HERITAGE COUNCIL OF WESTERN AUSTRALIA

# REGISTER OF HERITAGE PLACES

**DRAFT – *Register Entry***

**1. DATA BASE No.** 2789

**2. NAME** No. 6 Steam Pumping Station (fmr), Ghooli

FORMER NAME (or OTHER NAMES)

**3. LOCATION** Great Eastern Highway, Ghooli

**4. DESCRIPTION OF PLACE INCLUDED IN THIS ENTRY**

Portion of Lot 350 on Deposited Plan 55290, being portion of Reserve 8230 and part of the land contained in Crown Land Record Volume 3147 Folio 411 as shown on Heritage Council of Western Australia curtilage Map P2789-A.

**5. LOCAL GOVERNMENT AREA** Shire of Yilgarn

**6. CURRENT OWNER**

State of Western Australia – Water Corporation

**7. HERITAGE LISTINGS**

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| • Register of Heritage Places: | Interim | 28/08/1992 |
| • National Trust Classification: | Classified | 15/01/1976 |
| • Town Planning Scheme: | | ---------- |
| • Municipal Inventory: | Adopted | 16/05/1997 |
| • Register of the National Estate: | Permanent | 21/03/197 |
| • Aboriginal Sites Register | | ---------- |

**8. ORDERS UNDER SECTION OF THE ACT**

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**9. HERITAGE AGREEMENT**

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**10. STATEMENT OF SIGNIFICANCE**

*No. 6 Steam Pumping Station (fmr), Ghooli,* an industrial brick building with a corrugated iron roof and a steel chimney, and housing original steam powered

stationary pumping machinery and boilers, associated structures and remnants has cultural heritage significance for the following reasons:

the place was a key element in the first phase of operations of the Goldfields Water Supply Scheme, one of the greatest engineering and infrastructure schemes of the late nineteenth century;

the place, as part of the Goldfields Water Supply Scheme is directly associated with the highly original Western Australian technological innovations in design, engineering and construction which made the Goldfields Water Supply Scheme possible, and so represents a triumph of applied science;

the establishment and operation of the place played a key role in the development of the Wheatbelt region. The supply of water to the Goldfields and the Wheatbelt regions dramatically changed lifestyles and patterns of social, demographic and economic development in Western Australia;

as an industrial building of considerable architectural refinement, the design of the place, as one of the eight similarly designed pumping stations along the Mundaring to Kalgoorlie Pipeline, demonstrates the cultural importance of public engineering works at the time of its construction in reflecting political imagination and ambition;

the place has significant links to engineer Charles Yelverton O'Connor, politician and Premier Sir John Forrest and architect George Temple Poole, who were instrumental in the design and implementation of the construction of the No. 6 Steam Pumping Station at Ghooli and the Mundaring to Kalgoorlie Pipeline;

the place symbolises the scale of the project undertaken by Charles Yelverton O'Connor and the Public Works Department in addressing the critical issue of water supply to the Goldfields, reflecting the importance of gold and the goldfields to the State and national economy at the time;

the place has aesthetic significance as a landmark due to the proximity of the prominent 27 metre tall chimney to the Great Eastern Highway between Perth and Kalgoorlie; and

the place has archaeological potential to inform and communicate its significance and thus improve public understanding of many aspects of the Goldfields Water Supply Scheme, including the construction and operation of the station as well as the lives of the people who lived and worked within the surrounding community.

## 11. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE

Cultural heritage significance means aesthetic, historic, scientific, social or spiritual value for individuals or groups within Western Australia.

In determining cultural heritage significance, the Heritage Council has had regard to the factors in the *Heritage Act 2018* and the indicators adopted on 14 June 2019.

### 11(a) Importance in demonstrating the evolution or pattern of Western Australia's history

*No. 6 Steam Pumping Station (fmr), Ghooli* was a key element in the first phase of operations of the Goldfields Water Supply Scheme, a significant engineering achievement of the late nineteenth century. The whole enterprise was an indication of the importance of gold and the goldfields to the State and national economy at the time. The place symbolises the scale and initiative of the project undertaken by Charles Yelverton O'Connor and the Public Works Department in addressing the critical issue of water supply to the Goldfields.

The Goldfields Water Supply Scheme was the most important engineering and infrastructure scheme of its time in Western Australia and had far reaching consequences for the development of the Eastern Goldfields and the Wheatbelt regions. The establishment of *No. 6 Steam Pumping Station (fmr), Ghooli* and the other seven steam pumping stations, and the provision of water to the regions traversed by the Mundaring to Kalgoorlie pipeline, was a major factor in the development of agriculture, the establishment of railways, and the subsequent rapid development of Western Australia's economy.

The operation of *No. 6 Steam Pumping Station (fmr), Ghooli* and the continued operation of the adjacent Kalgoorlie to Mundaring Pipeline was fundamental in the development of the Southern Cross region and the town of Ghooli as the focus and centre of employment and community life in its immediate vicinity, which shaped local patterns of land use, transport and residence. The supply of water to the Goldfields and the Wheatbelt regions dramatically changed lifestyles and patterns of social, demographic and economic development in Western Australia.

### 11(b) Importance in demonstrating rare, uncommon or endangered aspects of Western Australia's heritage

The original Goldfields Water Supply Scheme has exceptional rarity value as the largest and most ambitious Australian engineering scheme of its time, and exceptional in world terms. *No. 6 Steam Pumping Station (fmr), Ghooli,* was one of the eight purpose-designed pumping stations, and represents an original, collectively unique and individually rare building type.

Each place which forms part of the Goldfields Water Supply Scheme is different and in some degree unique. *No. 6 Steam Pumping Station (fmr), Ghooli* was one of the few places that retained the use of residential facilities for more than 50 years after the changeover to electric pumping.

*No. 6 Steam Pumping Station (fmr), Ghooli* and the surrounding elements, including the sites of the former school, playground and workers' cottages that formed part of the pumping station community, comprise a rare collection of elements that reflect a way of life that no longer exists.

**11(c) Potential to yield information that will contribute to an understanding of Western Australia's history;**

As an archaeological site, *No. 6 Steam Pumping Station (fmr), Ghooli* has potential to provide better public understanding of many aspects of the Goldfields Water Supply Scheme, including the construction and operation of the station as well as the lives of the people who lived and worked within the surrounding community.

**11(d) Its importance in demonstrating the characteristics of a broader class of places;**

The original Goldfields Water Supply Scheme is representative of the ambitious engineering and infrastructure schemes of the late nineteenth century, and was Australia's boldest project to that date. *No. 6 Steam Pumping Station (fmr), Ghooli* is one of eight original steam pumping stations of the Goldfields Water Supply Scheme, and remains representative of pumping stations and their communities in the Wheatbelt.

During its construction and for the fifty-three years of its operation, between 1902 and 1955, *No.6 Pumping Station (fmr), Ghooli* was the focus and centre of employment and community life in its immediate vicinity, shaping local patterns of land use, transport and residence.

As part of the Goldfields Water Supply Scheme, *No. 6 Steam Pumping Station (fmr), Ghooli* is indicative of the social organisation of pumping station communities.

**11(e) Any strong or special meaning it may have for any group or community because of social, cultural or spiritual associations;**

*No. 6 Steam Pumping Station (fmr), Ghooli* has social value for its associations with the Goldfields Water Supply Scheme, a technical achievement dating from the late nineteenth century that is still held in high esteem by the Western Australian community. Although the place is no longer operational, the scheme continues to provide an essential function in Western Australia.

*No. 6 Steam Pumping Station (fmr), Ghooli* was at one time, the focus and centre of employment and community life in its immediate vicinity, which shaped local patterns of land use, transport and residence. A source of employment and water to the Goldfields and the Wheatbelt regions, the place is valued by the towns of Southern Cross and Ghooli.

*No. 6 Steam Pumping Station (fmr), Ghooli* and the surrounding elements, including the sites of the former school, playground, tennis court and workers' cottages, reflect the self-contained nature of the pumping station community at the time, which is valued by the families and workers who lived and worked there.

**11(f)[1] Its importance in exhibiting particular aesthetic characteristics valued by any group or community;**

*No. 6 Steam Pumping Station (fmr), Ghooli* is an industrial building of considerable architectural refinement, reflecting the style of architect George Temple Poole, and the cultural importance of public engineering works at the time of its construction.

The use of decorative elements such as the Romanesque arch to the boiler room, Renaissance style entrance canopy and timber brackets to gable eaves, bulls eye windows and Georgian style cast iron windows are indicative of the social and political importance of the Goldfields Water Supply Scheme to the Western Australian government. This care of detail is supported by other decorative elements within *No. 6 Steam Pumping Station (fmr), Ghooli* such as the elegant cement dressings to window sills and coping to external pilasters. The bulls eye openings have been clearly and finely delineated with tuck pointing, and brick rings, and similar care has been taken with arches to door and window openings.

In its location close to the Great Eastern Highway between Perth and Kalgoorlie, *No. 6 Steam Pumping Station (fmr), Ghooli* has aesthetic significance as a landmark, especially with its prominent 27 metre tall chimney.

The location of *No. 6 Steam Pumping Station (fmr), Ghooli* in close proximity to the both operational buildings and structures such as the Mundaring to Kalgoorlie pipeline, as well as those associated with the pump station community, illustrates the self-contained nature of the Ghooli workers' community throughout the operation of the station.

**11(g) Any special association it may have with the life or work of a person, group or organisation of importance in Western Australia's history;**

*No. 6 Steam Pumping Station (fmr), Ghooli* was purpose built as part of the Goldfields Water Supply Scheme, the most important engineering scheme of its time in Western Australia. It is closely associated with Charles Yelverton O'Connor, as the designer of the scheme, political promoter Sir John Forrest, and respected architect George Temple Poole, each of whom are major figures in Western Australian history.

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1 For consistency, all references to architectural style are taken from Apperly, R., Irving, R., Reynolds, P. *A Pictorial Guide to Identifying Australian Architecture. Styles and Terms from 1788 to the Present,* Angus and Robertson, North Ryde, 1989.

**11(h) Its importance in demonstrating a high degree of creative or technical achievement;**

As part of the Goldfields Water Supply Scheme, *No. 6 Steam Pumping Station (fmr), Ghooli* is testament to late nineteenth century technical design and innovation as one of the largest overland pumping schemes ever attempted to that time. In the context of the surrounding area exhibiting aspects of the technology of hydraulics and agriculture, *No. 6 Steam Pumping Station (fmr), Ghooli* has potential to provide better public understanding of applied science, design, history and regional development.

*No. 6 Steam Pumping Station (fmr), Ghooli* is directly associated with the highly original Australian technological innovations which made Goldfields Water Supply Scheme possible, and so represents a triumph of applied science.

## 12. DEGREE OF SIGNIFICANCE

### 12. 1 CONDITION

*No.6 Pumping Station (fmr), Ghooli* is in very poor condition and in urgent need of conservation to prevent further decay of significant building fabric. Damage is largely due to water ingress through failure of the roof sheeting and the inherent design of the building where the sub-floor of the engine (pump) room is lower than the external ground level. The roof covering to both the pump station building and coal bin structure is showing signs of extreme wear and tear and is in need of replacement due to severe corrosion, and missing and lifting sheets. The rainwater drainage system is in need of a complete overhaul with gutters and downpipes largely missing. Although some of the original machinery and equipment still remain, many parts are missing, and the fabric has deteriorated.

Externally, the brickwork is failing in places with fretting mortar joints and erosion of the brick face, particularly near to ground level. Exposed timber components of bargeboards, fascia and gutter brackets all show signs of decay, damage and are missing in parts. Internal brickwork is suffering from severe erosion and salt attack due to water ingress which is also corroding steelwork lintels, roof trusses and the machinery structure. Windows and doors are either covered with security mesh or boarding with all glazing missing. The concrete floor to the boiler room and passage are covered in mud throughout, and the timber floor boards to the engine room are extensively rotten and damaged. The basement area to the engine room is flooded with most of this water probably coming from the adjacent suction tank via a leaking valve and other water entering from the door to the east. [2]

2 Curtin Institute, 1999, Conservation Plan for Goldfields Water Supply Scheme Volume 2, Place I: No.6 Pumping Station - Ghooli, prepared for the National Trust of Western Australia, p.5.

## 12. 2 INTEGRITY

This section explains the extent to which the fabric is in its original state.

Despite being decomissioned and the inevitable deterioration, *No.6 Pumping Station (fmr), Ghooli* has a high degree of integrity with the building's original form, structure and openings still extant, allowing a clear expression of the original design intent. It has remained relatively unchanged with its integrity able to be preserved by a program of conservation and use of the overall place.

There have been minimal changes to the place with the only items of note being removal of the ablutions block to the west and removal of some of the internal machinery and equipment. As such, the place still has a high level of integrity due to the primary building fabric still remaining in its original state.

## 12. 3 AUTHENTICITY

This section explains the extent to which the original intention is evident, and the compatibility of current use. .

*No.6 Pumping Station (fmr), Ghooli* retains a high degree of authenticity despite the place's closure in 1969. It is almost complete and continues to reflect its historical use, with the original fabric remaining unaltered except in the course of changing work methods during the site's operation.

Despite removal of equipment, the building's primary structure still remains, which allows the original design intent as an industrial building to be readily apparent. The original use as a pumping station would easily be discernible through interpretation. The immediate wider context of the site still functions as an operational pumping site with modern technology and infrastructure that ensures the enduring use of the area and pipeline into the future.

## 13. SUPPORTING EVIDENCE

The documentation for this place is based on the physical heritage assessment completed on behalf of the Department of Planning, Lands and Heritage by Dar Studio, in March 2021, with amendments and/or additions by the Heritage Council and the Department.

The supporting documentation does not aim to give a full history of the Mundaring to Kalgoorlie Pipeline, nor a full description of its components. For further information on the historical context, the construction of the Pipeline and *No. 6 Steam Pumping Station (fmr), Ghooli*, refer to the documents in the Key References in Section 13.4.

## 13. 1 DOCUMENTARY EVIDENCE

Aboriginal History

Located in Ghooli, near Southern Cross, *No. 6 Steam Pumping Station (fmr), Ghooli* falls within the Shire of Yilgarn, which spans both the Wheatbelt and the Goldfields regions. Aboriginal people have occupied Australia for at least 50,000 years. Archaeological evidence indicates that in the goldfields the number of people contracted and expanded over that time in response to the changing environment.[3] The Kaprun people live in Kalgoorlie and South Australia, but are thought to have originated from land between Southern Cross, Coolgardie, Norseman and Kalgoorlie.[4] No Kaprun people now live in the Southern Cross area which is thought to relate to the impact of nineteenth century settlement in the area. Water supplies were scarce in the area, and Kaprun people were captured and tortured to reveal the location of water supplies. During the 1890s gold rush to the region, it is thought that Kaprun people either moved away due to loss of their water supply or from fear of capture and further mistreatment.[5]

Mundaring to Kalgoorlie Pipeline

*The Water Problem*

With the late nineteenth century discoveries of gold in Yilgarn (Southern Cross), Roebourne, the Murchison goldfield and the Coolgardie 'golden mile', an unprecedented number of people flooded into Western Australia. The 1890s gold boom had an enormous impact on the state, with the creation of new towns, the adoption of new architectural styles and massive investment in government infrastructure and amenities.

Water was difficult to source on the goldfields due the arid nature of the area, and this issue was exacerbated by the significant increase in population and the nature of the mining works that were undertaken on a large scale across the area. In addition, a typhoid epidemic, caused by contaminated water, ripped through the goldfields, creating a major health threat that could only be resolved by the provision of a secure uncontaminated water supply.

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3 Government of Western Australia, Western Australian Museum WA Goldfields, Source: http://museum.wa.gov.au/explore/wa-goldfields/, Accessed March 2021.

4 Goldfields Aboriginal Language Centre, Kaalamaya, Source: https://wangka.com.au/kaalamaya/, Accessed March 2021.

5 Ibid.

Fresh water had to be carted in, which highlighted the need for the existing train line to be extended to the Eastern Goldfields. Ironically, the operation of the train in transporting water, also required a large water supply, creating additional shortages and need for the construction of storage tanks and reservoirs.[6]

The government's solution to the 'water problem' was the Goldfields Water Supply Scheme. Championed by Premier John Forrest, and designed—in concert with other experts—by the Chief Engineer, Charles Yelverton O'Connor, the scheme was an ambitious plan to pump water to the Coolgardie goldfields from a coastal source, by way of pumping stations and reservoirs along the route.

*How it worked*

Mundaring Weir represents the start of the Mundaring to Kalgoorlie Pipeline. Water was pumped via a 560 kilometre-long pipeline from Mundaring in the Darling Range to Mount Charlotte Reservoir in Kalgoorlie via a series of pumping stations and reservoirs. The reservoirs served three different purposes, acting as receiving and suction tanks; regulating the flow in the main conduit; and to retain water for service distribution or storage purposes. The original eight steam pump stations used the water in the storage tanks to generate steam to power the engines to further pump water along the pipeline.

The No. 1 Pumping Station at Mundaring pumped water from Mundaring Weir a height of 128.3 metres to the receiving tank at No. 2 Pumping Station in O'Connor. This was then pumped to the Bakers Hill tank, from which the water was gravity fed to the West Northam Regulating Tank and onward to the Cunderdin Reservoir. No. 3 Pumping Station, Cunderdin continued to pump the water on to the remaining Pump Stations and tanks located at No. 4 Merredin, No. 5 Yerbillon, No. 6 Ghooli, No. 7 Gilgai and No. 8 Dedari (Coolgardie), to the final storage reservoir at Mount Charlotte in Kalgoorlie.[7]

The pipeline was designed to follow the railway line to Kalgoorlie (established in 1897) for ease of transport and transfer of materials – and to subsequently supply water to the railway. Where the line deviated it was in response to reducing pressure on the pipe or to shorten distances where possible. Each of the stations between Cunderdin and Dedari were located an even distance apart, which enabled the standardisation of pumps and spare parts.[8] Pump stations Nos 1 to 4 were slightly larger buildings and housed three pumps, while Pump stations Nos 5 to 8 housed two pumps each.[9]

*Completion of the Scheme*

Goldfields Water Supply Scheme was first proposed by Forrest in 1896 and within the same year he had obtained support in the parliament for the Coolgardie

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6 Curtin Institute, 1999, Conservation Plan for Goldfields Water Supply Scheme Volume 1, for the National Trust of Western Australia, pp. 31-37.

7 Six of the original steam pumping stations are still extant, and two have been demolished. Four are on the State Register of Heritage Places. The naming conventions for the stations are not consistent, however the majority are listed on the Historic Heritage database; P1677 *No 1 Pumping Station Museum, Mundaring* (RHP); P8539 No 2 Pumping Station – site of (Demolished); P649 *No 3 Pumping Station* (RHP); P1564 No 4 Steam Pumping Station (No longer accessible); No 5 Steam Pumping Station, Yerbillon (not listed on Historic Heritage database); *No. 6 Steam Pumping Station (fmr), Ghooli,* No. 7 Steam Pumping Station, Gilgai (not listed on Historic Heritage database; Demolished) and No. 8 P5836 *Old Pumping Station* (RHP). P15727 *Mount Charlotte Reservoir* (RHP) and P8538 *Mundaring Weir, Gardens and Village Precinct* (RHP) are also on the State Register

8 Curtin Institute, 1999, Vol 2, Place I, p. 30.

9 The Golden Pipeline, Source: https://www.goldenpipeline.com.au/place/thescheme, Accessed March 2021

Goldfield Water Supply Loan Bill. Despite some opposition to the scheme from the press and parliament, official approval was passed in 1897. Construction of the Mundaring weir and branch line began in early 1898, and the laying of the pipeline began in 1900, followed by the construction of eight pumping stations and reservoirs along the proposed route.[10]

From March 1902, No. 1 Pumping Station in Mundaring started pumping. Operation of the remaining seven pumping stations progressively followed throughout the year, including *No. 6 Steam Pumping Station (fmr), Ghooli* in November and No. 8 Pumping Station, Dedari near Coolgardie in December.[11]

*Immediate and long-term impacts*

The Mundaring to Kalgoorlie Pipeline, also known as the Goldfield Water Supply Scheme and the Golden Pipeline, was fundamental to the continued success of the goldmining industry in Western Australia.

The official opening of the scheme at Mount Charlotte Reservoir in January 1903, also demonstrated the shift from Coolgardie to Kalgoorlie as the mining centre of the region.[12] As gold production declined in the 1910s, larger mining companies concentrated on deeper level extraction. At the same time, the construction of the pipeline facilitated a boom in wheat and hay production along the previously underutilised band of land extending from Northam to Coolgardie.[13] This reflected Forrest's original intent that the scheme 'bring unoccupied land into use'.[14]

In the 1930s, continued leaks to the system required an innovative solution. The refurbishment of the pipeline in 1933, to lift it out of the ground and re-lay it above ground, was a major technical development placing the scheme among the world leaders in pipeline technology for the second time in less than 40 years. The improvements to the pipeline in the 1930s also provided an essential source of labour during the Depression.

In the 1950s, the scheme was electrified and the majority of the original eight Steam Pumping stations became redundant as they became replaced with electrically powered stations. The majority, including *No. 6 Steam Pumping Station (fmr), Ghooli* are still extant. Another substantial upgrade of the original 30 inch (76 cm) pipe line was also undertaken in the 1950s. Extensions to surrounding regions were also installed via branchlines to the main conduit under the Comprehensive Water Scheme.

The Mundaring to Kalgoorlie Pipeline continues to be the main supply for the Goldfields region and the surrounding agricultural areas along its extent.

<u>Ghooli Pumping Station</u>

The location for each pumping station along the proposed pipeline route were finalised between December 1900 and April 1901. Where possible, engineers

10 Curtin Institute, 1999, Vol.1, pp. 44-49.

11 Curtin Institute, 1999, Vol.1, pp. 57.

12 Originally the GWWS was known as the Coolgardie scheme, and the intent was that the pipe line would end there, reflecting the importance of the town as the mining centre. However as early as 1896 it was recognised that extension to Kalgoorlie might be prudent. Curtin Institute, 1999, Vol.1, pp. 29, 47

13 Curtin Institute, 1999, Vol.1, pp. 29, 63.

14 Webb, Martyn and Webb, Audrey 1993, *Golden Destiny: the centenary history of Kalgoorlie-Boulder and the Eastern Goldfields of Boulder WA*, City of Kalgoorlie., p. 439, cited in Curtin Institute, 1999, Vol.1, p. 63

sought to equalise the lifts between the stations, which enabled the standardisation of pumps and spare parts. The choice of location for *No. 6 Steam Pumping Station (fmr), Ghooli* was based therefore in part on its proximity to the adjacent No. 5 Pumping Station at Yerbillon as well as the railway for delivery of building materials and machinery. Other considerations included appropriate conditions for construction of the pumping station building, suction tank and other ancillary buildings.[15]

The pump station building was built as a minor variation on the standard plan developed by the Public Works Department and George Temple Poole. Although the former Principal Architect for Western Australia had retired to private practice, he was engaged as a consultant on the pumping stations. As an industrial building of considerable architectural refinement, *No. 6 Steam Pumping Station (fmr), Ghooli* reflects Temple Poole's eclectic and distinctive style and was intended to demonstrate the importance and ambition of the Goldfields Water Supply Scheme.[16]

The pumping of water along the pipeline began at the No. 1 station in Mundaring on 31 March 1902, with water reaching Northam on 18 April. It progressively moved through Cunderdin, Merredin, Yerbillon and Southern Cross, reaching *No. 6 Steam Pumping Station (fmr), Ghooli* in November 1902.[17]

Once operational, *No. 6 Steam Pumping Station (fmr), Ghooli* required constant upgrades and maintenance.[18] General inspections were carried out each year and major inspections every seven or ten years. Inspections required the large scale removal of elements, including—in the case of the boilers—portions of internal brick walls. Removed items were then reused or replaced, with the defunct materials dumped on the rubbish tip across the Great Eastern Highway.[19] The original brick-lined steel chimney was replaced by the existing structure between 1913 and 1914 due to internal corrosion.[20]

Each pump station required a 24 hour work force, necessitating the construction of settlements in close proximity to the stations for a workforce of engineers, engine drivers, stokers and greasers. A 1903 plan for *No. 6 Steam Pumping Station (fmr), Ghooli* shows the establishment of six lots to the west of the pump building, facing the pipeline, with the construction of three buildings. Two engineers' quarters were located in the two lots closest to the pump building, while the barracks building was located in the western-most lot. As the workforce grew, additional dwellings were constructed. By 1910 the pump station reserve was extended to allow for additional housing. At its height the community comprised ten houses.[21] None of the original dwellings remain.

A school was established to the east of *No. 6 Steam Pumping Station (fmr), Ghooli* for the station community children. The building has since been demolished,

15 Curtin Institute, 1999, Vol. 2, Place I, p. 30.
16 Curtin Institute, 1999, Vol 2, Place I, pp. 32-33.
17 Curtin Institute, 1999, Vol.1, p. 57.
18 Curtin Institute, 1999, Vol.1, p. 68.
19 Curtin Institute, 1999, Vol 2, Place I, p. 36.
20 Curtin Institute, 1999, Vol 2, Place I, p. 49.
21 Curtin Institute, 1999, Vol 2, Place I, pp. 31, 41, 49

although remnants were still extant in 2013.[22] A tennis court and a children's playground was also constructed, to the west of the pump station building. The 1999 Conservation Plan for the place suggests the community children also used the rubbish dump located across the Great Eastern Highway as a play area.

> While containing the usual interesting complement of household and industrial refuse this dump is unique for the use children have made of the remains of steel chimney sections. Signs, such as 'toilet', 'sick bay' and 'cubby' (sic) painted on a number of these indicates that this was a lively place of play and imagination.[23]

Interpretation panels are placed around the *No. 6 Steam Pumping Station (fmr), Ghooli* site as part of the Golden Pipeline Heritage Trail. In addition to information on the operation of the station, the photographs and personal recollections from the pump station community, demonstrate the importance of the community for its members and their descendants.

Between 1926 and 1941 an experimental farm was established between Southern Cross and *No. 6 Steam Pumping Station (fmr), Ghooli.* The aim of the Yilgarn State Farm was to investigate the feasibility of wheat production at the boundaries of the current extent.[24] Some workers associated with the farm were also accommodated within the Ghooli pump reserve.

During World War II, the importance of maintaining the supply of water to the Eastern Goldfields and the Wheatbelt was such that the pump stations were guarded from potential attack. In Ghooli, this role was undertaken by locals from the nearby town of Southern Cross.[25]

In April 1953, electricity was installed at the *No. 6 Steam Pumping Station (fmr), Ghooli.* Following the conversion from steam power to electricity the station continued operation until 1969 when it was replaced by the pump station constructed to the north nearer to the pipeline conduit.[26]

The need for personnel on site along the pipeline ceased with the closure of the steam station. At Ghooli, three asbestos timber cottages had been constructed on the site in the 1950s to replace the earlier housing, which had been removed. Originally used by Agricultural Department employees, the buildings were later used by Goldfields Water Supply employees.[27] These remained in use intermittently until the mid-2000s. By 2017 they were in a dilapidated state.

When *No. 6 Steam Pumping Station (fmr), Ghooli* closed, all machinery and equipment was left in situ. However due to theft, vandalism and repeated flooding, by 1999 the original boilers, economizers, and air pumps were no longer completely intact and most exhibited signs of damage and corrosion.[28] An archival record and condition report was prepared for the site in 2014 by the National Trust of Western

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22 National Trust of Western Australia, 2014, Archival Record, p. 3

23 Curtin Institute, 1999, Vol 2, Place I, p. 31.

24 The Golden Pipeline, Ghooli, Source: https://www.goldenpipeline.com.au/place/ghooli/, Accessed March 2021

25 The Golden Pipeline, No.6 Pump Station, Source: https://www.goldenpipeline.com.au/place/no-6-pump-station/, Accessed March 2021

26 Curtin Institute, 1999, Vol 2, Place I, p. 49; National Trust of Western Australia, 2014, Archival Record, p. 1.

27 Curtin Institute, 1999, Vol 2, Place I, pp. 29, 49.

28 Curtin Institute, 1999, Vol 2, Place I, p. 35.

Australia, which noted continued flooding, damage and corrosion to the internal and external elements of the place.[29]

In 2016, the presence of asbestos containing material within the main pump building was identified at *No. 6 Steam Pumping Station, Ghooli.* A 2017 assessment of the three former workers cottages located to the west of *No. 6 Steam Pumping Station (fmr), Ghooli* noted their poor condition, and confirmed they also contained asbestos and were proposed for demolition.

In 2021, *No. 6 Steam Pumping Station (fmr), Ghooli* remains closed due to potential asbestos contamination. The adjacent workers cottages are still extant, although in poor condition.

Heritage Value

In 1992, *No. 6 Steam Pumping Station (fmr), Ghooli* was entered in the State Register of Heritage Places. In 2005, the Mundaring to Kalgoorlie Pipeline, including *No. 6 Steam Pumping Station (fmr), Ghooli* and the other sites of steam pumping stations, reservoirs and holding tanks and portions of pipeline conduit, was placed on the Heritage Council of Western Australia's Assessment Program.

In 2011, the Goldfields Water Supply Scheme was listed on the National Heritage List in recognition of the outstanding heritage value of the place to Australia. The sites of the original eight steam pumping stations, including *No. 6 Steam Pumping Station (fmr), Ghooli,* were included within the definition of the place.[30]

## 13. 2 PHYSICAL EVIDENCE

*No.6 Pumping Station (fmr), Ghooli* is one of eight original pumping stations located along the Goldfields Water Supply Scheme that pumped water from Mundaring Weir to Kalgoorlie. Constructed between 1901 and 1902, it is of brickwork masonry construction with a pitched roof of corrugated iron sheeting. There is an adjacent coal bin shelter structure with a railway formation to the south and a dominant tall steel chimney to the west. The building is a simple functional structure designed by the Public Works Department with the involvement of architect George Temple Poole.

The place is not readily categorised into a particular architectural style but does display characteristics of a utilitarian industrial structure built in the federation era of load bearing walls and brickwork piers. There are also affinities with Romanesque architecture with the detail of arched and circular openings, Renaissance style entrance canopy and timber eaves brackets, and Georgian style cast iron windows.[31] With standardisation being a guiding principle, the design and layout is similar to other pump stations along the pipeline consisting of open volume spaces of a boiler and engine room separated by a passage.

Since its closure in 1969, the place has remained unutilised and is currently identified as a contaminated site with presence of asbestos. As a consequence, the site has been made secure to prevent access with a perimeter security fence

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29 National Trust of Western Australia, 2014, Archival Record; Appendix D, No 6 Pump Station Condition Report, January 2014.

30 Department of Agriculture, Water and the Environment, National Heritage Places - Goldfields Water Supply Scheme Gazettal Notice, Source:https://www.environment.gov.au/system/files/pages/72f536d0-007a-4d75-978b-eb7dca71fef9/files/1060075.pdf, Accessed March 2021.

31 Curtin Institute, 1999, Vol 2, Place I, p.33.

preventing internal and close inspection. Outside of the security fence, in relatively close proximity, there are many remnant structures and features associated with the history of the place. There are also some modern utility structures used by the Water Corporation, as the area continues to be an operational pumping site.

**Siting**

*No.6 Pumping Station (fmr), Ghooli* is located approximately 11.5 km east of Southern Cross along the Great Eastern Highway, and at the 342 km mark from Mundaring Weir along the pipeline track. Its proximity to the highway has ensured the pumping station and its community have been one of the more visible of the remote pipeline places. The location of the pump station was determined by closeness to the railway line for the delivery of building materials, machinery parts and fuel. Local geological conditions and to a large degree the lift from the pump station at Yerbillon and the desire to equalise, as far as possible the lift between stations were also key considerations.[32]

When approaching from either direction along the highway, the tall steel chimney is a dominant feature in an otherwise unremarkable flat landscape of tracks, small trees and bushes. The main access to the site is north of the Great Eastern Highway via a short track, which branches to the east towards the pump station and coal bin.

The surrounding context contains many notable features including the original rectangular suction tank directly adjacent to the north. This is still in operation and is a raised concrete structure supported by earth battered retaining walls to all four sides with a pitched metal roof covering to reduce evaporation and contamination. Immediately to the west of the pump station is a weighbridge constructed in 1948, which is slightly skewed from alignment with the approach road to allow the wood trucks to enter the coal bin. The weighbridge itself is a small brick building with asbestos sheet roofing and a steel floor plate platform over a concrete lined pit.

To the west of the pump station along the access track are remnants of an old children's playground with play equipment and a barely identifiable tennis court. These were important amenity facilities for the community and present a small but somewhat poignant reference into the lives of people who lived and worked on the site. Further along to the west are the housing lots used to accommodate the workforce and their families, which run parallel to the pipeline itself. Three houses remain which are all derelict and in a very poor and deteriorating condition. To the north of the house boundaries is the current pipeline on which lies the modern electric pump station building and an above ground circular water tank; both in operation by the Water Corporation.

Although no visual evidence remains, to the east of the pump station is the site of the former school built for the station's community children. Further past this area is an occupied modern house and associated outbuildings with no connection to the operation of the pump station site. [33]

Directly across the highway and to the south of the pump station are the former rubbish tips and ash dumps. These areas are of particular archaeological importance due to the nature of the operational use of the pump station where

32 Curtin Institute, 1999, Vol 2, Place I, p.29.

33 Curtin Institute, 1999, Vol 2, Place I, p.30.

constant inspection and maintenance led to a lot of repairs and replacement of tools and components that in turn created a number of dumping sites.

**External**

*No.6 Pumping Station (fmr), Ghooli* is a rectangular masonry building of approximately two to three stories in height orientated in an east to west direction along its length. The roof is of galvanised iron sheeting of relatively shallow pitch with a central ridge running along this axis. The roof sheeting is fixed to timber purlins, which are supported on steel trusses spanning the north and south walls on internal brickwork piers. Walls are of solid brickwork construction in English bond with lime mortar pointing. The bricks are marked CPB (Coolgardie Pressed Bricks) with anecdotal evidence suggesting that these bricks are made from gold bearing clay and contain a very small percentage of gold.[34] The colour and tone of the brickwork is notably of a light hue in comparison to the use of the more red colour brick prevalent at the time of construction.

All elevations display a composition of various arched door and window openings with decorative dressed sills, and bull's eye windows delineated with a combination of two and three course brick rings. Of particular note is the subtle detail of tuck-pointing to window and door surrounds. The steel chimney on the west elevation is a prominent landmark and an important focal point in the locality. Other notable features of the external presentation include the round ventilator and two square louvre ventilators to the roof. The building is also characterised by deep overhanging eaves with scalloped timber brackets to the east and west gables.

The north facade of the building sits tight up against the incline of the earth retaining wall of the adjacent suction tank. As such, this part of the building is viewed at oblique angles or from the top of an embankment. It is also largely obscured to the western end by a large example of the invasive Pepper tree[35]. The elevation is centred on an arched entrance with a flat concrete canopy and supporting decorative brackets. The canopy is in a poor condition with spalling concrete that is exposing corroding steel reinforcement bars. Located to the outside of the building at ground level are the brickwork blow off pits used for blowing steam off from the boilers and the control valve pit with connecting suction outlet pipes penetrating through two low level bull's eye window openings. At mid level up the façade, there are five bull's eye windows with 9-pane cast iron frame fenestration; these are all boarded up with the glazing either missing or damaged. There are three rectangular cast iron frame windows at low level with 18-pane fenestration. These all have missing glazing and covered with a security screen. Towards the western end of the elevation there are two timber louvre windows. There are two remaining steel rainwater pipes to the elevation with missing connections to the gutter; the lower sections are cast iron. There are a series of wall vents to the top of the wall, a few courses down from the roof eaves. The ends of the steel truss form the deep overhang to the eaves and are showing signs of corrosion. The brickwork is built up around each of the steel trusses with a painted timber coving running above that abuts the underside of the roof sheets. A painted timber fascia sits on the edge of the steel trusses and is deteriorating rapidly with an ogee profile

34 Curtin Institute, 1999, Vol 2, Place I, p.32.

35 *Schinus molle var. areira* – Flora Base, Western Australian Flora, Source: https://florabase.dpaw.wa.gov.au/browse/profile/17056, Accessed March 2021.

steel gutter almost non-existent with small remains loosely hanging off.

The east elevation is a gable wall of symmetrical design with two brickwork buttresses with decorative copings either side of the central ridge line. The elevation is characterised by a large arched cast iron window at high level to the centre of the façade, which has a 49-pane fenestration. All the glazing is missing with the window boarded up from the inside. Below this window is an arched doorway currently boarded up that provides access to the engine room. A ramp leads down to this entrance, which is blocked by a fallen dead tree. A notable feature to the elevation is also the deep overhanging eaves with decorative timber scroll brackets supporting the roof purlins and sheeting. A painted timber bargeboard finishes the edge of this gable detail, which is missing to the southern section. There are a series of wall vents at high and low level of the façade. A large tree is in close proximity to this elevation at the north-east corner of the building.

The south elevation has three rectangular arched cast iron windows with 18-pane fenestration, which are all currently boarded up from the outside. Immediately above is a bull's eye window to each opening, which are boarded up with a 9-pane cast iron frame fenestration behind. Another bull's eye window exists at lower level that doesn't appear to align with any other openings. The overhanging eaves detail and rainwater drainage system is the same as per the north elevation and in a similar condition. One of the most prominent features of the elevation is the arched entrance into the boiler room that is more than half the height of the wall. This has large steel plates bolted to the east side of the opening to provide protection from wood trucks.[36] There are also eight small square openings for removing connecting rods to the pumps and two openings to the engine room.

The coal bin structure directly abuts the western half of the south elevation, which was also referred to as the coal bunker or the coal pit and latterly as the wood bin. The area was used to shelter fuel deliveries outside of the large archway to the boiler room and is covered with iron roof sheeting supported on a steel truss and timber purlin structure. The enclosure of the coal bin to the south is framed with large timber members that support the roof and utilises large tree trunks as columns. The area is open to the east and west sides and clad with iron sheeting to the south. The remaining portion of the timber trestle structure and remnant railway formation describes the delivery of fuel by rail before this was changed in 1948 to motor vehicle.

The west elevation is of similar detail to the east being a gable end of the building with overhanging eaves and brickwork buttresses. There are two rectangular arched cast iron windows with 36-pane fenestration symmetrically centred either side of the ridge line. These windows are not boarded up with glazing broken and missing. There is a boarded up arched doorway to the boiler room at the southern end of the elevation, which was probably used to remove ash from the boilers and flues. [37] At ground level to the northern end there is the remains of a concrete pad in the location of the former ablutions block. This structure is no longer extant but there is marks left by the roof flashing of the lean-to roof visible in the brickwork.

36 Curtin Institute, 1999, Vol 2, Place I, p.2.

37 Curtin Institute, 1999, Vol 2, Place I, p.34.

The chimney is located directly in front of the west elevation and is 1.2m in diameter and 27m high made from welded steel plates set in a cast iron base plate. [38] The chimney is supported at the top by four steel cables connected to turnbuckles secured into the ground. The chimney is lined with firebricks and connected to the economiser in the boiler room via a deteriorated brick vaulted flue. There is corrosion to the steel plates, cables and supporting accessories.

**Internal**

*No.6 Pumping Station (fmr), Ghooli* is rectangular in plan and a simple two room structure consisting of a boiler room to the west and engine (pump) room to the east separated by a central passageway. These major spaces have well-proportioned volumes, which as a background for the machinery, exhibit distinction and power. [39] There are a series of brickwork piers to the longer north and south sides of the building that support a series of steel roof trusses. The boiler room has two sets of boilers and one economiser with corresponding pumps located in the adjacent engine room. The building has been the target of theft and vandalism since it was shut down and the machinery and equipment have been extensively damaged and numerous parts are missing.[40]

During the 2021 site inspection it was not possible to access the interior of the building due to asbestos contamination. The following summary is based on the information available in the 1999 Conservation Plan and the 2014 Archival Record prepared by the National Trust of Western Australia[41].

The boiler room has a concrete floor and fair-faced brickwork walls with painted finish; white to dado level and silver above. There are also traces of light blue, green, blue and brown paints. Two Babcock Wilcox boilers remain with terracotta and firebrick casings and associated pipework. There is no ceiling with the underside of the roof sheets and trusses visible. Exposed metal surfaces of the boilers are coated with white asbestos mixed with fireclay. Pipework is also lagged with asbestos.

The engine room contains two Worthington triple expansion steam driven pumps and associated machinery, tanks and piping; some of which is lagged with asbestos. Overhead travelling gantry span between the north and south walls supported on piers and corbelled brickwork holding a timber plate and metal rail. The ceiling is asbestos composite board fixed to battens with the steel trusses exposed. The floor is of suspended construction with tongue and groove floor boards on steel joists supported on cast iron columns. The basement area underneath has concrete floor and walls with access via two sets of cast iron steps.

The passageway contains remains of a small office to the southern end. The area is the same materiality and condition of the adjacent boiler room with concrete floor, painted brickwork walls and exposed roof structure.

38 Curtin Institute, 1999, Vol 2, Place I, p.5

39 Curtin Institute, 1999, Vol 2, Place I, p.33

40 National Trust of Western Australia, 2014, Archival Record; Appendix D, No 6 Pump Station Condition Report, January 2014, p.3.

41 Curtin Institute, 1999, Vol 2, Place I; National Trust of Western Australia, 2014, Archival Record; Appendix D, No 6 Pump Station Condition Report, January 2014.

## 13. 3 COMPARATIVE INFORMATION

### Principal Australian Historic Theme(s)

- 2.2 Adapting to diverse environments
- 3.4.5 Utilising natural resources
- 3.5.3 Developing agricultural industries
- 3.11.5 Establishing water supplies
- 3.14.1 Building to suit Australian conditions
- 3.14.2 Using Australian materials in construction
- 3.16 Strugging with remoteness, hardship and failure
- 3.2 Supplying urban services (water)

### Heritage Council of Western Australia Theme(s)

106 Workers
107 Settlements
108 Government Policy
507 Water, power, major transport routes
604 Innovators

### Comparative Analysis

*No. 6 Steam Pumping Station (fmr), Ghooli* was constructed in 1901 to 1902 as one of the eight original steam pumping stations designed as part of the Goldfields Water Supply Scheme. As one of the greatest engineering and infrastructure schemes of the late nineteenth century, there are few comparative schemes or places in Australia.

*Steam Pumping Stations*

The pumping stations of the Goldfields Water Supply Scheme were purpose-designed and thus are a building type unique to Western Australia. Of the eight pumping stations built as minor variations to a standard plan, four including *No. 6 Steam Pumping Station (fmr), Ghooli*, are on the State Register of Heritage Places. Of the remaining four, two have been demolished. All eight sites form part of the Golden Pipeline Heritage Trail promoted by the National Trust of Western Australia.

- P649 *No. 3 Pumping Station* (RHP) at Cunderdin, and P1677 *No. 1 Pumping Station Museum* (RHP) in Mundaring are the most intact examples, and both are currently used as museums. Both are able to provide information about the type of place, original design and function and are the only two stations with brick chimneys.
- P583 *Old Pumping Station* (RHP) in Coolgardie, also known as No. 8 Pumping Station, Dedari, was the last of the steam pumping stations, built in 1901, and continued to operate until 1970. It has recently undergone asbestos remediation works and is not open to the public. A former workers cottage associated with the station is located in close proximity[42].

P8539 No 2 Pumping Station – site of and No. 7 Steam Pumping Station, Gilgai, which is not included in the Historic Heritage database, have both been demolished. The sites may have archaeological potential to provide information

42 Cottage 3, Reserve 8232, Dedari

regarding their construction and operation and about the way of life of the people who worked and lived there.

P1564 No 4 Steam Pumping Station and No 5 Steam Pumping Station, Yerbillon, which is not included in the Historic Heritage database, can be viewed from the exterior. Interpretation is provided in the form of brochures, websites and interpretation panels onsite.

*No. 6 Steam Pumping Station (fmr), Ghooli*, is an example of the four smaller pump stations located on the eastern end of the Mundaring to Kalgoorlie Pipeline. Internal and external elements of the place are in poor condition, however the purpose of the place in association with the nearby pipeline is clearly demonstrated. As a key element in the implementation of the Goldfields Water Supply Scheme reflects its importance in the history of the scheme and its ongoing importance to the Wheatbelt region and Western Australia.

The presence of the surrounding elements, such as the sites of the former school, playground and workers' cottages that formed part of the pumping station community at *No. 6 Steam Pumping Station (fmr), Ghooli*, provide a view of a way of life that no longer exists for pumping station families and workers. It is likely further investigation may identify this at other pumping stations, such as No. 8 Pumping Station, Dedari where a more intact workers cottage has been retained.

*Other pumping stations*

A search of the historic heritage database for pumping stations did not return any comparable places that are not associated with Goldfields Water Supply Scheme.

Examples of pumping stations on the State Register of Heritage Places include:

- P9589 *Main Pump Station, Kununurra* (RHP) is a steel framed iron clad shed established as part of the Ord River Irrigation Scheme established in the town of Kununurra after World War II.
- P3298 *Low Level Sewage Pumping Stations Nos. 1 & 2, Perth* (RHP) were two combined sewage pumping stations and men's public toilets constructed in Perth in 1914. They formed part of a series of pumping stations in Perth and Fremantle associated with the metropolitan sewerage scheme.
- P4639 *Boulder Railway Station, Subway and Loopline* (RHP) comprises a series of ancillary and industrial structures, including Boulder Subway and Pumping Station constructed in 1903 to keep the subway dry enough for traffic.

Other wastewater pumping include P26300 Wastewater Pumping Station, Northam, but no others have been identified as warranting assessment to the State Register.

## 13. 4 KEY REFERENCES

Conservation Plan for Goldfields Water Supply Scheme, Volume I, prepared for the National Trust of Australia (W.A.), by the Research Institute for Cultural Heritage (Curtin University), in 1999.

Conservation Plan for Goldfields Water Supply Scheme, Volume II, Place I, No. 6 Pumping Station – Ghooli, prepared for the National Trust of Australia (W.A.), by the Research Institute for Cultural Heritage (Curtin University), in 1999.

National Trust of Australia (WA), January 2014, No 6 Pump Station Ghooli - Archival Record

## 13. 5 FURTHER RESEARCH

There are likely to be further references to many aspects of the Goldfields Water Supply Scheme in diaries, correspondence, family albums, publications, oral histories and newspaper articles. Research into these would improve the understanding of the social significance of *No. 6 Steam Pumping Station (fmr), Ghooli* and the Mundaring to Kalgoorlie Pipeline more generally.

After the closure of the pumping stations much of the machinery and equipment was removed, as were some houses and associated structures. Research into these would improve the understanding of *No. 6 Steam Pumping Station (fmr), Ghooli* and the Mundaring to Kalgoorlie Pipeline more generally. Archaeological investigation of *No. 6 Steam Pumping Station (fmr), Ghooli* and the surrounding area, including the cottages and rubbish and ash dumps[43], is likely to provide more information regarding the change in machinery and equipment over the period of operation of the place. It is also likely to provide more information regarding the lives of the workers and the families that lived at *No. 6 Steam Pumping Station (fmr), Ghooli* from 1902 to 2000.

Research into the Government Experimental Farm located nearby may provide further information on the influence and impacts the Mundaring to Kalgoorlie Pipeline, and more specifically at *No. 6 Steam Pumping Station (fmr), Ghooli,* had on agricultural pursuits in the region.

43 Any archaeological inspection would need to take into account the likelihood and adequate management of the asbestos contamination at the place.