HUNTER WATER
SECTION s170 REGISTER

ITEM NAME:

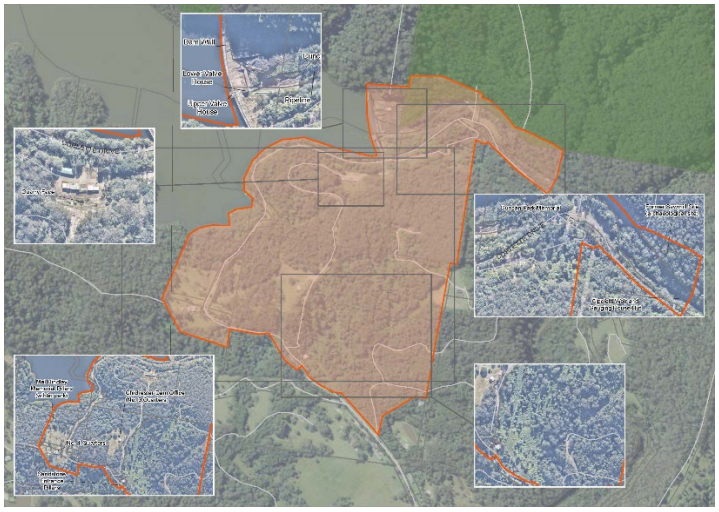
Chichester Dam Complex

Contents:

ITEM DETAILS

Item Name	Chichester Dam
Other / Former Names	N/A
NSW SHI No.	3630116
GID	504503
Plant No.	WH-CHI-DAM
Local Government Area	Dungog
Lot and DP	Multiple (refer to associated mapping/GIS data)
Address	Chichester Dam Road, Bandon Grove NSW 2420
Curtilage	The curtilage of this asset is defined by its physical extent and does not correspond to associated legal allotment boundaries. Portions of the curtilage extend outside of Hunter Water owned land so as to capture all significant elements associated with the asset.

View of the Chichester Dam



Asset location and curtilage (refer to Figure 1 for additional detail)

HISTORICAL OVERVIEW

Current Use	Water storage
Former Use	N/A
Designer / Builder	Public Works Department
Historical Notes	Chichester Dam is Hunter Water's oldest source of water supply still in service. Rather uniquely, the construction of the Chichester Scheme is seen as having been an initiative of the Hunter District Water Supply and Sewerage Board, and not a response to popular agitation or a programme imposed by government. The Dam's catchment area forms part of the Chichester State Forest, now known as the Barrington Tops National Park, covering an area of 197 square kilometres, and rising to a height of 1,550 metres. This catchment area is regarded as one of best in Australia and has been protected from logging thanks to an agreement between the Hunter Water Corporation and the NSW Forestry Commission. The necessity of finding a new source of water supply became evident from the early 1900s. Not only was it felt that the Walka Waterworks would not be able to supply the increasing needs of the Newcastle region, but the dependability of the source could be extremely doubtful. In the drought of 1902-03 the flow in the Hunter River was so insufficient, that in order for the water to reach the Walka intake workmen had to regularly assist the flow by clearing passages in the riverbed. In addition, restrictions had to be placed on the pumping of water for irrigation purposes upstream of the Waterworks. Another reason behind the desire to secure a new supply of water for the region was that the existing supply of water, obtained from the Hunter River, was so hard that its use for domestic purposes was considerably restricted. As such, most households had a domestic rainwater tank to meet cleaning and bathing needs. As such, in addition to naturally growing demands due to population increases, it was anticipated that should a soft supply of water be obtained, consumption would increase instantly as people would no longer need to rely on their own supplies of water for domestic use. The Board began to take steps to secure the necessary amplification of the existing water supply system in October 1907, with a full account of these actions included in the Annual Report for the year ended 30th June 1914. Investigations into the Chichester River, specifically, commenced around 1909, when the Board received a letter from William Longworth, a mine manager. In the letter he described a shooting trip to the head of the Chichester, Little and Williams Rivers, and advised the Board that he had found in Chichester Valley '*a splendid stream of beautiful soft water, as clear as crystal and as good to drink as could be wished for*'. Whilst Longworth is generally acknowledged as the founding father of Chichester, a locomotive engineer, James Sharp, claimed to have discovered the site in the late 1890s, but had not revealed it to the Board until 1912. In the following years, Longworth guided senior engineers on inspections of the Chichester River and possible Dam sites in the Mt Royal Ranges. Henson, the Board's Chief Engineer from 1892 to 1925, had originally come up with a concept of a gravitation scheme based on elaborate works in the Mt Royal Ranges, however had overlooked the Chichester River during these field surveys for his report on the Hunter Valley's water resources in the early 1900s. Henson's scheme was thus modified as Public Works Department and Board interest became more and more focussed on a storage Dam on the Chichester River.

It was reported in the 1909-10 Annual Report that the Board had received communication on 12th September 1909 from the Under-Secretary for Public Works Department pointing out that an investigation had been made, so far as the data available would permit, of the Chichester River scheme. Whilst it was reported that the Under-Secretary had notified the Board that there was not sufficient information to justify a departure from the Goulburn River water supply scheme, this was the first and only mention of a formal desire to defer or annul the progression of plans for the Chichester Dam.

In May 1913 the Public Works Department informed the Board that it was preparing a gravitation scheme to bring water from a Dam on the Chichester River, in order to relieve the present pumping at Walka. Having been accepted by the Hunter District Water Supply and Sewerage Board, the scheme was then referred to the Public Works Committee for inquiry and report. The submitted scheme covered the construction of a Dam of 5,000 million gallons capacity on a site below the junction of the Chichester and Wangat (or Little) Rivers, a steel gravitation main of eight million gallons capacity per day from the above Dam to connect with the existing pipeline to Buttai Reservoir, an additional gravitation main from Buttai Reservoir to Waratah Reservoir, additions to the existing reservoir at Waratah and additions to the existing reservoir at Newcastle.

Although the Chichester proposal had been widely publicised in the press, there was little public discussion of the important issues involved. Press reports were mostly supportive, interpreting the proposal as a radical change of approach necessary to meet increased demand for water. However, despite support for the scheme, the prospect of higher water rates, which would result, remained an obstacle for the community. It may have been due to these hesitations that a remarkable range of alternative proposals were put to the Public Works Committee in 1915, some intended to supplant Chichester and others to complement it. Despite this, however, an inquiry into the scheme was opened on 26th February 1915, and, following recommendation by Public Works Committee, the Chichester River Gravitation Scheme was authorised by Parliament, as Act No. 20, in 1916.

A Mr E.M. de Burgh, the Public Works Department's Chief Engineer for Water supply and Sewerage, was subsequently placed in charge of the design and construction of the Dam. Mr C.W. King, Engineer-in-Charge of the Newcastle District for the Department, was appointed to oversee the construction work. Mr E.T. Henning made Resident Engineer. Construction on the scheme began in 1918, with good progress reportedly made in the first few months. The whole of the preliminary work prior to the actual construction of the Dam was reported to have been practically brought to completion and Dam construction work commenced by the close of the 1917-18 financial year.

However, considerable trouble was to be encountered due to the unstable nature of the country, which consisted of friable clay material and rock boulders to a depth of over 60 feet above the foundation work. In 1918-19 difficulty was encountered in the preparation of the foundations for the Dam, the rock having proved of a faulty nature, necessitating considerably increased excavation, and at one stage much of the excavation and concrete work was buried following a heavy fall of rain caused a slip to occur. Further, progress was heavily handicapped due to the war conditions, with it being extremely difficult to obtain even the most ordinary machinery and materials.

Despite this, the whole of the preliminary work was completed by the end of the year, and the excavation work was progressing well ahead of the concreting. Other delays experienced in the construction were due to a shortage of cement, which saw construction of the Dam suspended in August 1920, with the labour engaged diverted to construction of the roadbed for the gravitation main. Another difficulty met with the construction of the Dam was the total absence of sand deposits of any kind for many miles around in the neighbourhood of the work. As such, sand was transported from Newcastle in steam-powered Sentinel trucks with solid rubber tyres, while horse-drawn vehicles carried pipes and other materials. As transport itself was a major hurdle, most materials had to be sourced from the site area itself.

A terrace was excavated on the hill above the Dam site, near the southern end. At this site, such things as mixer sheds, engine rooms, a general store for material, fitters' and blacksmiths' shops, carpenters' shops and a general office were established. A sawmill was set-up nearby which supplied timber, hauled to the site on wooden tramlines, and a quarry established to supply stone and gravel. Two steam-driven cableways, each with a 335 m span across the gorge, delivered concrete and other materials to the workforce. As there was no electrical power available at the site, most of the machinery operated in the construction of the Dam was steam or belt driven. The exception to this was a steam-driven electric generating plant, which was installed to drive the cement hoists and quarry track winches. Furthermore, an entire village was established during WWI at Wangat, near the Dam, to house construction workers and their families. At one stage more than 100 people populated the township, which consisted of houses, a boarding house and barracks for single men, shops and a dance hall.

The Dam itself was designed on a gravity section, curved in plan, with a radius of 1,200 feet at the upstream face. A shallow portion of the wall at the northern end of the structure was used as a spillway, and the whole of the Dam Wall was constructed of hundreds of interlocking units of cyclopean concrete. As each block was finished, the timber framework was raised, ready for the next until it reached its final height of 40 metres. Five 24-inch inlet valves were placed in the Dam Wall, spaced to enable the water to be drawn off at various levels. Each valve was positioned 17 feet above the next lower, and each was equipped with a coarse screen for keeping out fish and other foreign matter. A fine screening system was installed in the Valve House on the downstream side of the Dam. Two scour pipes were carried through the wall of the Dam, controlled by 36-inch needle valves. The Dam was also fitted with valves on the upstream side of the Dam for emergency purposes.

During construction, in the summer of 1921-22, some anxiety was felt that the requirements of the district would overtake available supplies from Walka before the completion of the Chichester Dam. However, the industrial depression in the district temporarily checked the rate of increase. After the suspension of construction in August 1920 due to a shortage of cement supplies, it was possible to recommence construction in August 1923, with full supplies of cement available from December of that year onwards. The whole of the concrete structure was completed with the exception of 1,000 cubic yards by 30th June 1925. With the storage of water having commenced in 1923, the full storage capacity was reached in 1925 with water flowing over the Dam spillway for the first time on 25th June. On 24th November 1923 the first water from Chichester was delivered to Newcastle as a partial supply.

A consequence of the introduction of Chichester water was that, as anticipated, the 1923-24 Annual Report noted an increased consumption, largely due to the softness of the Chichester water, as well as the removal of the restrictions that had existed under Walka Waterworks and the increased requirements of industries and trades. In regard to the softness of the water from Chichester, the Annual Report from 1924-25 predicted that demand would continue to rise for a period of time whilst the practice of conserving roof water was largely discontinued. The Chichester system, including the headworks and the gravitation main, was transferred to the Hunter District Water Supply and Sewerage Board in June 1925, by notification in the Government Gazette. In the wake of the completion of the Chichester works came many applications to Board for the extension of the water supply to outlying towns. Following the completion of the Dam an extensive programme was launched to remove the construction of the village and restore the area around the Dam. The formal ceremony for the transfer to the Board of the Chichester Catchment Area, Chichester Storage Reservoir, and Chichester Trunk Gravitation Main took place at Chichester Dam on 11th June 1927.

Flooding in the region in 1926-27 saw the discharge over the spillway of the Dam at one point reaching only 16 inches below the crest of the wall and caused considerable erosion of the banks adjoining the spillway channel below the Dam. The 36-inch wood pipeline below the Dam Wall was submerged. As such, the following year the Public Works Department launched a programme to ensure the protection of the banks adjacent to the spillway, which were eroded by the heavy floods. A concrete gauging weir was constructed for measuring the flow of the Chichester River below the Dam in 1927-28, and a considerable number of flowering shrubs and trees were planted around the Dam site this same year.

Not long after the first water from Chichester was delivered to Newcastle in November however, it became evident that the discharge capacity of the Gravitational Pipeline was likely to become insufficient within a few years. As such, at a meeting of the Engineering Experts Committee in 1928, it was recommended that a programme of water supply amplification works be implemented. Under this scheme, the first phase to be approved was the construction of pumping stations on the gravitation main at Tarro and Wiragulla. Further work was carried out in connection with the cleaning up of the area in the vicinity of Chichester Dam in 1929-30. Plantings of trees and shrubs also continued (and was to continue until the late 1930s), in addition to the erection of a boat shed to house a small launch purchased for patrolling of the storage basin, the improvement of the roadway in front of the No. 1 Quarters, and the removal of unsightly quarries. A construction shed was also moved to a position adjacent to the No. 1 Quarters and re-conditioned for use as a garage.

Also in 1929-30, the major valves at Chichester Dam received attention, with a gate valve being substituted for the needle valve in the downstream outlet Valve House and the downstream scour valve being overhauled and put into working order. A high lift duty water ram was installed at the Dam to do away with the necessity of pumping water for use by the Board's cottages and grounds by the more costly means of the old engine and oil pump. A spray fountain was also installed below the Dam for the purpose of aerating water let down the river when the flow was small, as complaints had been received as to the quality of the water drawn off from the lower levels of the Dam.

In the 1930-31 Annual Report it was announced that under a scheme of beautification submitted to the Board in the previous year, considerable improvements had been undertaken in the immediate vicinity of the Dam. These improvements included the grading and planting of banks above the roadway where a power station and boiler house stood during construction, the grading of the bank below the main road, and the construction of stormwater drains. A building, originally used during construction for a store and office, was also converted into a shelter shed for visitors, and beautified by means of trellises and vines.

Further alterations and improvements were made to the arrangement of the operation of the valves at Chichester Dam in 1930-31. These rearrangements reportedly made it possible to regulate the pressure in the pipeline from the valve at the Dam itself, thereby reducing the pressure on the wood stave pipes. It was hoped this would mean that maintenance costs on this section of the main could be reduced. In conjunction with this, an automatic alarm was installed at the Caretaker's Cottage to indicate when the pressure in the main fell below requirements. During shutdowns of the gravitation main in 1933-34 for maintenance purposes, the opportunity was taken to empty and clean the valve well at the Dam. The access ladders were also chipped and painted and the 36-inch outlet pipe through the Dam cleared of tuberculation and cement washed. A pressure screening system, which had commenced in 1932-33, was completed and put into operation on 10th October 1933.

In 1945-46 a protection wall between the Valve Houses at Chichester Dam was completed. From the late 1940s, water from Chichester was mixed with Tomago water at Waratah Reservoir. With the strengthening of the Tomago Sand Beds scheme in 1951, the sand beds assumed precedence of supply over Chichester Dam in 1951, 1952, 1953, 1956 and 1957. Since these years however, the delivery of water from Chichester was increased by completion of a gravitation main amplification.

Flash floods raised the level of water in Chichester Dam to record heights in 1963, resulting in concerns being raised as to the strength of the wall. It was discovered that Dams built in the same period of Chichester may not meet modern design criteria. Consequently, in the mid-1960s 150-millimetre drainage holes were drilled into concrete and underlying rock foundations, and the spillway was lowered by 2.71 metres in order to accommodate a large flood of about 1,000 years return interval through the creation of a greater spillway capacity. This post-tensioning of the Dam Wall and redesign of the spillway reduced the hydrostatic and uplift forces on the Dam, increasing safety.

Work commenced on 27th January 1967, and the spillway was cut down and gates installed in a position that retained the former top water level. The gates would automatically open in floods to permit a greater overflow than previously possible. The work had been recommended by a committee of senior engineers from the main NSW water supply authorities and was completed in the late 1960s.

In the wake of improvements to technology and investigations into Chichester Dam conducted in 1971 and 1972 however, the Board was able to approve a plan in the mid-1970s to restore the spillway to its original level, or a slightly higher level, thereby greatly increasing the capacity of the Dam. This scheme, outlined in the 1975-76 Annual Report, entailed the amplification of the capacity of the Dam through the construction of the spillway at two levels, the first to be 78 metres long and the second to be 70 metres in length. These conclusions were drawn following proposals made in 1970-71 for the strengthening and raising of the Dam Wall. The Board consequently engaged the Hydro-Electric Commission of Tasmania in October 1972 to make an examination, and in December 1972, the Commission reported favourably on the proposal. As such, they were asked to undertake the preparation of working drawings and specifications, which they submitted to the Board on the 23rd May 1973.

Three alternative proposals were given to the Board by the Hydro-Electric Commission and in May 1974, the Board approved the arrangement involving a longer, stepped spillway, as it was considered to involve less risk of Damage to the base of the Dam. As such, the Dam was closed for a number of years from 1979, as works costing $10 million were undertaken to raise and strength the wall via a system of steel cables. The work involved the demolition of 2,200 cubic metres of mass concrete on the crest, apron and Valve House, the relocation of the scour outlet works, and the construction of a new Valve House. The spillway was relocated towards the centre of the Dam, the width increased with a new profile to improve its hydraulic characteristics and its crest height restored to original level. The works permitted the capacity of the reservoir to be restored to the 22,000 ML which existed before the spillway was cut down for safety reasons in 1967. By 30th June 1983 the works were 50% complete and were effectively completed in May 1985. The Dam was then recommissioned on 25th May and re-opened to the public in June. Aside from modifications to the structure of the Dam, fluoride dosing equipment was also installed during this time, with modifications made to the equipment in 1970-71.

In 1999-2000 hydro-electric generators were installed at the Chichester Dam outlet and also on the trunk main just before the Dungog Water Treatment Plant. These were designed to generate electricity equivalent to the consumption of 195 homes between them.

Figure 2: The Dam Wall site, facing downstream with the quarry to the right, c. 1918

Source: Hunter Water Corporation Archives.

Figure 3: The quarry in use in 1919

Source: Hunter Water Corporation Archives.

Figure 4: The Dam Wall under construction, c.1919

Source: Hunter Water Corporation Archives.

Figure 5: Dam Wall construction, 1920

Source: Hunter Water Corporation Archives.

Figure 6: Dam Wall construction, 1924

Source: Hunter Water Corporation Archives.

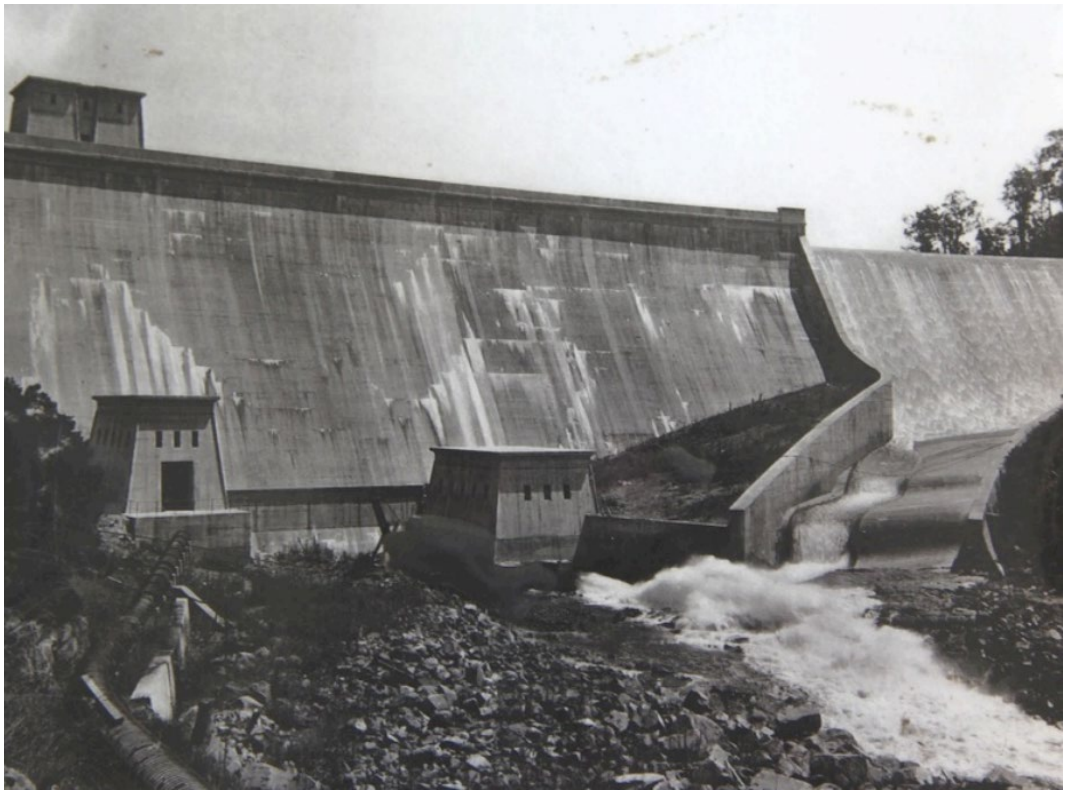


Figure 7: The finished Dam in 1927, as originally configured

Source: Hunter Water Corporation Archives.

HERITAGE STATUS

Listing Details	☒ S170 Heritage and Conservation Register ☐ Local heritage listing ☐ State heritage listing
Conservation Management Plan	☒ Futurepast Heritage Consulting Pty Ltd, 2012, *Conservation Management Plan – Chichester Dam Site*, prepared for Hunter Water Corporation
Heritage Asset Action Plan	☐ N/A
Aboriginal Sites Registered within the Site	AHIMS search undertaken on 12 July 2023 for the asset curtilage with a 50 metre buffer. No Aboriginal sites were registered within the search area.
Historical Archaeological Potential	The 2012 CMP states: *Archaeological remains are potentially located in two areas:* • *The Construction Village Precinct; and* • *The Sawmill Site in the Lower Dam Precinct.* *Both of these sites have the potential to reveal information regarding the construction of the Dam and the living and working conditions of those involved in the construction or their families. In both cases, the sites are presently quite overgrown and inaccessible, so were not able to be surveyed. The extent and condition of any archaeological materials remains uncertain, however, these areas should be considered sensitive unless proven otherwise.* *As neither site is under any threat, there is no urgency to undertake a detailed field investigation at this stage. If, however, works are proposed in those locations, then the area(s) should be subject to further field assessment to determine the likely survival of archaeological deposits.* Based on the above, Chichester Dam is considered to have historical archaeological potential in association with two discrete areas. Please refer to **Figure 10**.

HERITAGE SIGNIFICANCE

Level of Significance	State
Statement of Significance	Chichester Dam was the first (c. 1917-1926) large-scale water storage facility constructed in the Hunter Valley. Designed to supplement and ultimately replace the earlier schemes which pumped water from the Hunter River, the Chichester Dam was the largest public engineering work in the region and provided a reliable source of water to Newcastle and the various towns and villages around the Hunter Valley. The Dam represents an evolution in water supply technology in the area, replacing earlier localised storage and pumping schemes with a major reliable water source which served the Hunter region for half a century before being supplemented by the Grahamstown Scheme. Components of the Dam such as the Upper and Lower Valve House demonstrate a good aesthetic sense through their Egyptian Revival detailing. The Dam complex includes several cottages surviving from the construction phase of the Dam, as well as archaeological evidence in the form of the former quarry and the remains of the construction village.

NSW SHR Criteria

- ☒ a) Historical
- ☐ b) Associative
- ☒ c) Aesthetic / Technical
- ☐ d) Social
- ☒ e) Research Potential (yield new information)
- ☒ f) Rare
- ☐ g) Representative

Significant Elements

The following elements are graded in the 2012 CMP as being of considerable (high) or exceptional significance. The elements are categorised into Precincts identified within the CMP. Reference should be made to the CMP for a complete list of significant elements.

Dam Entrance Precinct

- Sandstone entrance pillars.
- No. 1 Quarters (see **Addendum 1**).
- Chichester Dam Office (No. 3 Quarters) (see **Addendum 2**).
- Mal Hindley Memorial Pillar.

Dam Wall Precinct

- Dam Wall.
- Upper Valve House.
- Lower Valve House.
- Pipeline.
- Plaque collection.

Lower Dam Precinct

- Duncan Park Memorial.
- Cipoletti Weir and Gauging House/Hut (see **Addendum 3**).
- Former sawmill site (archaeological site).

Depot Precinct

- Quarry face.
- Post-tensioning samples.

Construction Village Precinct

- Former construction village (archaeological site).

DESCRIPTION

Setting

The Chichester Dam site is located approximately 20 kilometres north of Dungog, in a rural area on the western edge of the Barrington Tops National Park. The area around the Dam consists of hilly, largely cleared farmlands to the south and west, with more mountainous and densely forested land to the north and east.

External Appearance

Chichester Dam is a large, mass concrete Dam built between 1917 and 1926. The Dam is fed by the Chichester and Wangat Rivers, has a storage capacity of 21,500 megalitres and is slightly arched towards the upstream side for structural reasons. The lake behind the Dam is used for potable water storage only and is not open for swimming, boating or other recreational uses.

The Dam discharges into the Chichester River and water is taken off through a cast iron gravitation main located at the base of the Dam Wall. The Chichester Dam complex includes the Dam Wall, the Upper and Lower Valve Houses, the Cipoletti Weir, the office (another former workers' cottage), the No. 1 Quarters (now a guest house), a depot located within the former quarry and the archaeological site of the former construction village. There are also a range of modern picnic amenities, including a toilet block, barbecues and picnic shelters which are not significant.

Within the CMP available for the Dam, the overall site has been separated into distinct precincts that relate to function and configuration, as described below. The descriptions below are limited to a consideration of buildings/elements that have been identified as having heritage significance.

For a more complete description of the Dam and all component elements (irrespective of significance), see the 2012 CMP.

1. Dam Entrance Precinct
2. Dam Wall Precinct
3. Lower Dam Precinct
4. Depot Precinct
5. Upper Picnic Precinct
6. Construction Village Precinct.

<u>Dam Entrance Precinct</u>

The Dam Entrance Precinct extends from the Entrance Gates to the Chichester Dam site through to the upper level of the Dam site.

Sandstone entrance pillars

A pair of sandstone entrance pillars marks the entrance to the Chichester Dam site. There is signage on the pillars, however, one sign is missing on the right-hand pillar, which also exhibits vehicle Damage. The sandstone pillars appear to be original to the site.

Photo 1: View of the western entrance pillar

Source: Futurepast 2012

No. 1 Quarters

See **Addendum 1.**

Photo 2: View of the eastern (left) and western (right) buildings

Source: Umwelt 2022

Chichester Dam Office (No. 3 Quarters)

See **Addendum 2**.

Photo 3: Principal (northern) façade of the building

Source: Umwelt 2022

Mal Hindley Memorial Pillar

The Memorial Pillar is located within the Mal Hindley Memorial Park, which is a flat, grassed area below the No 1 Quarters. The Memorial Pillar is concrete and was installed in recognition of Hindley, who was Chief Engineer with the Board from 1966-1976 and Chief of Engineering Operations and Services from 1976-1982. It features a bronze plaque with an Institution of Engineers bronze logo above. The Memorial has a Damaged base.

Photo 4: Memorial to Mal Hindley located within the Mal Hindley Memorial Park

Source: Futurepast 2012

Dam Wall Precinct

The Dam Wall Precinct includes the Dam Wall and its immediate environs. Mostly this consists of operational parts of the site, with remnants and evidence of previous alterations and operational structures. In addition, there are a number of commemorative and interpretive plaques.

Dam Wall

The Dam Wall is a cyclopean concrete wall with later spillway alterations. It has been altered and changed in several instances, including being both lowered and raised, with evidence of this in the changing colour and concrete style of the wall. The Dam Wall shows evidence of old surface cracks, discolouration and alteration, including the installation of several metal clad conduits down the Dam face.

Photo 5: Elevated view of the Dam Wall

Source: Umwelt 2022

Photo 6: Lower view of the Dam Wall

Source: Umwelt 2022.

Upper Valve House

A mass concrete Egyptian Revival style structure, the Upper Valve House has balconies to the northern and western sides, with later timber and colourbond awnings. There are two marble and one bronze plaques on the eastern face of the structure and entry is obtained on the southern side. There have been alterations to the roof drainage and an access hatch has been cut into the roof to allow the installation of new valves. The entrance to the Upper Valve House was originally via a central doorway from the Dam Wall, however, with the raising of the wall, a new staircase was constructed to an altered opening in the south side of the building.

Inside, there are three pits with cast iron floor plates and five valve stems, a modern overhead crane to lift stopboards into one of five slots and a modern steel gantry and ladder. There is modern steel mesh over the doors and a mesh cage around the eastern balcony. Many of the lights and conduits are surface-mounted and the front door and windows were infilled when the Dam Wall was raised.

Photo 7: External view of the Upper Valve House

Source: Umwelt 2022

Photo 8: Internal view within the Upper Valve House

Source: Umwelt 2022

Lower Valve House

The Lower Valve House (originally designated the Outlet Valve House) is a mass concrete structure, built in the form of a truncated pyramid with a flat roof. The concrete is off-form, with vertical form marks and pouring joints. The walls are about 1,500 millimetres thick at the base. There are five window openings on the southern side, and three on the eastern side. All the windows are covered with later unsympathetic plastic panels. There is a personnel doorway in the southern wall and a double doorway in the eastern wall. Both of these have modern steel mesh doors. Just to the south of the building is a valve pit.

The interior of the Lower Valve House is one large off-form concrete space, painted white. There is a relatively recent Anderson grid steel flooring, and an overhead platform at the western end. An old gantry supports a modern crane and there are two valves, marked *HDWS&SB, 30" Sydney*, which are now electrically operated.

Photo 9: External view of the Lower Valve House

Source: Umwelt 2022

Photo 10: Internal view within the Lower Valve House

Source: Umwelt 2022

Pipeline

The pipeline in the Dam precinct consists of a welded steel 42-inch (1.08 metre) pipe, painted silver, supported on cast-in-situ concrete footings with precast concrete saddles. At intervals, the pipe is surrounded by a double arched concrete support structure. This pipeline replaces an earlier pipeline that was constructed in timber.

Photo 11: View of the pipeline in relation to the Lower Valve House and Dam Wall

Source: Umwelt 2022

Plaque Collection

At the level of the Dam Wall are a series of plaques, some of which date from the original construction of the Dam, while others commemorate more recent events. There is a bronze plaque and two marble plaques on the east face of the Upper Valve House, while on the side face of the Dam Wall are two modern bronze plaques.

Photo 12: The Memorial (front and back views)

Source: Umwelt 2022

Photo 13: One of two marble plaques commemorating the handover of the Dam to the Hunter District Water Board in 1925

Source: Umwelt 2022

Photo 14: Bronze plaque commemorating Christopher King

Source: Umwelt 2022

Photo 15: Plaque commemorating the opening of the hydro-electric plant in 2000

Source: Umwelt 2022

Lower Dam Precinct

The Lower Dam Precinct includes Duncan Park and its various elements, Cipoletti Weir and associated infrastructure and the site of the former sawmill. The Precinct consists of a mix of recreational and operational elements, as well as containing evidence of previous operational activities and a memorial.

Duncan Park Memorial

The Duncan Park Memorial is a vertical Art Deco style sandstone memorial, about 2. 5 metres high, with green enamelled bronze letters to the back. The memorial includes a working water fountain on the reverse side, with a bronze plaque above the bubbler. The dedication is made to FK Duncan, a former Board president, and Sir Roden Cutler unveiled it on 26th October 1968.

The pointing is in poor condition and the blocks are beginning to separate. There is some lichen staining and water ingress at the top. The plinth is cracked and displaced in several locations. The lettering is dulled but otherwise is in good condition.

Photo 16: The Memorial (front and side views)

Source: Umwelt 2022

Cipoletti Weir and Gauging House/Hut

See **Addendum 3**.

Photo 17: The Weir as viewed from the adjacent walkway

Source: Umwelt 2022

Photo 18: Gauging house/hut, Weir and walkway

Source: Umwelt 2022

Former sawmill site (archaeological site)

On the north bank of the river, just opposite Cipoletti Weir, was a sawmill that produced cut timber for use during works. A photo from 1919 shows the mill just uphill from the weir and a timber tramway running along the north side of the river. Poor access to the site (vegetation, topography and lack of clear access tracks) means that the area has not been able to be subject to detailed inspection, however there is some potential for remains of the mill operation and/or the timber tramway to survive.

Figure 8: The sawmill in 1919

Source: Futurepast 2012

Depot Precinct

The Chichester Dam Depot is situated within the former quarry cut into the hillside above the south side of the Dam Wall. The quarry supplied aggregate for the preparation of concrete for the Dam. The Depot Precinct contains the Dam's works and storage depot, consisting of three main buildings, five shed structures and various ancillary items and pieces of equipment scattered around the site. The depot is enclosed with a chain wire fence with gates at either end. Along the base of the quarry wall are three test installations for the post-tensioning cables used on the Dam Wall.

Quarry face

The former quarry face rises about 15 metres above the depot and is surmounted with regrowth vegetation. A series of timber power poles runs along the top of the quarry wall, with a line running down to a pole transformer at the depot. The quarry was originally excavated to supply stone for the concrete of the Dam Wall. The stone was transported from the quarry via an overhead cableway. No evidence of the cableway survives.

Photo 19: View of the quarry face with one of the post-tensioning samples visible at ground level

Source: Umwelt 2022

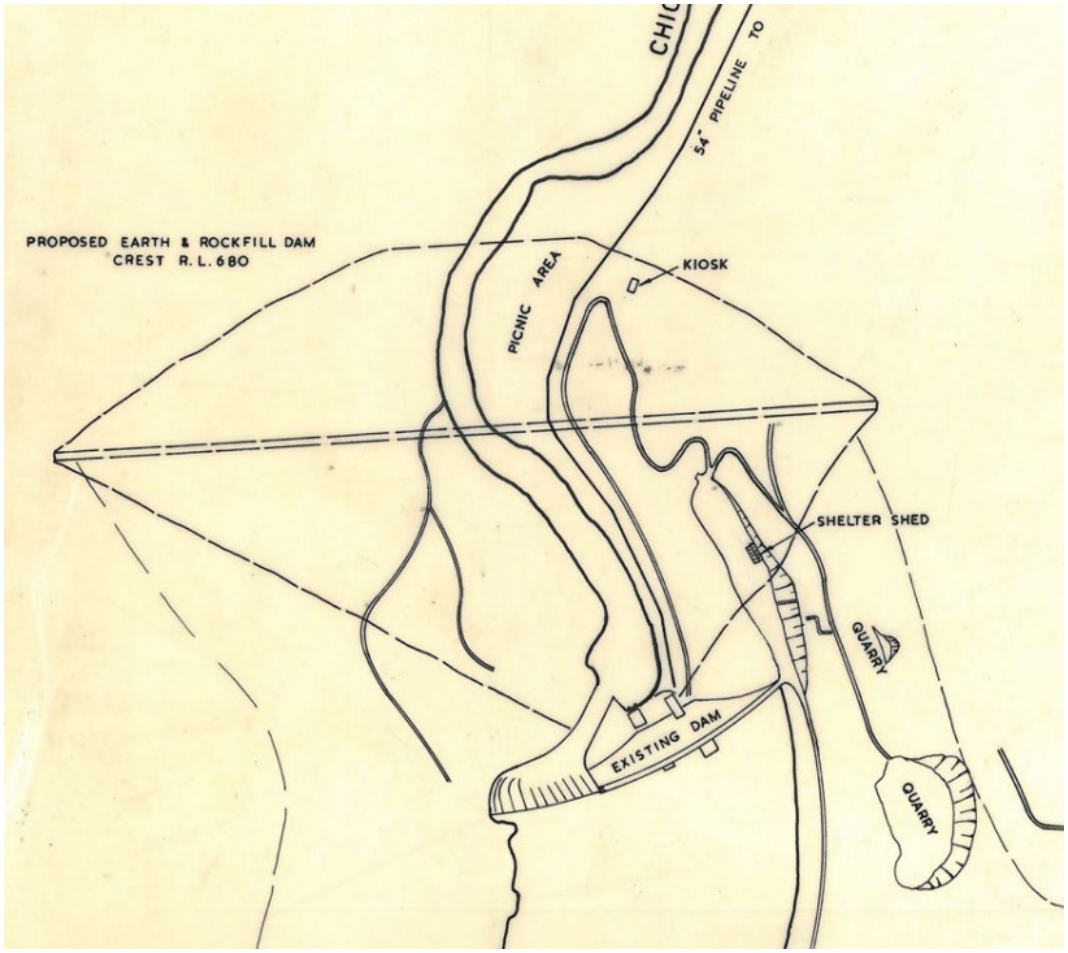


Figure 9: Extract from a 1967 plan of the site showing a proposed new Dam that was never built. The larger quarry is the present Depot

Source: Hunter District Water Board Plan 2317, dated 15 December 1967

Post-tensioning samples

There are three samples of the post tensioning system installed in the Dam Wall. These are all located near the base of the quarry face and give an opportunity to examine the details of the post tensioning system installed in the Dam Wall.

Photo 20: One of the Post-tensioning samples within the Depot Precinct

Source: Umwelt 2022

Upper Picnic Precinct

The Upper Picnic Precinct is located just east of the Depot Precinct and consists of a flat bitumen carpark area at high level with picnic equipment, a series of concrete stairs leading down to the Dam Wall via a survey point and lookout, as well as a winding roadway leading down to the top of the Dam Wall. Along this road are two toilet blocks and the former Caretaker's Office. At the level of the Dam Wall crest is another grassed area with picnic equipment.

No elements graded considerable (high) or exceptional significance are located within this Precinct. However, elements graded as having some or little significance are located in this area. Reference should be made to the 2012 CMP.

Construction Village Precinct

Located on the hill opposite No 3 Quarters and south of the reservoirs, the former Construction Village Site has revegetated and in some areas is heavily overgrown with weeds, which limit access and visibility.

Former Construction Village (archaeological site)

The hill opposite No 3 Quarters was the location of the main construction village. A photo from 1918 shows at least 42 timber buildings on the site, mainly small houses, and rows of at least 30 tents running behind the houses. Typically, in these villages, the buildings were demountable, rather than constructed on site, and were moved around as required. Tents were generally accommodation for single men, while houses were for more senior staff with families.
When works ceased, villages were typically dismantled and the buildings transferred to other sites or sold.

The significant growth of lantana has restricted access to the former village site in its entirety. However, *in situ* archaeological remains of the village are present within cleared areas. This includes footings, stairs, and remnant building materials. Other features that may be present and discernible include street and drain layouts, toilet pits, rubbish dumps, occupational deposits, etc. The living conditions of village residents are an important element of the site's history, which should be interpreted.

Photo 21: Remnant stairs within the former Construction Village

Source: Umwelt 2022

Photo 22: Example of a bottle fragment identified at the former Construction Village

Source: Umwelt 2022

Photo 23: Example of typical remnants present at the Former Construction Village

Source: Umwelt 2022

Figure 10: Historical photograph of the former Construction Village

Source: Futurepast 2012

Overall Condition

Fair to very good.

For further information regarding the No. 1 Quarters (**Addendum 1**), the Chichester Dam Office (**Addendum 2**) and the Cipoletti Weir (**Addendum 3**), please see addendum sheets. For further information regarding other significant elements associated with the Chichester Dam, please see the 2012 CMP.

Moveable Heritage Objects	• A significant number of moveable heritage items are associated with Chichester Dam. Reference should be made to the 2012 CMP. It should also be noted that a Moveable Heritage Register is recommended to be developed for this and other assets of heritage significance within the Hunter Water Corporation portfolio.

MANAGEMENT

Approval and Assessment Requirements	Minor or inconsequential impacts: Anything other than routine repair and maintenance must be discussed with the Environment Team to determine the level of heritage assessment required. More than minor or inconsequential impacts: As above. Reference should be made to the most up to date CMP for this asset as part of any works planning, in recognition of its State significance. Additionally, consultation with the relevant local council is required. Demolition or removal from the register requires consultation with Heritage NSW and archival recording.
General / Ongoing Management	• Changes within the defined curtilage should be preceded by the appropriate level of heritage assessment and approval. Advice and/or confirmation should be sought from the Environment Team prior to undertaking any works. • Maintain overall configuration and setting of the Dam, associated land and significant elements. • Changes to fabric may be supportable if no feasible alternative is available to ensure ongoing operation and/or safety. • Replacement/removal of redundant or failing elements or equipment is acceptable. Any replacements must be appropriate/sympathetic. • Removal of non-significant elements (such as contemporary services and fit-out) is supportable. Any replacements must be appropriate/sympathetic. • Undertake review of and update the applicable CMP every 5–7 years. The current CMP requires updating. • The policies contained within the CMP should be followed to conserve and manage the heritage values of the asset in line with the operational needs of Hunter Water. • Consider nominating Chichester Dam (as a whole) for listing on the LEP and NSW State Heritage Register. • Consider the preparation of a Heritage Asset Management Plan (HAMP) or an update to the existing Conservation Management Plan (CMP) for the entirety of Chichester Dam.
Priority Conservation Works	• Refer to the 2012 CMP in the first instance. • Develop a Schedule of Conservation Works for the Dam and its component elements consider the preparation of a Cyclical Maintenance Plan. • Undertake a comprehensive structural and condition assessment of the buildings with consideration given to termites, water damage, structure and contamination/asbestos. • Check over and repair/replace rainwater goods and stormwater drainage connections to all buildings/structures. Treat mould/water Damage as encountered. • Re-paint painted surfaces throughout the Dam; utilise suitably qualified and experienced tradespeople. • Check over/investigate all concrete and brickwork throughout the Dam and stabilise and repair as required. • See **Addendums 1, 2** and **3** for information relevant to the No. 1 Quarters, Chichester Dam Office, and Cipoletti Wier, respectively.

Image 1: View of the Dam

Image 2: View of the Upper Valve House and top of the Dam Wall

Image 3: View along the top of the Dam Wall

Image 4: The Mal Hindley Memorial Park

Image 5: View of the Depot Precinct showing the quarry and buildings

Image 6: View of the Dam Wall

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- Futurepast Heritage Consulting Pty Ltd, 2010, 'Hunter Water Conservation and Heritage Register Study'.
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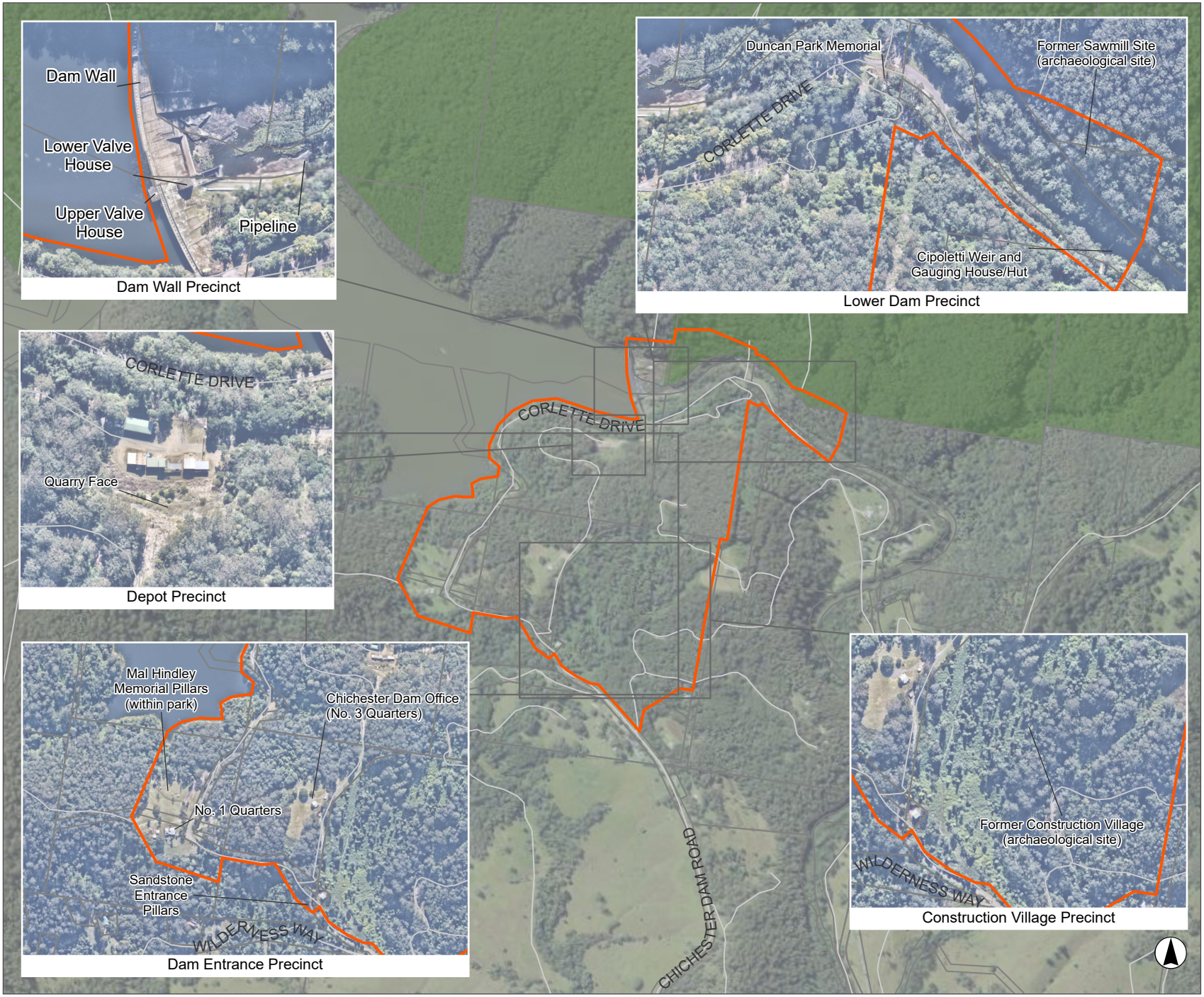
- John W Armstrong 1967, Pipelines and People. The History of the Hunter District Water Board Newcastle, New South Wales. Publisher: The Hunter District Water Board, Newcastle.
- Mal Hindley 1983, 'From Weirs, Dams and Sand', in Shaping the Hunter. Publisher: The Newcastle Division of the Institute of Engineers Australia, Newcastle.

FIGURE 1

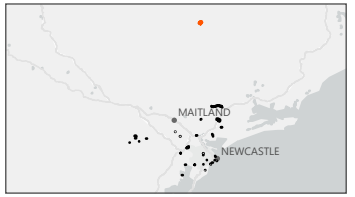
S170 Review - Heritage Curtilages



Legend

- Road
- Railway
- Lot Boundary
- Heritage Curtilages
- NPWS Reserve

Chichester Dam



Scale 1:15,000 at A4

GDA 1994 MGA Zone 56

Image Source: ESRI Basemap (2022) **Data source:** NSW DFSI (2022)