when the Government increased the licensing fee.³⁰

The Ballarat steam locomotive had a chequered history after it went out of service. In 1925, after lying derelict for many years, it was transported to Perth for display at the Perth Railway Station then to the Midland Junction Workshops. In 1934, the Busselton Municipal Council requested the return of the locomotive so that it could be exhibited. The locomotive was finally returned in 1937 and mounted in Victoria Square where it stands to this day.³¹

A Public Works Department plan drawing, dated 1896 and titled 'Wonnerup Estuary (Old WA Timber Company's) Bridge, Repairs', indicates the rail bridge had been, or was being, converted into a traffic and pedestrian bridge.³² There are posts and railings marked on the elevation of the bridge, and no signs of rail tracks on the deck plan which is marked as being 16 feet in width. Approach roads curve onto and away from the bridge, very much as they do today. This is inconsistent with the small 'Locality Plan' on the document that must have been reproduced from an earlier map as it shows the rail line travelling in a straight line across the bridge to the jetty. The elevation drawing of the northern abutment on the plan is similar to the structure that exists today.

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- 24 W.A. Timber Company. Acc. 541, Item 2749, dated 1884, Letter dated 9 May, 1877 from Director of Public Works to Colonial Secretary.
- 25 Gunzburg, A. and Austin, J., *Rails Through the Bush: timber and firewood tramways and railway contractors of Western Australia*, Light Railway Research Society of Australia, Melbourne, 1997, p.144.
- 26 W.A. Timber Company. Acc. 541, Item 2749, dated 1884. Letter from Director of Public Works to Colonial Secretary, 4 June, 1877.
- 27 W.A. Timber Company. Acc. 541, Item 2749, dated 1884. Letter from Commissioner of Railways to Colonial Secretary, dated 26 January, 1883.
- 28 Gunzburg and Austin, p.144.
- 29 Gunzburg and Austin, p.144.
- 30 Busselton Municipal Heritage Inventory, Hocking Planning and Architecture Pty. Ltd., p. 6.
- 31 Ballarat Steam Engine, File: Busselton 4/59, National Trust of Australia (WA).
- 32 PWD Plan 4274, Cons. 1647, Item 4274. Plans and sections etc, dated 6 February 1896. State Records Office.

Prior to the installation of the floodgates, every summer and during storm events, the Vasse and Wonnerup estuaries were subject to flooding with seawater. During winter, the estuaries would flood with fresh water from the several rivers that flowed into the low-lying wetlands. This could be alleviated if the mouth of the Wonnerup estuary was kept open, but sand bars would continually form trapping the waters.

The early settlers had been attracted by the supplies of fresh water from the river systems and the lush pastures that enabled a thriving dairy industry to develop. However, it soon became apparent that larger areas of land would be available for farming if the flow of water could be brought under control.³³ Early efforts to control flooding had been undertaken by one of the first settlers, Colonel Molloy, when he excavated Molloy's Ditch to the west of the town of Busselton.³⁴ Apart from flooding, another issue was the unsatisfactory condition of the estuaries during the hot dry summer months when the water levels were much reduced. In 1905, a large number of fish had died in the lower reaches of the Vasse-Wonnerup estuaries causing an unbearable stench.³⁵

In 1907, the government finally acted to assist the farmers.

Some months ago the Public Works Department, to overcome the ever recurring trouble experienced in keeping the mouth of the Wonnerup Estuary open, decided to place two weirs at the inlet near Lockeville. The work proceeded and a few days later was completed. The ultimate object of the weirs was understood to be that of keeping out altogether the salt sea water and so in time freshening the flats along the inlet so that they would be rendered fit for cultivation and at the same time by keeping the tops of the weirs just at the river high mark allow the surplus waters at the time of heavy rains out to sea.³⁶

Plan drawings for the weirs show these were in fact substantial structures, not something that could be completed in a couple of days as suggested in the above article.³⁷ It is possible that the article may refer to temporary rock and earth barriers that may have been built prior to the construction of the weirs.³⁸ Public Works Department plan drawings for the two weirs indicate these formed the main structures that eventually had floodgates fitted, possibly in the following year, that is in 1908.³⁹ The weirs and floodgates were located next to road bridges. *Vasse Floodgate* stands a short distance upstream from the remnants of what is still referred to as the Ballarat Rail Bridge with a row of remnant pylons standing between the two structures. *Wonnerup Floodgate* stands next to the Forrest Beach Road traffic bridge

³³ Jennings, p. 273.

³⁴ Jennings, p. 275.

³⁵ *South-Western News*, 03/02/1905, extract in 'Management of the Vasse-Wonnerup Wetland System in Relation to Sudden, Mass Fish Deaths', December, 1997, Appendix 6.

³⁶ *South-Western News*, 07/06/1907. Extract in Jennings, p. 274.

³⁷ Plan drawings for Stirling Estate Drainage, Weir at Vasse Estuary Bridge, and Weir at Wonnerup Estuary Bridge. PWD 13126 and PWD 13102, dated April 1907. Water Corporation archives.

³⁸ Email communications to Robyn Taylor from Graham Holtfreter, Senior Asset Management Planner, Water Corporation 16/05/2003; and Jim Lane, Chair, Vasse Estuary Technical Working Group, CALM, Busselton, 21/05/2003.

³⁹ Flood gates for weirs at the Vasse Estuary and Wonnerup Estuary bridges, PWD plan drawings, Nos. PWD, WA, 13456 and 13457, April 1907. Water Corporation Reprographics Department, Leederville.

which appears to be a relatively new road bridge. The original Wonnerup Estuary bridge had been built around 1880.⁴⁰

The floodgates operated automatically, as they do now. When the water level is higher on the upstream side the gates swing open and estuary waters discharge. When the level is higher on the downstream side the gates close, preventing the entry of seawater.⁴¹

In the summer of 1909, drainage works were carried out by the government at Quindalup, and Lennox with floodgates installed across Molloy's Ditch.⁴² In 1915, a cut was made to drain water from New River into the ocean so that there was less input into the Vasse,⁴³ then in 1927 the Vasse River and 'most of the Sabina' was diverted direct to the ocean.⁴⁴

During the autumn of 1926, the floodgates were in a poor state of repair and following complaints from the landowners, the Public Works Department carried out inspections.

The Vasse estuary bridge-and-gate structure was reported to be nearing the end of its life and in need of complete renewal within a few years. Leakage was occurring through and around the gates and under the sill. The Wonnerup estuary structure was reported to be in very bad order. Its replacement was also recommended.⁴⁵

No action appears to have been taken with further complaints being made in September the following year requesting urgent repair works. A petition was forwarded to the government complaining about 'much damage to several hundred acres of land', and requesting the sills of the floodgates be lowered by about 15 inches (0.38m) 'which would help reclaim more land, as at present the sill is one foot seven inches above low water which causes unnecessary flooding.'⁴⁶ Eventually ministerial approval was given for the replacement of the floodgates in December 1928 and work was completed in 1929.⁴⁷

Various measures were undertaken to retain higher water levels in the estuaries over the drier summer months. During the 1930s, the bar at the mouth of the Wonnerup Inlet was closed at the end of winter, then in 1942, both sets of floodgates were modified so that stop boards could be incorporated to help retain fresh water in the estuaries.⁴⁸ This practice of installing boards continued up to and during the 1980s, in part to protect the nesting sites of the Black Swans.

Nest and eggs were being flooded when levels rose too high. Introduced foxes were gaining access to nest mounds and their contents when levels fell too low...

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- 40 Extracts from Vasse Report Document compiled by the Vasse Estuary Working Group, p. 1. This extract refers to a file note dated 1919.
- 41 'Management of the Vasse-Wonnerup Wetland System, p. 9.
- 42 Jennings, pp. 274 -275.
- 43 Management of the Vasse-Wonnerup wetland system, p. 4.
- 44 Management of the Vasse-Wonnerup wetland system, p. 12.
- 45 Management of the Vasse-Wonnerup wetland system, p. 9, citing PWD 930/18f 105.
- 46 Management of the Vasse-Wonnerup wetland system, p. 9. Citing PWD 930/18/f107.
- 47 Management of the Vasse-Wonnerup wetland system, p. 10.
- 48 Management of the Vasse-Wonnerup wetland system, p. 13.

This practice was discontinued after four years or so because it proved to be too time consuming.⁴⁹

Apart from continuing complaints by landholders about the impact of flooding and damage to property, the health and maintenance of the flora and fauna of the Vasse-Wonnerup wetlands was seen as a primary concern.

The Vasse-Wonnerup wetlands were listed as a Wetland of International Importance, under the Ramsar Convention, in June 1990.⁵⁰ The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention on Wetlands came into force for Australia on 21 December 1975. Australia has 63 sites designated as Wetlands of International Importance. The Vasse-Wonnerup System (Ramsar site no. 484) is listed as internationally important as a dry season habitat for waterbirds. Up to 33,000 birds have been counted at the site. In winter, broad expanses of open water are fringed by samphire and rushes. *Melaleuca* woodlands occur behind the samphire belt and *Eucalyptus* woodland is found on higher ground. At least 1% of the Australian population of stilt *Himantopus himantopus* and at least 1% of the world population of avocet *Recurvirostra novaehollandiae* use the site in most years.⁵¹

In 1991, major repairs were undertaken to both sets of floodgates in order to extend their use for another ten years.⁵²

In 1992, a report by Sinclair Knight Consulting Engineers indicated the structures were due for replacement.⁵³

After the 1992 report some work was done to strengthen the floodgates pending studies into the overall management and conservation of the wetlands.⁵⁴ From that time, substantial deterioration was reported with leaks occurring where the stainless steel and timber components no longer sealed.⁵⁵

In 1996, *Ballarat Bridge* (listed as the Ballarat Railway Bridge), together with the adjacent *Vasse Floodgate*, was entered on the Shire of Busselton's Municipal Heritage Inventory.⁵⁶ While the bridge is associated with the rail bridge that carried the Ballarat locomotive, local memory of the bridge is its former use as a road and pedestrian bridge.⁵⁷

48. Management of the Vasse-Wonnerup wetland system, p. 10.

50. Management of the Vasse-Wonnerup wetland system, p. 17, and p. 1.

51. <http://www.ramsar.org/>

52. Discussion on site with Graham Holtfreter, Water Corporation, 31/03/2003.

53. Preliminary Design Report, p. 2.

54. Discussion on site with Graham Holtfreter, Water Corporation, 31/03/2003.

55. Preliminary Design Report, p. 2.

56. Place Number 123. The Municipal Inventory was accepted by the Shire Council on 12 June, 1996.

57. Discussions with members of the Busselton Historical Society, 30/03/2003.

A design report for *Vasse Floodgate* and *Wonnerup Floodgates* was completed in June 2002 for the Water Corporation that requested,

A Preliminary Design for the replacement of the existing floodgates to include a remote automated fish release system, a variable height weir, features that will improve Occupational Safety and Health aspects, and to minimise labour intensive and costly methods currently in use.⁵⁸

The report considered various alternative sites for the placement of the new floodgates and concludes that they remain in their current locations 'due to a number of limiting factors of the other positions investigated'.⁵⁹ The report recommended the replacement for *Vasse Floodgate* be constructed immediately downstream of the existing structure which would require the removal of the remnants of *Ballarat Bridge*.⁶⁰ The report had considered the heritage value placed on the bridge and that it was listed on the Shire of Busselton's Municipal Heritage Inventory.⁶¹ The report discussed the ramifications of altering the current location of the floodgates and these included the impact on the local ecology, the fact that the current floodgates are located in existing Road Reserves (thereby negating the need to purchase private lands) and that the relocation of the gates further upstream would require additional gates at the Vasse site due to the width of the estuary.⁶²

A particular area of concern has been the increasing levels of nutrients in the wetlands since settlement due to agricultural fertilisers and animal wastes being washed into the rivers and estuaries. This has resulted in algal blooms, a contributing factor to the incidence of mass fish deaths. A major mass fish death occurred in February 1988.⁶³

The Engineering Heritage Panel by the Western Australian branch of the Institution of Engineers carried out a survey of large timber structures in Western Australia. *Ballarat Bridge* was included in this study where it was referred to as 'Vasse Flood-control Gates and Lockeville Tramway Bridge' (Entry No. 7803).⁶⁴ The results of the survey were published in 1998.

A Wetlands Conservation Strategy was prepared in April 2003 with a summary distributed on the web for public comment.⁶⁵ The floodgates and the management of water levels are recognised in the Strategy document as key issues in the wetlands management process.⁶⁶

⁵⁸ Preliminary Design Report, p. 2.

⁵⁹ Preliminary Design Report, p. 13.

⁶⁰ Preliminary Design Report, p. 13. On-site discussions with Ron McLean, of WML Consultants, Civil, Geotechnical and Structural Engineers, and Graham Holtfreter, Senior Asset Management Planner with Water Corporation, indicated that there were some concerns the remnants of the railway bridge may impact on the new Vasse Floodgate if they were retained but not stabilised.

⁶¹ Place No. 123, Busselton Municipal Heritage Inventory, updated 1998.

⁶² Preliminary Design Report, pp. 17 – 18.

⁶³ Management of the Vasse-Wonnerup wetland system, p. 17, and p. 11.

⁶⁴ Engineering Heritage Panel, W.A. Division, 'Large Timber Structures in Western Australia', Institution of Engineers Australia, 1998, Vol. 4, p. 7803.

⁶⁵ Web site: <http://www.planning.wa.gov.au> Public Comment/Busselton Wetlands Conservation Strategy/Downloadable documents.

⁶⁶ Public Comment/Busselton Wetlands Conservation Strategy, p. 5.

In 2004, *Ballarat Bridge* was removed, *Vasse Floodgates* were replaced and *Wonnerup Floodgates* were replaced except for the south abutment and infill wall (approximately 3 metres). A detailed photographic record for all structures was prepared prior to these works, and the process of their removal and replacement was also documented photographically.⁶⁷ The south abutment is in good condition and has high authenticity.

The Water Corporation proposes to erect commemorative plaques at the place and prepare a detailed proposal for site interpretation. Salvageable materials were collected intended to be used for future site interpretation. A portion of the floodgates has been permanently installed at Busselton Historical Society Museum.⁶⁸

13.2 PHYSICAL EVIDENCE

Site of Ballarat Bridge, Vasse Floodgates & Wonnerup Floodgates (1871, ca.1896), which formerly comprised Ballarat Bridge, a timber structure that was originally built as a railway bridge, *Vasse Floodgates* (c.1907, 1929, 1942, 1991) and *Wonnerup Floodgates* (c.1907, 1929, 1942, 1991), which spanned the Vasse and Wonnerup Estuaries, built by the Public Works Department of Western Australia.

Site of Ballarat Bridge, Vasse Floodgates & Wonnerup Floodgates was located on the eastern side of Busselton on the Vasse and Wonnerup Estuaries. *Vasse Floodgate* was located on the southern side of Layman Road and spanned the Vasse Estuary, directly opposite the northern terminus of Floodgate Road. *Ballarat Bridge* lay on the eastern side of *Vasse Floodgates*. Floodgate Road once crossed the Vasse Estuary at this point, via the bridge, permitting access to Layman Road. *Wonnerup Floodgates* were located next to Forrest Beach Road, approximately 300 metres from Forrest Beach Road's intersection with Layman Road. The floodgates spanned a narrow section of the Wonnerup Estuary where it empties into the Vasse Estuary. A road bridge is located on the northern side of the site of *Wonnerup Floodgates*.

The two floodgates were approximately 1.5 kilometres apart.

The bridge and the floodgates lay in an open grassy area that is frequented by a variety of water birds. The area is apparently marshy during the wet winter months, but during summer is comparatively dry.

On the north eastern side of the site of the floodgates (and bridge), is a low dune system beyond which is Geographe Bay. To the north east of *Vasse Floodgates* is a car park that leads to a public boat ramp. The parking area is equipped with public toilets. A new housing estate is slowly becoming established along the southern side of Floodgate Road.

Ballarat Bridge was a timber structure. The principle supports were timber piles driven into the bed of the Vasse Estuary. These piles were arranged in groups of three across the Vasse Estuary, although some extra piles had

⁶⁷ HCWA file P16727

⁶⁸ *ibid.*

been added, probably at a later date to provide additional support. Nine of these rows spanned the Estuary.

Each row of piles had a pair of sawn timber beams fixed with metal bolts to either side of the piles. These beams ran across the width of the row, near the top of the piles. Timber bracing beams remained in situ across some of the piles. The bracing beams were located beneath the timber stringer and ran diagonally downwards, across the row of three piles and ended near the water line. The original bottom beam was no longer in situ on any of the rows. The timber decking was no longer in situ.

Abutments were still in situ on both banks of the Vasse Estuary. The northern abutment was faced with birdsmouth timber sheeting,⁶⁹ while the southern abutment was faced with horizontal sheeting. Horizontal sheeting is shown in the 1896 plan. The sheeting on both abutments was held in place by large beams running across the width of the abutment and they in turn were held in place by timber piles driven into the bed of the Estuary.

A Telecom cable, in a white polypipe, ran across the top of the timber bearers from one side of the Estuary to the other.

All of the structural elements that make up *Ballarat Bridge* were in poor condition.

The structure for *Vasse Floodgates* consisted of a series of individual floodgates mounted between supporting piles. Each metal floodgate unit was supported on a pair of beams mounted between one pair of piles. The floodgate itself and a timber walkway were supported on the timber cross beams. The gate bearings were mounted on the down-river side of the piles and a walkway was mounted on the up-river side.

The large timber piles were braced with timber poles that extended from the top of the piles to a pile driven into the downstream side of the Estuary. The pile in the river extended just above the surface of the Estuary.

Access to the top of the floodgates was via a timber platform that was approximately 60 cm wide. The timber platform had been covered with a self-contained metal mesh platform that had been fixed to the top of the timber decking. The metal platform was fitted with a tubular metal hand-rail which ran along both sides.

The abutments for *Ballarat Bridge* had been extended across the banks of the Vasse Estuary to stabilise the area at either end of the floodgates.

During the summer months timber stop boards were permanently placed between the piles to assist in excluding salt water. The metal gates were held shut by the weight of the water pressing against them. In the winter months when the Estuary floods, the weight of the floodwater pushed the gates open.

⁶⁹ This sheeting consisted of vertical boards with an arrow shaped notch cut down the length of one side and down the length of the other side the board was cut to form a point. This allowed the boards to fit snugly into the next board when laid vertically. This method was apparently commonly used during the early part of the twentieth century. Information supplied by Geoff Holtfreter during site visit on 31 March 2003. Birdmouthed sheeting is indicated on the 1907 plan drawings.

A single bay of *Vasse Floodgates* was salvaged and stored for interpretative purposes as part of the April 2004 works.

Wonnerup Floodgates were of the same construction as *Vasse Floodgates*, with the exception of four timber piles that had been driven into the Wonnerup Estuary on the upstream side of the gates. Attached to these piles were horizontal beams that extended across to the top of the timber beams that ran across the width of the floodgates. The horizontal beams were held in place with a metal strap.

The abutments on either side of the Wonnerup Estuary were formed from wooden supports and birdsmouth timber sheeting. The southern abutment was retained in the April 2004 works.

The road bridge next to the site of *Wonnerup Floodgates* is also a timber structure and lies on the upstream side of the floodgates. The bridge appears to be of relatively recent construction.

The timber super-structure which supported the floodgates was in poor condition. The piles located in the centre of the estuary had become quite porous, permitting salt water to flow through them into the freshwater side of the estuary. The stop boards, while only in place during the summer months, were in fair condition. The metal floodgates themselves appeared to be in good condition.

In 2005, *Ballarat Bridge*, *Vasse Floodgates* & *Wonnerup Floodgates* were removed, and modern floodgates were constructed on the site where they had been located.

In May 2005, all that remains of the above structures is a three metre section of the southern abutment of Wonnerup Floodgates. However, the replacement floodgates perform the same function as the original floodgates.

13.3 COMPARATIVE INFORMATION

A large number of railway bridges and tramway bridges were constructed in Western Australia since the earliest days of European settlement. Although *Ballarat Bridge* carried the first railway constructed in the state, the bridge that remained to 2004 cannot be said to be unique as it was converted into a road bridge at the end of the nineteenth century. In its 2004 form it was a representative example of the type of road bridge that came to be constructed in the State during the latter part of the nineteenth century and the first half of the twentieth century. A careful analysis of the W.A. Division of the Institution of Engineers' survey of Large Timber Structures shows that *Ballarat Bridge* had many features in common with the bridges listed in the survey, such as the road bridge over the Helena River at Mundaring Weir and the Junction Bridge over Gingin Brook at Neergabby. Both of these bridges show similar elements, such as the horizontal beams attached to timber piles, bracing across the piles and sawn timber stringers, which

were no longer extant on *Ballarat Bridge* in 2004, but which are shown in the 1896 plans.⁷⁰

Settlers in the Busselton/Capel area have been attempting to control the ravages of floodwaters (both fresh and saltwater) since the 1860s when Henry Higgins first dug a 'cut' through coastal sand dunes to assist with the draining of the Capel River.⁷¹ His cut was not particularly successful nor were two later cuts in the 1870s.⁷² A photograph of 'Floodgates at Springfield' is shown in Chase & Krantz's history of the Shire of Capel.⁷³ The photograph shows what appears to be a timber bridge, constructed with vertical timber piles. Attached to the bridge superstructure is a line of vertical timber panels which are fixed at either end of the bridge, leaving a gap in the middle which allows the water to flow through. The floodgates and bridge were built in 1906 and remnants of these structures exist in 2003.

Floodgates were built at Locke's Swamp, to the west of Busselton, in 1923. Construction drawings show four timber gates set above a timber sill, similar in style to those originally built at Vasse and Wonnerup. In 1948, the Locke Swamp Gates were completely re-built, approximately 150 metres to the south of the 1923 gates. The 1948 gates remain in situ and do not appear to have been altered since construction.⁷⁴

Other gates can be found at Stirling Weir (construction date not known) and on the Carbanup River, (to the west of Busselton). The gates on the Carbanup River, known locally as the Lennox River Channel Weir are of wood construction. The style of these floodgates and the weir is not the same as Locke's Swamp or those that were found at Vasse or Wonnerup. Two floodgates are located to one side of the weir and the supports are metal rather than timber piles. Construction date is not known, however the style suggests that they are later than Locke's Swamp Floodgates or those that were at Vasse, Wonnerup.⁷⁵

The presence of other floodgates in the Busselton area indicates that *Vasse Floodgate* and *Wonnerup Floodgate* were not rare in this area, nor were they the oldest surviving gates. Locke's Swamp Floodgates and those on the Carbanup River have a higher degree of authenticity than *Vasse Floodgate* and *Wonnerup Floodgate* had prior to their removal. However, *Vasse Floodgate* and *Wonnerup Floodgate* appear to have been the longest continuously operating floodgates in the Busselton area.

⁷⁰ Engineering Heritage Panel, W.A. Division, 'Large Timber Structures in Western Australia', Institution of Engineers Australia, 1998, Vol. 2, p. 1334 and p. 1354.

⁷¹ Chase, D. & Krantz, V., *Just a Horse Ride Away, a history of the Shire of Capel and its people*, Shire of Capel, 1995, p. 59.

⁷² Chase & Krantz, p. 73.

⁷³ Chase & Krantz, p. 59.

⁷⁴ Information obtained from PWD plans: 22391 (1923) & 31216 (1948) and photographs taken by Rod Sambeek 11/3/2002. Plans and photographs held by the Busselton Office of Water Corp.

⁷⁵ Information taken from photographs taken by Rod Sambeek, Busselton Office of Water Corp.

13. 4 KEY REFERENCES

13. 5 FURTHER RESEARCH

While considerable research time has been spent locating plan drawings, it was not possible to locate plans describing the 1929 upgrade, or replacement of the floodgates. Anecdotal and documentary evidence suggests that the 2004 form of the floodgates occurred at this time. Further research would include locating the 1929 plans for the floodgates to determine what changes were made and the extent of upgrade.

Further investigations also need to be made to locate dated plans of the original *Ballarat Bridge*.