



**HERITAGE  
COUNCIL**  
OF WESTERN AUSTRALIA

## **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.

#### **PRINCIPAL AUSTRALIAN HISTORIC THEME(S)**

- 3.4.3 Mining
- 3.23 Catering for tourists

#### **HERITAGE COUNCIL OF WESTERN AUSTRALIA THEME(S)**

- 110 Resource exploitation & depletion
- 303 Mining (incl. mineral processing)
- 407 Cultural activities
- 506 Tourism

#### **11.1 AESTHETIC VALUE\***

Within *Gwalia Museum Group*, the Mine Manager's House is a simple, elegant example of mining accommodation for a senior employee, in a garden setting. (Criterion 1.1)

*Gwalia Museum Group* has a landmark quality demonstrated by the visual impact of the Headframe from many positions around the towns of Gwalia and Leonora, both by day and by night, when it is floodlit. (Criterion 1.3)

#### **11.2 HISTORIC VALUE**

*Gwalia Museum Group* comprises a collection of substantial buildings, which provide evidence of the gold mining operations that took place at Gwalia between 1898 and 1963, as one of the most productive West Australian gold mining areas outside Kalgoorlie. (Criterion 2.1 & 2.2)

*Gwalia Museum Group* is a part of the mining town of Gwalia, the establishment of which was a direct result of the operation of the Sons of Gwalia mine, one of the major underground gold mines in Australia, which operated from 1896 to 1963. (Criterion 2.2)

*Gwalia Museum Group* had a short, but significant, association with Herbert Hoover, later President of the United States of America, who advised his

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

employers, Bewick Moreing, to purchase the Sons of Gwalia mine, and who was manager of the mine in 1898. (Criterion 2.3)

*Gwalia Museum Group* was closely associated with the Sons of Gwalia mine, which was operated by Bewick Moreing, a major mining company operating worldwide. (Criterion 2.3)

### **11.3 SCIENTIFIC VALUE**

*Gwalia Museum Group* can provide information regarding the technology and methods of the mining industry in Western Australia in the period 1896-1963. (Criterion 3.1)

The Winder is a fine example of a large, steam-powered winding machine, which operated from 1913 to 1963, and is an example of technological achievement in 1912. (Criterion 3.2)

### **11.4 SOCIAL VALUE**

*Gwalia Museum Group* is valued by the local and wider communities for its associations with the early gold mining history of the towns of Leonora and Gwalia and the ongoing value of the place as a frequently visited tourist attraction in the area, evidenced by the efforts of the local community in restoration, preservation and presentation of the group and the development of the Mine Office (fmr) as a museum. (Criterion 4.1)

*Gwalia Museum Group* contributes to a sense of place for the local community and visitors, as a significant remnant of the early mining history of the region and the landmark quality of the Headframe. (Criterion 4.2)

## **12. DEGREE OF SIGNIFICANCE**

### **12.1 RARITY**

The Headframe is the only large timber headframe surviving in Australia, and the Winder is the largest steam winding engine of its kind in Australia, and one of only three remaining. (Criterion 5.1)

*Gwalia Museum Group* presents a unique cultural environment with the Mine Managers House (fmr), Mine Office (fmr) and Assay Building (fmr) intact on their original site in close proximity to modern mining operations. (Criterion 5.1)

### **12.2 REPRESENTATIVENESS**

*Gwalia Museum Group* is a representative example of the infrastructure associated with mining from the late nineteenth to the mid-twentieth centuries, and as such contributes to a greater understanding of the area's mining operations from 1896 to 1963. (Criterion 6.1)

### **12.3 CONDITION**

The elements of *Gwalia Museum Group* are in fair to good condition, having undergone conservation work in 1987/88 and 1990.

### **12.4 INTEGRITY**

Although none of the buildings or elements still undertakes their original function, *Gwalia Museum Group* has retained a moderate to high degree of integrity.

## 12.5 AUTHENTICITY

Overall, much of the fabric of the brick buildings has been restored in the conservation works of 1987/88 and 1990, and in addition, the Mine Manager's House (fmr) has undergone recent additions and refurbishment. *Gwalia Museum Group* demonstrates a moderate degree of authenticity.

## 13. SUPPORTING EVIDENCE

The documentation for this place is based on the heritage assessment completed by Irene Sauman, Historian, and Laura Gray, Conservation Consultant, in September 2002, with amendments and/or additions by HCWA staff and the Register Committee.

### 13.1 DOCUMENTARY EVIDENCE

*Gwalia Museum Group* comprises a collection of single storey brick and corrugated iron buildings, which include Mine Manager's House (fmr) (1899) and its setting, Mine Office (fmr) (1898), Assay Building (fmr) (1898) and timber Headframe (1899 & 1913) and Winder (1913).<sup>1</sup> The buildings were associated with the operation of the Sons of Gwalia mine until its closure in December 1963. The buildings underwent restoration in the 1980s and 1990s. In 2002, the Mine Office is occupied as the Gwalia Museum, the Assay Building as the office for the Museum, and the Mine Manager's House as a residence for Western Mining staff. The site, Leonora lots 1127 and 1128, were gazetted Reserve 46751 on 13 February 2002 as an historic precinct.

Following the discovery of the rich Coolgardie goldfields in 1892, and Kalgoorlie in 1893, prospectors began to venture into the surrounding areas.<sup>2</sup> Gold was discovered in the Menzies area in 1894, and on 28 June 1895, the North Coolgardie goldfield, which included Menzies and areas north to Mount Leonora, was gazetted.<sup>3</sup> Gold was found near Mount Margaret in July 1895, which started a rush in the area, and the first tent store near Mount Leonora was established in November. In March 1896, prospectors A. Glendinning, Jack Carlson and Frank White discovered the reef, which was the beginning of the Sons of Gwalia mine. The group was financed by Thomas and Ernest Tobias, storekeepers of Coolgardie, and the Sons of Gwalia mining lease was registered in the name of Thomas Tobias.<sup>4</sup> On 12 March 1897, the Mount Margaret goldfield was gazetted as a field in its own right, with the warden's office situated at Malcolm.<sup>5</sup>

In 1897, ownership of the Sons of Gwalia mine was transferred to W. G. Hall and Pritchard Morgan, and Sons of Gwalia Limited was created. 110 men were working on the mine, which was operating a ten-stamp battery.<sup>6</sup> Other mines were also operating in the area, among them Trump, Forrest, Gold Blocks and Tower Hill. A townsite was established at Leonora, halfway between the Sons of Gwalia mines and mines to the north, but as there was no transport available between Leonora and the mines, the miners preferred to live closer to their work.

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1 The place has been called *Gwalia Museum Group* to distinguish it more clearly from the Gwalia Townsite Precinct, both of which are referred to locally as Gwalia conservation area.

2 Webb, Martyn & Audrey, *Golden Destiny: The centenary history of Kalgoorlie-Boulder and the Eastern Goldfields of Western Australia*, City of Kalgoorlie-Boulder, 1893, p. 178.

3 *West Australian Government Gazette*, 28 June 1895, p. 894.

4 Webb, Martyn & Audrey, op cit, p. 178; 'Chronological Table of Events, Leonora District', [1997], p. [1], Battye Library Q994.16/LEO.

5 *West Australian Government Gazette*, 12 March 1897, p. 452.

6 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd., *Sons of Gwalia Mine Manager's House Conservation Plan*, 1998, historical chronology.

Many miners put up their timber, hessian and corrugated iron dwellings on the mining leases. A shopping centre developed at the Gwalia Block and another group of stores was established near the Gwalia State Hotel, north of the Gwalia Block.<sup>7</sup>

In May 1897, Herbert Hoover came to Western Australia as manager-inspecting engineer for the London and Western Australian Exploration Company, which was associated with Algernon Moreing of Bewick Moreing & Co. Bewick Moreing & Co was a British based mine management company involved with many WA mines. Hoover inspected the Sons of Gwalia operation and advised Algernon Moreing to purchase the mine. The London and West Australian Exploration Company obtained control of Sons of Gwalia on 17 November 1897, and Bewick Moreing & Co launched the Sons of Gwalia Company on the London stock exchange in January 1898.<sup>8</sup>

Herbert Hoover was appointed Superintendent of the Sons of Gwalia mine in March 1898, and took up his position on 1 May. Hoover instigated efficiencies at the mine, including replacing the vertical shaft with an incline. He established the mine as a profitable and efficient operation, employing migrant miners, specifically Italian and Austrian, because they worked hard and would accept a lower wage. He arranged the construction of staff and office buildings including Mess dining room and kitchen, two-room cottages for the accountant and underground manager, the Mine Office, Assay Building and Mine Manager's House. During Hoover's time at Gwalia, the mine employed 500 men.<sup>9</sup>

The Mine Office was completed in October 1898, at which time the Assay Building was under construction. Herbert Hoover left Gwalia late in November 1898, returning to America to marry his fiancée Lou Henry before taking up a position in China. At that time, the Mine Manager's House had not been completed. Hoover handed his successor, Harry James, a mine operating with reduced costs and greatly increased profit. In 1899, James completed Hoover's building programme, which included the Mine Manager's House, blacksmith shops, engineers' machine shop, carpenters' shop, engine houses, mill building and cyanide works building.<sup>10</sup>

In 1902, Herbert Hoover became a partner in Bewick Moreing & Co, and spent some further time in the State making the Company's mines more efficient. The number of men employed at Sons of Gwalia had increased to 873 by 1902, but this was reduced to 500 by 1903.<sup>11</sup>

Herbert Hoover was born in Iowa in 1874. He was orphaned at age 9 and raised by a Quaker uncle. He studied mining engineering at Stanford and by age 40, he was a successful mine engineer, manager of a number of mining companies throughout the world, and a wealthy businessman. His ability for efficiency resulted in his appointment as 'food administrator' in the United States in 1917, and he headed a World War I relief commission that provided food for millions of people in Europe. He was appointed head of the Department of Commerce in 1920 and, as a Republican, was elected 31<sup>st</sup> President of the United States in

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7 King, Norma, *Ghost Towns of the North Country*, Norma King, 1974, pp. 14-15.

8 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, historical chronology.

9 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 33-34, from Sons of Gwalia records, Battye private archives MN270 1614A/1 Box 1.

10 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, pp. 37-38, references to Hoover's letterbooks, Sons of Gwalia records and Dept of Mines files, op cit.

11 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd., op cit, pp. 41-42, from Sons of Gwalia records, Battye private archives MN270 1614A/1 Box 1.

1929. The hardships caused by the Depression resulted in his losing the election to Franklin D. Roosevelt in 1932. After leaving the White House, Herbert Hoover founded the Hoover Library, wrote a number of books of memoirs and political commentary, and returned to humanitarian work during World War II. He headed two commissions on reorganization of the executive branch of government in the 1940s and 1950s. He died in 1964, at the age of 90.<sup>12</sup>

By 1909, the Sons of Gwalia mines were hauling and processing 500 tons of ore a day, but the grade of ore was declining and the machinery aging. In 1911, the winder engine broke down. It was replaced with a new steam Winder in 1913. Other changes included the installation of gas producers to produce electricity for the mines and conversion of all ore treatment to cyanide treatment. These changes improved the mines' efficiency and profitability.<sup>13</sup>

By 1910, most of the mines in the Gwalia and Leonora area had closed, but the Sons of Gwalia continued to work profitably. In 1921, a fire destroyed half the machinery at the mine and 200 men were laid off, while others continued to work re-treating the slime and sand residues. The rebuilt mine opened again in October 1923, but was not making a profit. In 1928, the Company received a loan, which allowed it to expand production and renew machinery not replaced after the fire, giving the mine a new lease of life. During the Depression, a gold bonus of £1 per ounce provided by the Federal Government re-invigorated the goldfields for a time. Sons of Gwalia repaid its Government loans and operated at a profit.<sup>14</sup> Many of those working on the mines and the woodlines of the eastern goldfields in the 1920s and 1930s were Italian, Greek and Yugoslav immigrants, some single men and others with families still in Europe.<sup>15</sup>

Production during World War II diminished and only 100 men and 26 ponies were working on the Gwalia mine at the end of the War. A continuing shortage of labour and the introduction of the 40-hour week made operations difficult. Production was low and the mine operated at a loss. In 1951, there were machinery breakdowns. In 1953, a new electric winder was installed, replacing the steam Winder. The cyanide plant was rebuilt and other improvements made, but the grade of ore declined below a profitable level. Government loans for improvements proved impossible to repay as costs outstripped profits and a decision was taken to close the mine on 31 December 1963. An accident, which damaged the Headframe, resulted in the mine closing four days earlier, on 27 December.<sup>16</sup>

The Sons of Gwalia was one of Australia's major underground gold mines in terms of operation time, output and scale. It operated for 65 years, from 1896 to 1963, with a break between 1921 and 1923. Its gold output of 2,580,411 ounces was the sixth largest in Australia, and it had 5,500 feet (1.7kms) of incline and vertical shafts operating to a depth of nearly 4,000 feet (1.2kms).<sup>17</sup>

Western Mining Inc leased the mine buildings from the Department of Mines for a minerals exploration base. Mine equipment and transportable buildings were auctioned from 26 to 28 October 1965 and drew representatives from mining,

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12 *The New book of Knowledge*, Grolier Inc., Danbury, Conn., 1982, Vol. 8, pp. 222-225.

13 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 40-43.

14 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 43-48.

15 Webb, Martyn & Audrey, op cit, pp. 661-662.

16 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 48-53.

17 Bell, P., Connell, J., McCarthy, J., *Gwalia Conservation Study*, State Heritage Branch, Dept of Environment & Planning, Adelaide, July 1985, Section 2 [p. 1].

engineering and salvage companies and local pastoralists. Among the equipment and machinery sold were six timber-framed corrugated iron clad houses, Mess building and surgery building, as well as equipment from the Assay Building, which included grinder, crucibles, cupel press, two furnace oil burners with pipe and tanks, assay scales, balances and microscope. The auction realised over £16,000. The Mess building, surgery building and timber-framed corrugated iron houses were transported elsewhere.<sup>18</sup> In 1974, the Leonora Tourist Committee was formed with the aim of preserving the town of Gwalia as a relic of the old gold mining days.<sup>19</sup>

In 1980, the price of gold rose to US\$800 per ounce which, together with modern technology, made mining viable in previously unprofitable areas. An open-cut mine operation began at Sons of Gwalia in 1984. In order for the mine pit to grow, relocation of existing buildings and mine structures was necessary. Various miner's houses have been relocated from the mining leases to the Gwalia townsite and the Headframe and Winder has been relocated to *Gwalia Museum Group*, some 300 metres northeast of its working position. State Premier Peter Dowding, who had worked at Sons of Gwalia mine in 1962 when he was a student, opened *Gwalia Museum Group* in 1989.<sup>20</sup> The Sons of Gwalia pit has encroached to the southern edge of *Gwalia Museum Group*.

#### Mine Manager's House

The Mine Manager's House was constructed to a design approved by Herbert Hoover and completed in 1899 after he had left Gwalia. The site he chose was on a rise, where it would catch the slightest breeze, and was adjacent to the Company's Mine Office and Assay Building. The area occupied by these buildings was known to the miners and local residents as 'Staff Hill'.

Although the bricks for the Assay Building (fmr) and Mine Office (fmr) were made on site, Hoover called tenders for the bricks for the Mine Manager's House (fmr). On 31 May 1898, the tender of J. Morton of Kalgoorlie was accepted for two guineas per 1000. The bricks were made from Kalgoorlie clay/slimes. The brickwork was most likely completed before Hoover left for China. On 25 November 1898, his successor Harry James ordered window frames, glass, cornice mouldings, ripple iron and spouting from Allen & Peat, Menzies. Other items purchased included a domestic water condensing plant ordered in December.<sup>21</sup> The place would have been ready for occupation early in 1899.

Gwalia was a company town and the Mine Manager's House (fmr) reflected the position of the incumbent as the occupant of the most senior position on the largest mine. Important visitors to Gwalia, including various Governors, Premiers and Bishops, were entertained and often accommodated at the place. Herbert Hoover and his wife, Lou Henry, stayed at the Mine Manager's House (fmr) in February 1902, when R. M. Atwater and his family were in residence.<sup>22</sup>

Harry James was the first manager to occupy the Mine Manager's House (fmr), and he remained at Gwalia until 1901. American R. M. Atwater, his wife and

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18 Gregsons Auctioneers, Auction catalogue, Sons of Gwalia private archives, Battye Library, MN 270/2, ACC3043A, Item 11 Receivers & Manager's auction sale 1965-66 & Item 15, Plant disposal 1964; Kalgoorlie Miner, 26-29 October 1965, report on auction p.2 each issue. No information has been found in either Sons of Gwalia archives or local newspaper to indicate who bought what.

19 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, p. 53.

20 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 56-57.

21 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp.78-80.

22 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 60-63.

daughter lived there until they went to Malaya in April 1902. The next manager, William Joseph Loring, was also an American. When he took up residence, he ordered a dozen servants' bells. In 1903, Loring became joint manager for Bewick Moreing in WA and it was possibly at this time that the Mine Manager's House (fmr) was extended to reflect his higher position. The work undertaken appears to have included completing the verandahs to the east, the addition of the room to the north (Room 8 on the numbered floor plan, Figure 12, of the *Conservation Plan*), the study addition under the west verandah, the bathroom addition under the east verandah and enlargement of the main bedrooms.<sup>23</sup>

G. M. Burrowe, P. Fitzgerald and E. T. Kane were acting Superintendents of the mine in 1904, during Loring's absences on other business. John McDermott (1906-12) and A. Wauchope (1912-18) followed as mine managers. The Wauchope children, Hazel and Douglas, attended the local school and enjoyed a tank as a swimming pool in the garden. Wauchope had new picket fences constructed. John Adam was manager from 1918 to 1926/7. He and his wife had three sons. The house was renovated at this time, possibly to accommodate changing domestic fashion, which would have included fewer servants. A utilities room was enclosed on the verandah to replace the original laundry and many ceilings were replaced. In 1927, Victor Thomas Edquist, the mine metallurgist, became manager. He occupied the Mine Manager's House (fmr) with his wife and four children, although the children were away at school for much of the time. The Bishop of Kalgoorlie visited occasionally during their residence. In 1935, Edquist was appointed Director of Bewick Moreing in Australia, and his place was taken by Harold Vipend Rowe, the former underground manager of Sons of Gwalia. In 1937, expenditure on cementing the verandah floors was authorised. In 1947, Rowe became Australian Manager for Bewick Moreing & Co and moved to Perth. William Cayser, the Mine's chief engineer, was appointed Manager in 1947. He was succeeded by Reginald Barden (1949-63).<sup>24</sup>

The garden was a particular feature of Mine Manager's House (fmr). It was established early, as Harry James is recorded as providing flowers and greenery from his garden for the opening of the Methodist Church in 1899. The garden was tended by Italian gardeners over the years.<sup>25</sup>

(The section of *Sons of Gwalia Mine Manager's House Conservation Plan* detailing the garden and construction and changes to the place (pp. 78-80, 82, 84, 86, 90, 92-3) has been attached.)

When Western Mining took over the buildings, Mine Manager's House (fmr) was occupied by the Company's regional geologist.<sup>26</sup> Those who lived in the place were: Jim Lalor and family (1965-68), Warwick Hughes (1969) and Don and Donna Reid (1970-80). When the Reids left, the place was empty for a time and goats ate the garden. Other Western Mining personnel and caretakers occupied the place but little work was done to maintain it. The brickwork was showing signs of serious deterioration through the ingress of damp and salts from regular watering of the garden over the years. In 1996, *Sons of Gwalia NL* announced an initial contribution of \$250,000 for the restoration and conservation of the Mine Manager's House (fmr), at which time the *Conservation Plan* was prepared.<sup>27</sup>

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23 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 42 & 64.

24 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 50-53 & 64-65.

25 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, p. 73.

26 Webb, Martyn & Audrey, op cit, p. 943.

27 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 103.

Changes during recent refurbishment have included the addition of ensuite bathrooms to two bedrooms, a new bathroom at the rear, and extension of the verandahs to the rear of the place.<sup>28</sup>

In 2002, Mine Manager's House (fmr) is occupied by Western Mining staff.

Mine Office (fmr)

The Assay Building (fmr) and Mine Office (fmr) were constructed in 1898 to a design approved by Herbert Hoover, using bricks made on site.

On 30 May 1898, Hoover wrote that he was:

... greatly opposed to temporary structures and have so amended my plans as to make such construction as is being done permanent and to involve less outlay. I hope to build and furnish office, Assay Building, storerooms etc in good order so as to be easily enlarged.

We have temporary foundations laid for the main office and are commencing this week the foundations for the Assay Building. We shall build of brick, a more economical material than wood or stone, corrugated iron being out of the question in such a hot place.<sup>29</sup>

By 18 June 1898, the brick making was underway and Hoover wrote to R. D. Hortop of Menzies requesting him to put in a bid for the bricklaying of four buildings. In July, his monthly report stated that 'the first kiln of bricks has been completed and the various buildings are under way'.<sup>30</sup>

The buildings are all of burnt brick, and although substantial and constructed to give greatest comfort in such a hot climate, are very plain and economical as possible.<sup>31</sup>

The Mine Office (fmr) was listed as 'General office of four rooms, including strongroom with safe door £340'.<sup>32</sup> The strongroom door for the Mine Office is recorded as being ordered from Sandovers. In September it was reported that:

The new office Building is now ready for the roof, and will we hope be ready for occupancy before the hot weather. On the suggestion of the Coolgardie office we are putting a double roof over it which will insure (sic) additional coolness and add something to our estimated costs.<sup>33</sup>

The Mine Office (fmr) provided offices for the mine administrative staff including the mine manager and the accountant. Gold would have been held in the strong room along with mine records.

The four-room Mine Office (fmr) was extended later with the addition of another two rooms. It is not known when this was done, but was most likely in the early 1900s when the Mine was at its busiest, and most profitable.<sup>34</sup> During the 1937-38 reconstruction and improvement programme, when mine manager Harold Rowe 're-organised the layout of the mine and remodelled, repainted and

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28 Physical evidence.

29 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, pp. 33-34, quoting Hoover's letterbooks.

30 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, p. 35, quoting Dept of Mines file BM 155.

31 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, p. 35, quoting Dept of Mines file BM 155.

32 *ibid.*

33 Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, p. 35, quoting Dept of Mines file BM 155.

34 Physical evidence.

generally cleaned up', £258 was spent on the Mines Office (fmr), but no details of the work have been found in the remaining records.<sup>35</sup>

When Western Mining took over the buildings in 1964, it occupied Mines Office (fmr) as its offices. In 1971, the Company moved its operation to the much larger and grander Gwalia State Hotel. Don and Donna Reid, who were occupying Mine Manager's House (fmr) at that time, established a small museum in Mine Office (fmr). The Museum was opened in May 1972, by Peter Coyne, MLA. Included in the museum is a section on Herbert Hoover as a 23-year old mining engineer, a display of photographs showing the history of Sons of Gwalia mine and the way of life in the goldfields including the woodlines, camel teams and trams, items such as patterns and moulds, homemade household utensils, and Edwardian furniture including a Mazzoletti Delebio automatic piano. A woodline locomotive, 'Ken', is also part of the museum display, housed in a separate shed.<sup>36</sup>

In 1986/87, conservation works were undertaken on the Mines Office (fmr), funded by the National Estate Program, Sons of Gwalia Company and The WA Tourism Commission. The project comprised general repair and maintenance of the building.<sup>37</sup>

In February 2002, the site was gazetted Reserve 46751, as an historic precinct, and vested in The Leonora Gwalia Historical Museum Inc. The Mine Office (fmr) continues to be occupied as a museum.

#### Assay Building (fmr)

The Assay Building (fmr), constructed under similar conditions to the Mine Office (fmr), was described in July 1898 as 'Assay Building of three rooms including scale room £220'. No other information on the building has been located.<sup>38</sup> Some £27 was spent on minor renovations, possibly painting, during Harold Rowe's 1937-38 reconstruction and improvement programme. A fourth room was added at an early date, and there have been other additions made in the 1970s. The physical evidence indicates that much of the interior has been reconstructed.<sup>39</sup>

Assaying is the analysis of ore to determine its content, in particular its metal content. Regular assaying was necessary to determine if the current ore seam was worth mining and processing, and to plan future development of the mine.

Assaying is an ancient process, which was well established by the sixteenth century. It was carried out by one of two methods: wet or dry, the latter being more common, and also known as fire assaying. This method requires the ore sample to be reduced to a powder, or 'pulp', which is placed in a dish with a form of lead (litharge) and various chemicals to assist the separation of metal from slag in the ore. The sample is then roasted in the assay oven until molten, when it is poured into a mould and allowed to cool. As it cools, the slag settles at the bottom and the metal forms a 'button' on the top. The button is heated again in a 'cupel', a container that absorbs the lead and other impurities in the button, leaving only the gold and silver. This button is then weighed on a button scale. The next step is called 'parting' where the silver in the button is chemically

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<sup>35</sup> Sons of Gwalia NL, Records 1897-1964, Battye private archives, MN270 ACC 1614A, Item 256, Reconstruction and improvement programme, 1937-38; Erickson, R., Taylor, R., & Slavin Architects Pty Ltd, op cit, p. 50.

<sup>36</sup> *West Australian*, 28 May 1972, p. 39; *The Country Museum*, No 16, June 1976 & No. 17, September 1976, pp. 8-9; physical evidence.

<sup>37</sup> WA Heritage Committee, *Final Report: Gwalia Conservation Works*, February 1991, HCWA File 1465.

<sup>38</sup> Sons of Gwalia NL, Records 1897-1964, Battye private archives, MN 270 & MN 294.

<sup>39</sup> Sons of Gwalia NL, Records 1897-1964, Battye private archives, Item 256, op cit; physical evidence.

washed away leaving only gold. From the weight of the gold button the assayer can calculate the gold and silver ore value per ton of ore. If the remaining button is too small to weigh it is described as a 'trace' or 'colour'.<sup>40</sup>

This is basically the process undertaken in the Assay Building (fmr), which still has the assay ovens in situ. The assaying process described is still used in the mining industry, except that electronic balances and mechanical pulverisers are employed instead of manual processes.<sup>41</sup>

In 1989/90, major conservation works were undertaken on the Assay Building (fmr), funded by the National Estate Program. The building was in a state of decay with crumbling brickwork. Work involved replacing the brickwork with new clay bricks, completely rebuilding the verandahs, reconstructing the enclosed timber-framed workrooms with new timber and recycled corrugated iron, and installing new ceilings throughout. Items of mining and assay paraphernalia that had been removed over the years were reinstalled in the place.<sup>42</sup>

In 2002, Assay Building (fmr) is occupied as the office of The Leonora Gwalia Historical Museum Inc.

Headframe and Winder.<sup>43</sup>

Ore mined in an underground mine shaft had to be brought to the surface for treatment. The hauling system at Sons of Gwalia between 1913 and 1963 comprised a steam Winding Engine (Winder) and a Headframe with inclined runway, which hauled the containers (skips) full of ore to the surface. The Headframe was constructed in 1899 and extended in 1913 to accommodate the new 1912 Winding Engine.

The Headframe with its incline runway was installed as a result of Herbert Hoover's overhaul of the mine operations with the establishment of an incline shaft in place of the vertical shaft. The Headframe initially worked with an 1899, 50 horsepower Risdon steam engine with two cylinders, 16 inches (406cm) in diameter and 35 inches (914cm) stroke driving 6 feet (1.8m) diameter drums. In 1912, the Department of Mines declared the Risdon engine inadequate and issued a limited permit for its use. A new Winding Engine was installed, and reported as probably being ready for its official test about the middle of April 1913.

The new Winding Engine was a 1912 Fraser and Chalmers 27 inch (685cm) diameter, twin cylinder steam engine with a five feet (1.52m) stroke, driving twin winding drums of ten feet (3.05m) diameter. It was designed and built at Fraser and Chalmers Engineering Works of Erith, Kent, England. The speed of the Engine appears to have been about 1,500 feet per minute, or approximately 48 revolutions per minute of the winding drum. The speed was frequently under review at Sons of Gwalia due to trouble with derailment and other faults. Various alarms and safety devices were added in 1937 to prevent overwinding or slipping of the skips.

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40 'Fire Assaying', Arizona Department of Mines and Mineral Resources website, [www.admmr.state.az.us/assay.htm](http://www.admmr.state.az.us/assay.htm), 1 September 2002.

41 *ibid.*

42 WA Heritage Committee, *Final Report: Conservation of the Assay Building, Gwalia*, February 1991, HCWA File 1465.

43 Information in this section is from Bell, P., Connell, J., McCarthy, J., *op cit*, Section 7, Technological Summary, [pp.1-62].

The Winding Engine was powered by steam generated from a combination of Cornish, Lancashire & Babcock and Wilcox type boilers, which, due to poor quality water, frequently needed to be replaced. The boilers depended for draught on two large steel chimneys to which they were connected by a brick flue. The Winding Engine was housed in the Winder House of timber-framed construction with Oregon timber and steel tie trusses for the main roof spans and corrugated iron cladding and roofing. There was a light well along the ridge of the roof.

The purpose of the Headframe was to guide the hauling ropes between the Winder and the skips in the shaft and enable the skips to be elevated so the ore could be discharged at a convenient height above ground. The Sons of Gwalia Headframe was about 62 feet (20 metres) high with a 45-degree runway on the same incline as the mineshaft. The skips were emptied into a storage bin within the Headframe structure. The primary crusher was located beside the Headframe and the ore from the storage bin was fed into the primary crusher by gravity. In the crusher, the ore was reduced to less than 25mm in size. From there, a belt elevator carried the ore to the main storage bin to be held for further processing.

Steam winding engines came into operation in England about 1780, and despite other forms of energy being used for other processes, steam remained as the only satisfactory hauling medium until electric motors and satisfactory switch mechanisms were developed. The Gwalia Winding Engine is claimed to have represented 'a generation of engines when all features had reached the acme of superior design'. Steam winders continued to be manufactured, in diminishing numbers, until about 1943.

By 1985, the open pit workings had placed the Headframe and Winding Engine under threat and in 1987 they were moved to their current site in *Gwalia Museum Group*. A galvanised steel shed was provided as a winder house on the new site. The Headframe is lit by spotlights at night.<sup>44</sup>

Included as part of the Gwalia Museum display is a woodline steam locomotive known as 'Ken', situated on the adjoining site to the west on Tower Street and housed in an open-sided shed. The loco was one of four constructed at the Midland Junction workshops in 1934, specifically for the Sons of Gwalia woodline. The woodline was in operation until the mine closure in December 1963. The locomotive was officially called 'Midland' during its period of operation, but was popularly known as 'Ken', which is claimed to have been an acronym for the names of three directors of the Sons of Gwalia Company.<sup>45</sup> Also on this site is the former mine engineer's house, known as the 'White House', a corrugated iron clad dwelling, probably of two rooms originally, which has been considerably enlarged and altered over the years.<sup>46</sup>

The Assay Building, Mine Office, Mine Manager's House, and Headframe and Winder House and Engine have been given a category 1 management level on the Shire of Leonora Municipal Heritage Inventory, adopted 22 November 1998.<sup>47</sup>

On 13 February 2002, Leonora Lot 1127 (site of Mine Manager's House) and Lot 1128 (site of Mine Office (fmr), Assay Building (fmr) and Headframe and Winder)

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44 Ball, Julia & Aris, Kelly, *Shire of Leonora Municipal Inventory of Heritage Places*, Site G5.

45 Ball, Julia & Aris, Kelly, *Shire of Leonora Municipal Inventory of Heritage Places*, Site G24.

46 Physical evidence.

47 Ball, Julia & Aris, Kelly, *op cit*, Sites G3-G6.

was gazetted Reserve 46751 as an historic precinct vested in the Leonora Gwalia Historical Museum Limited.<sup>48</sup>

## 13.2 PHYSICAL EVIDENCE

*Gwalia Museum Group* is located in Gwalia townsite, two kilometres southeast of Leonora, in the eastern goldfields. *Gwalia Museum Group* is situated on top of the hill at the east end of Tower Street, in the extreme southeast corner of the Gwalia townsite, on the north side edge of the Sons of Gwalia open pit mine.

The place is approached up the Tower Street hill with the open cut mine falling away on the right side (south). On the left is a much altered, early corrugated iron clad dwelling and a steel framed open sided shed housing the steam locomotive 'Ken'. Also on the left, in front of a large steel framed and clad shed, is a car park, which serves the museum. Vehicular and pedestrian access to the museum is gained through the steel framed cyclone mesh gate on the road that continues up the hill into *Gwalia Museum Group*, which is defined by a cyclone mesh fence. The area is predominantly gravel or blue metal surface except for the grounds in front of the Mine Manager's House (fmr).

*Gwalia Museum Group* comprises Mine Manager's House (fmr) in its setting, Mine Office (fmr), Assay Building (fmr), timber Headframe, and Winder and winder house.

Within the area, the steel framed and clad winder house is on the immediate left (north), with another smaller steel framed and corrugated iron clad shed on the right (south) behind the Assay Building (fmr). Proceeding further up the hill, is the Headframe on the left (north), due east and attached to the winder in the winder house, the Mine Office (fmr) on the right, and the Mine Manger's House (fmr) ahead.

### Mine Manager's House (fmr)

Mine Manager's House (fmr) is located on the highest part of the hill that overlooks Gwalia townsite, to the northwest, and the Sons of Gwalia open pit mine on the south and southeast. The place faces south to the open pit, and a substantial area of lawn remains between the terrace in front of the house and the open pit. A brick retaining wall, pillars and remnants of picket fence are all that remains of the terrace. The remainder of the yard surrounding the place is either undeveloped or recently cleared except for some cacti and other plantings along a portion of the west side (main approach entry). The concrete water tank 'swimming pool' is still in place on the east side of the dwelling, as is the cast iron water tank. There is no evidence of any original plantings in the front garden, although mature Eucalyptus trees frame the view of the open cut mine.

Mine Manager's House (fmr) displays characteristics of the Federation Bungalow style. The place is a single-storey, verandahed building with simple massing and broad roof planes. The original main facade that faces south was symmetrical, although subsequent extensions have resulted in asymmetry.

Mine Manager's House (fmr) is a single-storey face brick construction with a double-hipped original short-sheeted corrugated iron roof and replacement galvanised steel bullnose verandah roofs. The red coloured face bricks are laid in English bond coursing and feature cream coloured brick quoins and soldier headers. Cement render to windowsill height has been applied to the front and west brick walls of the dwelling, and there is evidence of recent repairs and re-

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<sup>48</sup> DOLA, Reserves Index Enquiry, Reserve 46751.

pointing to some brickwork. The recently reconstructed timber verandahs are supported by 4-inch (10cm) square timber posts with timber colonial cross balustrades that are also recent replacements. The tall corbelled face brick chimneys feature on the roofline.

The footprint of Mine Manager's House (fmr) is predominantly a rectangle with extensions on the east side. The original central front (south) entry door opens into a corridor, with rooms each side, and accesses a large room at the rear. The two front bedrooms of the three bedrooms along the right side of the corridor (east) each have recent ensuite additions on the east side. The two main rooms on the west side of the corridor are connected by a wide decorative plaster arched opening. Part of the verandah on the west side has been enclosed. The large room at the rear opens to a new rear and side verandah and accesses recent bathroom facilities on the east side and the kitchen on the west side.

The front door is panelled with half glass, sidelights and toplights that still evidence some original red coloured glass. The windows, original and replacements, are timber framed double hung sashes on rendered sills, and the windows flanking the front door have sidelights. French doors access the east and west verandahs. The interior doors are original and replacement four-panelled doors.

On the interior, floors in the corridor and immediate rooms each side are the original 5-inch (13cm) Oregon floorboards. The remaining timber floors are replacement 5-inch (13cm) jarrah boards and concrete with ceramic tiles on the floors in the kitchen and wet areas. Architraves and skirting boards are in place throughout with replacement elements in the refurbished areas. The original walls are hard plaster, the rear wall of the rear room is lined with recycled pressed metal sheets, and the kitchen, bathrooms and toilets walls are tiled. The ceilings are mostly 1930s plaster with art deco centrepieces. The kitchen and other verandah enclosures are lined with compressed sheeting with exposed battens, and the new bathrooms have ripple iron ceilings. Original mantelpieces remain in place, 1930s light fittings remain in situ, the three bedrooms all have matching 'original' wardrobe units, and the kitchen, bathrooms and toilets have contemporary fitouts.

#### Mine Office (fmr)

Mine Office (fmr) is located on west side of Mine Manager's House (fmr), facing north, with a gravel driveway on the south side between the building and the open cut mine. The building is surrounded by a gravel apron.

Mine Office (fmr) is a purpose built functional structure with characteristics the Federation Bungalow style.

Mine Office (fmr) is a single-storey face brick construction with a hipped roof clad with custom orb profile white powder-coated galvanised steel sheeting. The front verandah and two side verandahs are under a separate roof. The painted face bricks are laid in English bond coursing. The brick paved verandahs are supported by 5-inch (13cm) square timber posts. Tall corbelled painted face brick chimneys feature on the roofline.

The footprint of Mine Office (fmr) is predominantly a rectangle. The front elevation (north) has two doors symmetrically placed in the front wall. The west front door provides access to the museum. The four original rooms are interconnected, and the rear two rooms each connect directly into the larger two rooms across the rear.

The doors are the original four panelled doors with toplights above. The original windows are timber framed double hung sashes on rendered sills.

The floors in the front four rooms are the original 5-inch (13cm) Oregon floorboards. The remaining floors are 5-inch (13cm) jarrah boards. Architraves and skirting boards are in place and differences are evident between the four front rooms and the two rear rooms. The original walls are hard plaster, and the two rooms at the rear have picture rails around each room. The ceilings are the original ripple iron with hexagonal vents in the four front rooms and diamond shaped vents in the rear two rooms. Original, simple bracketed mantelpieces remain in place, except for an elaborate replacement in one room. There is a safe built into the wall, and some original shelving, as well as a built in wall unit in the west rear room. On the east side verandah, two windows have bracketed shelves at sill level and a timber railing on the outside. There is a sloped ledge along the verandah edge in that vicinity.

#### Assay Building (fmr)

Assay Building (fmr) is located on the west side of Mine Office (fmr), facing north, with a gravel driveway on the east side between the buildings and the open cut mine immediately on the south and to the west.

Assay Building (fmr) is a purpose built functional structure with characteristics of the Federation Bungalow style.

Assay Building (fmr) is a single-storey face brick construction with a hipped gambrel corrugated iron roof. The painted face bricks are laid in English bond coursing. The south verandah is supported by 5-inch (13cm) square timber posts and has a concrete floor. Tall corbelled painted face brick chimneys feature on the roofline.

The footprint of Assay Building (fmr) is predominantly a rectangle. The entry is on the south elevation. The four main rooms are interconnected.

Much of the interior fabric is reconstructed, including the rear wall (north) where the ovens are located. The doors are four panelled doors. The windows are eight-pane timber framed double hung sashes on rendered sills. The floors timber covered with carpet. The interior walls are face brick and the north wall has vertical steel structural supports. The ceilings are battened flat fibre-cement sheeting. The original ripple iron with hexagonal vents in the four front rooms and diamond shaped vents in the rear two rooms. There is extensive timber shelving in most rooms. The assay ovens remain in situ. Verandah enclosures on the west side are lined with corrugated iron. There is a more recent enclosure at the rear (north) with external face brick and internal c.1970s timber panelling on the walls, battened asbestos ceilings on the rake and a brick paved floor.

#### Timber Headframe

The timber Headframe is located on the north side of the site, immediately adjacent to a steep decline down to the north. The winder house is located on the west side with a number of pulley connections between the Headframe and the Winder.

The timber Headframe construction is mostly the original Oregon timber.

#### Winder and winder house

The Winder is housed within the winder house immediately west of the Headframe, and adjoining the west boundary of *Gwalia Museum Group*.

The winder house is a steel-framed galvanised steel shed of no significance other than for protecting the machinery it houses from the elements and providing security.

The Winder was constructed by Fraser and Chalmers Ltd in Erith in England. It is a large machinery construction.

*Gwalia Museum Group* is generally in fair to good condition. Maintenance takes place on an as-needed basis and there are some elements that require attention.

Although none of the buildings or elements still undertake their original functions, Mine Manager's House (fmr) is reverting to a residential function, the other buildings interpret their original functions, and the Head frame and Winder, although relocated to the site, certainly inform of their working functions. *Gwalia Museum Group* has retained a moderate to high degree of integrity.

Overall, much of the fabric of the brick buildings has been restored in recent decades, and the Mine Manager's House (fmr) has also undergone recent additions and refurbishment. *Gwalia Museum Group* demonstrates a moderate degree of authenticity.

### 13.3 COMPARATIVE INFORMATION

All the elements of *Gwalia Museum Group* are registered as part of the National Estate. The Mine Manager's House (fmr), its Garden, the Mine Office, and the Headframe and Winder are all registered as separate elements, while the Assay Building would be considered part of the Leonora-Gwalia Conservation Area registered place.

The Headframe and Winder are of particular rarity. The only other winder engines located on the Register of the National Estate are at the Yerranderie Silver Mining Field, Oakdale, NSW where there are two smaller steam winding engines as part of a larger mining complex, which includes crushers, public buildings, shops and residences.<sup>49</sup>

Mine Manager's House, Wiluna, a single storey mud block and timber framed residence, with roughcast render finished walls and a corrugated iron gambrel roof in the Federation Bungalow style that employs elements of the Interwar Old English style, constructed in 1929, as the residence for the General Manager of Wiluna Gold Mines, was entered into the State Register of Heritage Places on 30 August 2002.

The Mine Manager's House at Gwalia is similar in style and substance to the residences of the major Government officials in the goldfields, the Mining Wardens. It bears comparison with Warden Finnerty's House, Coolgardie, and the Warden's House, Menzies. Mine Manager's House (fmr) and the former Warden's House, Menzies are Federation Bungalow style residences. Warden's House, Menzies (1897) is of stone construction with brick quoining and has been in use as medical facilities for the town since 1927. Warden Finnerty's House is a bungalow style residence in Federation Classical style in a simple garden setting. It is constructed of stone with brick quoining. Mine Manager's House (fmr) is of particular significance for its garden setting, while Warden Finnerty's House has structural interest for the ventilated roof lantern.<sup>50</sup>

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<sup>49</sup> Places associated with mining, Register of the National Estate.

<sup>50</sup> Heritage Council assessments, Warden Finnerty's House and trees, Warden's House Menzies.

#### **13.4 REFERENCES**

R. Erickson, R. Taylor and Slavin Architects Pty Ltd, *Sons of Gwalia Mine Manager's House Conservation Plan*, 1998.

#### **13.5 FURTHER RESEARCH**

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