Description:
Site consisting of two large buildings; a pumping station and a screening building, as well as a small building between these two which previously functioned as the original blacksmith's shop. The site is located adjacent to presently functioning works.

The pumping station building is a two storey rendered masonry building with rendered concrete awnings over doors and windows, decorative rendered sills, timber windows and framed and sheeted doors. The roof is timber framed with asbestos sheeting and slatted timber eaves, and is in fair condition. The louvered vent at the top of the face has been waterproofed/sealed. Inside is a sewage pumping station with a dry well and original pumping gear and equipment. In one corner, is a foreman's office.

The pumping station building is connected by a tunnel to the screening chamber.

The screening chamber building is similar in style to the pumping station building, however is in much poorer repair, and the roof has collapsed. Inside, are two large rotating circular screens which feed to the outfall. Outside, are copper rain heads and square section downpipes remain. At top of face are timber louvered vents.

The modern treatment works, which are not significant and date from the 1990s, are located between the old plant and Burwood Beach.

Significance:
Burwood Beach Wastewater Treatment Plant was the first major sewage treatment plant located in the Newcastle area. It was constructed amidst growing recognition of the need to more effectively treat and dispose of Newcastle's sewage and provided primary level treatment of waste. The works were housed in the two attractively designed reinforced concrete buildings. After screening, the waste was pumped to an outfall at the beach, later replaced with a deep water outfall. The remains of the original plant demonstrate both that initial concern to improve public health within the Newcastle area as well as the sense of civic pride which was brought to public infrastructure through the fine detailing of the buildings. While decommissioned and in generally poor condition, the buildings are also rare in that they retain the bulk of the pumping and screening equipment associated with the original plant.

Historical Notes:
Burwood Beach Wastewater Treatment Works were completed by the Public Works Department (and local government) in 1936, with the Board assuming control on the 9th March 1936. The works were constructed to replace the very unpopular Merewether Outfall, which formed part of the original sewage system for Newcastle, and which was endorsed in 1901. After the Merewether Outfall was plugged in 1917 as a result of growing public protest, it was replaced by a new outlet, which discharged the sewage underwater. This new system however, was to prove equally unsatisfactory. As such, the Board resolved that a sewage treatment works should be constructed in the suitably remote area south of the Merewether Ridge, in Riley's Paddock at Burwood Beach, then known as Murdering Gully. The amplification scheme was prepared by the Expert Engineers' Committee, and embodied the construction of a major sewage treatment works at Murdering Gully, a pumping station at Merewether, a one-mile rising main between the works and the pumping station and a 4-mile intercepting sewer from Merewether Pumping Station across Glebe, Adamstown, Broadmeadow and Waratah to Mayfield. The Burwood Beach Wastewater Treatment Works were designed to pump and screen the whole of the sewage from the Newcastle district, with the solid matter removed and buried in the vicinity, whilst the liquid and fine solids gravitated to the ocean.

In 1927, the Public Works Department purchased 443 acres of land at Murdering Gully from the Trustees of the late E.C. Merewether. The land had a 4 000 foot ocean frontage, and at the northern end the cliffs sloped down onto a sandy beach, which continued southwards to within 1000 feet of Glenrock Lagoon, the southern boundary of the acquired land.

The pumping station at the Burwood Beach Wastewater Treatment Works was constructed in the form of a circular concrete shaft, 32 feet in diameter and approximately 50 feet deep. In this concrete shaft 7 vertical spindle electrically operated centrifugal pumping units and switch-gear were installed. The sewage storage wells, which were also the
pump suction wells, were located around the pump well. These storage wells were divided into two sections, with one section receiving the flow from the main Intercepting Sewer, and the other the flow from the Merewether Diversion Sewer.

Four pumping units with a total horse power of 490 and total nominal capacity of 90 cusecs provided for pumping from the intercepting sewer. Three pumping units with a total horse power of 205 and total nominal capacity of 43 cusecs were provided to pump the effluent from the diversion sewer from Merewether.

A substantial concrete building was constructed over the pump well, and housed the Newcastle Electric Supply Department’s transformer equipment for the electric supply to the works.

The sewage matter received from the incoming sewers was pumped from the storage wells to either or both of the screening plants, as was required. Each of the two screening plants consisted of coarse and fine screens. The coarse screens were made up of grids of inclined mild steel bars, spaced 2 inches apart, through which the sewage matter had to pass before reaching the fine screens. Any solids caught on these coarse screens were raked away. The two fine screens consisted of revolving inclined mild screening tables, circular in shape, the surfaces of which consisted of brass plates with numerous 1/16 inch slots. The sewage matter ran on to the screens at the lowest point, with the liquid matter passing through the slots. The solids were caught on the plates however, and, as the screen revolved, were brought into the path of revolving brushes carried on rotating frames and swept into elevator pits. From here, the solid matter was elevated to hopper trucks, which would take them away for burying. The fine screens were housed in a concrete structure conforming in appearance to that over the pumping plants. The effluent pipe for conveying the liquids to the ocean was of substantial construction, particularly at the outlet and where it is subject to wave action. This latter section consisted of 48 inches internal diameter flanged cast-iron pipes secured to reinforced concrete piles by steel bands. In order to ventilate the two main sewers draining to the wells, two 36-inch exhaust fans were installed as an integral part of the outfall works.

Pumping operations commenced on 12th February by the Constructing Authority, the Department of Public Works and Local Government, and on 9th March the responsibility for operation was passed to the Board. The intercepting sewer was brought into use on 1st September 1936.

In the 1936-37 Annual Report it was noted that the grounds of the Burwood Beach Wastewater Treatment Works were gradually being brought into order. Furthermore, in this same year, installation of ventilation equipment, including suction fans, was completed and put into operation. As a result of this, the ventilating shafts at Empire Park and Gibson Street, among others, were sealed off. In 1939-40 a boiler house was constructed at the Burwood Beach Wastewater Treatment Works.

It was also reported in 1936-37 that the Burwood Beach Wastewater Treatment Works had successfully prevented, during the past year, the pollution of the adjacent beaches, with regular inspections having been made. At that time, the solids obtained from the coarse and fine screen were buried in trenches, excavated for that purpose, adjacent to the pumping station.

A number of conferences regarding the discharge of sewage effluent into the ocean from the Burwood Beach outfall works were held in 1967-68 with the Department of Public Health. Consequently, in 1968-69, the Board commissioned civil and structural engineers to make a special investigation into the feasibility and relative merits of works were held in 1967-68 with the Department of Public Health. Consequently, in 1968-69, the Board commissioned civil and structural engineers to make a special investigation into the feasibility and relative merits of

In the 1974-75 Annual Report it was announced that the Board was still planning the construction of these works. Whilst it was reported in 1975-76 that these investigations and designs were nearing completion, the 1976-77 Annual Report announced that work on the Burwood Beach Wastewater Treatment Works had been deferred pending the availability of funds.

In 1981-82 it was announced that as the Burwood Beach system was falling well below modern standards, investigations were proceeding for construction of a deep ocean outfall, as well as the upgrading of treatment processes so as to remove gross solids, floatables and greases more effectively. According to the report, the construction of these upgrades would commence when the funds were available. In 1982-83 however, it was announced that focus was shifting from the construction of a long offshore tunnel, to the investigation of alternatives to the traditional ocean outfall solution. As such, the operation of the sewage transport system that fed Burwood Beach was being thoroughly examined.

In 1984-85 it was reported that an upgrade in two stages had been approved by the Board to amend the overloaded and inadequate sewage treatment facilities at Burwood Beach. The construction of the programme was to take five years, with stage one including the construction of an ocean outfall and preliminary treatment facilities, including the
amplification of the pumping station, and stage two seeing the construction of a secondary treatment plant. The contract for the construction of the ocean outfall, including a shaft, tunnel and diffuser, had been awarded to the Sydney-based firm Roberts Construction Limited in September 1985, with the completion of works scheduled for June 1987.

Tunnelling and marine works were completed by 1987-88. Stage One works were carried out by the contractors Barclay Brothers, and was commissioned on 26th May 1989. Stage Two, the construction of a new administration building, new preliminary treatment facilities and a new pumping station was commissioned in December 1989. At this time, the old screening plant and pumping station were decommissioned. The removal efficiency of the new screens was remarked in the 1989-90 Annual Report to have been substantially higher than the old plant, and the hydraulic capacity twice that of the old plant.

Stage Three of the upgrade was commenced in 1988-89 following successful pilot plant testing and the commencement of detailed concept design and layout. This stage consisted of the construction of a new secondary treatment plant.

Stage Four of the programme comprised the identification of the infiltration and inflow points into the sewerage system and the rectification of these where economically viable. It also included other system changes to eliminate wet weather overflows. Equipment was obtained for flow measurement in sewer mains and analysis of storm flows begun to highlight system weaknesses in 1988-89.

The Burwood Beach Secondary Treatment Plant was finally commissioned in June 1992. However, after odours from the biofilter were judged to be at an unacceptable level, the biofilter was taken off line. Tenders were called by a cover, ventilation system and odour control equipment, with the contract awarded in September 1994. Following commissioning tests, the biofilter was recommissioned in April 1994.

In February 2009, work began, once again, on the first stage of an upgrade to Burwood Beach Wastewater Treatment Works. These works consisted of an upgrade to the odour control capacity of the facility. A new biofilter was to be installed, which would comprise a bed of specially designed organic matter, including shredded wood, bark chips and either compost or peat to treat the odorous air.

**Designer/Builder:** Public Works Department/Newcastle Council

**Current Use:** Decommissioned

**Former Uses:** Wastewater Treatment Works

**Physical Condition:**

The Pumping Station Building is in fair condition, whilst the Screening Building is in very poor repair.

**Recommended Management:**

- This item contributes to local character and should be conserved.
- Original details should be maintained including doors, windows and original signage.
- New materials should be sympathetic to the nature and character of the original building.
- In the event of major proposed changes, prepare a Conservation Management Strategy and undertake an archival recording.
- Wherever possible, changes should be restricted to the interior of the building.
- Routine maintenance of existing fabric is essential.

**Specific Recommendations:**

1. Recommended Management Prepare a maintenance schedule or guidelines
2. Recommended Management Document and prepare an archival record

**References:**


Department of Public Works , Annual Reports, 1888 to 1892 and 1893-94 to 1960-61.


Hunter District Water Supply and Sewerage Board , Annual Reports, 1897-98 to 1937-38.


Hunter Water S170 Register


Studies:
1. Futurepast Heritage Consulting Pty Ltd 2010, ‘Hunter Water Conservation and Heritage Register Study’. Reference:

Listings:
1. Heritage Act - s.170 NSW State agency heritage register:
   Listing date: . Reference Number:

Data Entry: Date First Entered: 26/Apr/2010  Date Updated: 10/Sep/2010  Status: Partial
Burwood Beach Wastewater Treatment Works

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Burwood Beach Wastewater Treatment Works - Historic plan of phases of treatment (Courtesy of John W. Armstrong, "Pipelines and People")

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